Initial Study/Environmental Checklist

Watsonville Lee Road Trail

December 2020

Prepared for:

County of Santa Cruz
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County of Santa Cruz

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CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)
INITIAL STUDY/ENVIRONMENTAL CHECKLIST

Date:	December 17, 2020	**Application Number:**	201188
Project Name:	Lee Road Trail	**Staff Planner:**	Randall Adams

I. OVERVIEW AND ENVIRONMENTAL DETERMINATION

APPLICANT:	City of Watsonville	**APN(s):**	018-281-63; 018-391-02; 018-392-01; 052-082-02; 052-091-41; 052-221-17; County and City Road ROW
OWNER:	City of Watsonville	**SUPERVISORAL DISTRICT:**	2 and 4

PROJECT LOCATION: The project is located along Lee Road, which extends through the City of Watsonville and unincorporated Santa Cruz County on the west side of Highway 1 (**Figures 1 and 2**). Santa Cruz County is bounded on the north by San Mateo County, on the south by Monterey and San Benito counties, on the east by Santa Clara County, and on the south and west by the Monterey Bay and the Pacific Ocean.

SUMMARY PROJECT DESCRIPTION:

The City is proposing the Lee Road Trail Project (project) as shown in **Figure 2**. The 1.4-mile-long trail would generally be a 12-foot-wide pedestrian/bicycle trail along the east side of Lee Road, with a 12-foot-wide pedestrian/bicycle bridge over the portion of Lee Road extending through (and submerged by) Struve Slough. Additionally, portions of the trail would extend along Harkins Slough Road on the north end to the high school, along the west side of Lee Road south of Struve Slough, and along the unpaved path located on the north side of Watsonville Slough to existing trails on the east side of Highway 1.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: *All of the following potential environmental impacts are evaluated in this Initial Study. Categories that are marked have been analyzed in greater detail based on project specific information.*

- ☒ Aesthetics and Visual Resources
- ☒ Agriculture and Forestry Resources
- ☒ Air Quality
- ☒ Biological Resources
- ☒ Cultural Resources
- ☐ Energy
- ☒ Geology and Soils
- ☐ Greenhouse Gas Emissions
- ☒ Hazards and Hazardous Materials
- ☒ Hydrology/Water Supply/Water Quality
- ☐ Land Use and Planning
- ☐ Mineral Resources
- ☒ Noise
- ☐ Population and Housing
- ☒ Public Services
- ☒ Recreation
- ☒ Transportation
- ☒ Tribal Cultural Resources
- ☒ Utilities and Service Systems
- ☐ Wildfire
- ☒ Mandatory Findings of Significance

DISCRETIONARY APPROVAL(S) BEING CONSIDERED:

- ☐ General Plan Amendment
- ☐ Land Division
- ☐ Rezoning
- ☐ Development Permit
- ☐ Sewer Connection Permit
- ☒ Coastal Development Permit
- ☒ Grading Permit
- ☒ Riparian Exception
- ☐ LAFCO Annexation
- ☒ Other: Encroachment Permit

OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED (e.g., permits, financing approval, or participation agreement):

Permit Type/Action	Agency
Clean Water Act 404 Compliance	U.S. Army Corps of Engineers
Clean Water Act 401 Compliance	Central Coast RWQCB
Construction General Permit/SWPPP	State Water Resources Control Board
Streambed Alteration Agreement 1600 Permit	California Department of Fish and Wildlife
Section 7 Compliance	U.S. Fish and Wildlife Service
Coastal Development Permit	County of Santa Cruz

CONSULTATION WITH NATIVE AMERICAN TRIBES: *Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?*

No California Native American tribes traditionally and culturally affiliated with the area of Santa Cruz County have requested consultation pursuant to Public Resources Code section 21080.3.1. However, in accordance with Santa Cruz County Ordinances (SCCC Chapter 16.40), Native American outreach was conducted because of a known cultural resources site in the project area.

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 or agreed to by the project proponent, including required mitigation measures (**Attachment A**). A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Matt Johnston, Environmental Coordinator	Date

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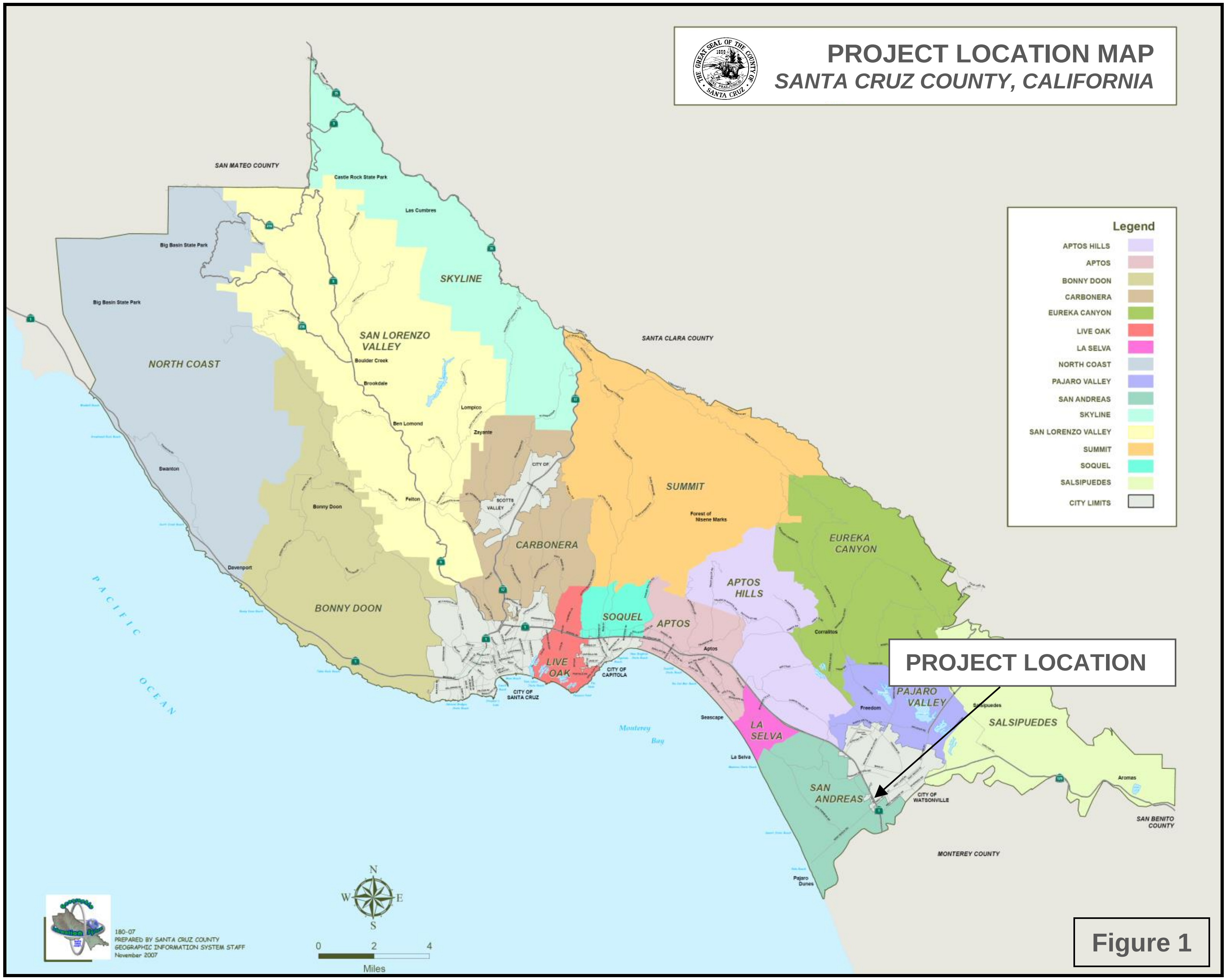

Figure 1. Project Location

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Source: County of Santa Cruz Imagery 2016.

Harris & Associates

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0 400 800

Feet

Figure 2

Lee Road Trail Overview

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II. BACKGROUND INFORMATION

EXISTING SITE CONDITIONS:

Parcel Size (acres):	Not applicable. Project is linear, 1.4-miles long, extending through and alongside several properties, paved roadway, unpaved path, and over Struve and Watsonville Sloughs.
Existing Land Use:	Undeveloped open space and paved roadway, and unpaved path
Vegetation:	Disturbed ruderal uplands/non-native grassland, non-native forest, coastal scrub, wetlands, riparian.

Slope in area affected by project: ☒ 0 - 30% ☐ 31 – 100% ☐ N/A

Nearby Watercourse:	Struve Slough, Watsonville Slough
Distance To:	Struve Slough and Watsonville Slough are within the Project area and are tributaries to the Pajaro River near the river mouth. The Pacific Ocean is approximately 3 miles west of the Project area.

ENVIRONMENTAL RESOURCES AND CONSTRAINTS:

Water Supply Watershed:	No	Fault Zone:	No
Groundwater Recharge:	No	Scenic Corridor:	Yes
Timber or Mineral:	No	Historic:	No
Agricultural Resource:	Yes	Archaeology:	Yes
Biologically Sensitive Habitat:	Yes	Noise Constraint:	No
Fire Hazard:	No	Electric Power Lines:	Yes
Floodplain:	Yes	Solar Access:	No
Erosion:	Yes	Solar Orientation:	No
Landslide:	No	Hazardous Materials:	No
Liquefaction:	Yes	Other:	N/A

SERVICES:

Fire Protection:	City, County, CalFire	Drainage District:	Zone 7
School District:	Pajaro Valley Unified School District	Project Access:	Highway 1, Harkins Valley Road, West Beach Street
Sewage Disposal:	No	Water Supply:	No

PLANNING POLICIES:

Zone District: See Chart below

General Plan: See Chart

Special Designation: N/A

Urban Services Line: ☐ Inside ☒ Outside

Coastal Zone: ☒ Inside ☐ Outside

The 1.4-mile long trail alignment extends through several zoning classifications in both the County of Santa Cruz and City of Watsonville, as shown below. The trail sections and jurisdictional boundaries are shown in **Figure 2**. The entire Lee Road Trail alignment is within the Coastal Zone, which includes the area west of Highway 1 in this portion of the County.

Trail Section	City of Watsonville Zoning	City of Watsonville General Plan Designation(s)	County of Santa Cruz Zoning	County of Santa Cruz General Plan Designation(s)
Lee Road North	CZ-C or "Coastal Zone" EM-OS or "Environment Management – Open Space"	Coastal Zone Environmental Management	"PR" or "Parks, Recreation, and Open Space"	"O-C" or "Resource Conservation"
Struve Slough Bridge	EM-OS or "Environment Management – Open Space"	Environmental Management	"PR" or "Parks, Recreation, and Open Space"	"O-C" or "Resource Conservation"
Lee Road Middle	"IG" or "Industrial General"	Industrial	N/A	N/A
Watsonville Slough	"IG" or "Industrial General"	Industrial	N/A	N/A
Lee Road South	"IG" or "Industrial General"	Industrial	"CA" or "Commercial Agriculture"	"AG" or "Agriculture

ENVIRONMENTAL SETTING AND SURROUNDING LAND USES:

Natural Environment

The project area includes undeveloped open space within the Watsonville Slough Ecological Preserve, as well as paved roadways and an unpaved path, in the Coastal Zone, City of Watsonville and unincorporated Santa Cruz County.

Santa Cruz County is uniquely situated along the northern end of Monterey Bay approximately 55 miles south of the City of San Francisco along the Central Coast. The Pacific Ocean and Monterey Bay to the west and south, the mountains inland, and the prime agricultural lands along both the northern and southern coast of the county create limitations on the style and amount of building that can take place. Simultaneously, these natural features create an environment that attracts both visitors and new residents every year. The natural landscape provides the basic features that set Santa Cruz apart from the surrounding counties and require specific accommodations to ensure building is done in a safe, responsible and environmentally respectful manner.

The California Coastal Zone affects nearly one third of the land in the urbanized area of the unincorporated County with special restrictions, regulations, and processing procedures required for development within that area. Steep hillsides require extensive review and engineering to ensure that slopes remain stable, buildings are safe, and water quality is not impacted by increased erosion. The farmland in Santa Cruz County is among the best in the world, and the agriculture industry is a primary economic generator for the County. Preserving this industry in the face of population growth requires that soils best suited to commercial agriculture remain active in crop production rather than converting to other land uses.

PROJECT BACKGROUND AND PURPOSE:

The purpose of the project is to implement the City's Trails & Bicycle Master Plan; provide bicycle/pedestrian access to Pajaro Valley High School from the south, where there currently is no through access due to the submerged portion of Lee Road; and provide a connection to planned trails in the City and unincorporated lands, including the Land Trust of Santa Cruz County's Watsonville Slough Farm west of Lee Road, the Manabe-Ow Trail and Lower Watsonville Slough Trail east of Highway 1, and the Monterey Bay Sanctuary Scenic Trail Network (MBSST Rail Trail) at the south end. **Figure 2** shows the location of the proposed Lee Road Trail and other planned trails.

DETAILED PROJECT DESCRIPTION:

The City is proposing the Lee Road Trail Project (project) as shown in **Figure 2**. The 1.4-mile-long trail would generally be a 12-foot-wide pedestrian/bicycle trail along the east (inland) side of Lee Road, with a 12-foot-wide pedestrian/bicycle bridge over the portion of Lee Road extending through (and submerged by) Struve Slough. Additionally, portions of the trail would extend along Harkins Slough Road on the northwest end (hereafter referenced as north), along Lee Road south of Struve Slough, and along the unpaved path located on the north side of Watsonville Slough. South of Watsonville Slough, the bicycle lanes would continue along Lee Road to the railroad crossing at the southeast end (hereafter referenced as south). Accordingly, the 1.4-mile-long trail alignment is divided into the following five sections, as shown on **Figure 2**, for purposes of analysis and construction phasing. Typical cross sections are shown in **Figure 3**.

- Lee Road North
- Struve Slough Bridge
- Lee Road Middle
- Watsonville Slough
- Lee Road South

Trail Alignment

Lee Road North

This trail section (0.78 mile) includes the portion along Harkins Slough Road and along Lee Road to the Struve Slough crossing.

On Harkins Slough Road from the Pajaro Valley High School (PVHS) driveway to Lee Road, there would be a 4- to 6-foot-wide concrete sidewalk on the north side of the road (along the high school frontage) and 5-foot-wide bike lanes added to both sides of the road. The approximately 40 feet closest to the PVHS driveway would either be a sidewalk and bike lane, as described, or a combined pedestrian/bicycle path if determined more feasible or safe by the City and the County.

A new cross walk would be installed at the Harkins Slough Road/Lee Road intersection, crossing Harkins Slough Road on the east side of Lee Road (**Figure 2**).

The trail would continue as a combined pedestrian/bicycle path along the east (inland) side of Lee Road extending along the Watsonville Slough Ecological Reserve owned by the California Department of Fish and Wildlife (CDFW) to the new Struve Slough pedestrian/bicycle bridge. The trail would be 8-foot-wide pervious concrete with 2-foot-wide unpaved shoulders on each side. The trail would be located adjacent to Lee Road, approximately 5 feet from the roadway until just south of the Fitz property southern driveway (which is located on the opposite side of Lee Road).

Currently, there is an existing gate on Lee Road at this location that prohibits public vehicles from accessing the submerged portion of Lee Road and Struve Slough. Here, the trail alignment would shift from east of the roadway to the roadway. The gate would be modified to allow for the trail and still limit public vehicle access. A bollard would be installed in the path to prevent vehicles from passing. As the trail approaches Struve Slough, it would remain in the existing roadway and maintain the necessary elevation to access the Struve Slough Bridge.

Struve Slough Bridge

This trail section (0.17 mile) includes a new 12-foot-wide, 940-foot-long pedestrian/bicycle bridge over Struve Slough. The bridge would include a concrete deck, 54-inch or higher railings on each side, and utility conduit below the deck. The bridge is intended for bicycles and pedestrians only, but would be designed to accommodate a police car and maintenance vehicle.

The bridge would be constructed with abutments on each end and up to 4 piers, installed on the existing paved original grade of Lee Road (i.e., the submerged portion of Lee Road, of which the northbound lane would be removed for the piers), as shown in **Figure 4**. The bridge would have a curve in the center to stay above the curved roadway. The bridge deck would be located approximately 16 feet above the submerged portion of Lee Road, and the underside of the bridge would be at least 1 foot above the 100-year flood elevation.

The bridge would be designed in coordination with Watsonville Wetlands Watch and CDFW to ensure it includes aesthetic compatibility and minimal intrusion in the natural slough environment.

Lee Road Middle

This trail section (0.13 mile) includes the portion along Lee Road, between the Struve Slough Bridge and the Watsonville Slough crossing. Where the trail transitions from the bridge to Lee Road, the pedestrian and bicycle traffic would be split, and a replacement gate and bollard would be installed to prevent vehicular traffic accessing the submerged portion of Lee Road and Struve Slough. There would be a new 5-foot-wide concrete sidewalk on the west side of Lee Road, and 5-foot-wide bike lanes on each side of Lee Road. The roadway would be widened westward to accommodate the new bike lane, curb and gutter, and new sidewalk – all of which would be within the City's existing road right-of-way.

A new crosswalk with signage would be installed on the north side of the Watsonville Slough crossing to direct pedestrian trail users, as well as bicyclists, from the west side of Lee Road across to the east side of Lee Road to continue eastward along the Watsonville Slough section.

Watsonville Slough

This trail section (0.12 mile) includes the portion extending along the existing unpaved Lower Watsonville Slough Trail from Lee Road on the west, under Highway 1, to the convergence with the existing Manabe-Ow Trail on the east. In this area, the trail would be 8-foot-wide impervious chip seal with 2-foot-wide unpaved shoulders on each side.

Lee Road South

This trail section (0.20 mile) includes the portion along Lee Road from and including the Watsonville Slough channel crossing to the railroad crossing, where it would connect bicyclists to MBSST Rail Trail Segment 18 to be constructed by 2022. Like the Lee Road Middle section, there would be 5-foot-wide bike lanes on each side of Lee Road. The roadway would be widened slightly within the existing road right-of-way to accommodate the new bike lanes. The addition of a bike lane on the east side of this portion of Lee Road would require filling an existing drainage ditch and installing a storm drainpipe which would drain to the Watsonville Slough ditch.

As described above, pedestrians would be directed to the Watsonville Slough section because the sidewalk would not be continued in the Lee Road South section due to existing right-of-way constraints.

The project also includes replacement of the existing 60-inch culverts where Lee Road crosses the Watsonville Slough channel. The culvert needs to be replaced due to age and to accommodate the bike lane crossings. The replacement culvert would be a 5-foot-tall by 10-foot-wide box culvert, as described further under Drainage and Culvert Improvements.

Jurisdictional Boundaries

The proposed trail extends through both the City of Watsonville and unincorporated Santa Cruz County (**Figure 2**).

The portions of the proposed trail within the City are along Harkins Slough Road (Lee Road North section) and along the southern portion of Lee Road, between Struve Slough and the railroad tracks (Lee Road Middle and Lee Road South sections).

The portion of the trail in County jurisdiction is along the northern portion of Lee Road, between Harkins Slough Road and Struve Slough (Lee Road North section).

The Lee Road North section extends through the Watsonville Slough Ecological Reserve owned by the CDFW. The entire Lee Road Trail alignment is within the Coastal Zone, which includes the area west of Highway 1 in this portion of the County.

Trail Design, Amenities and Features

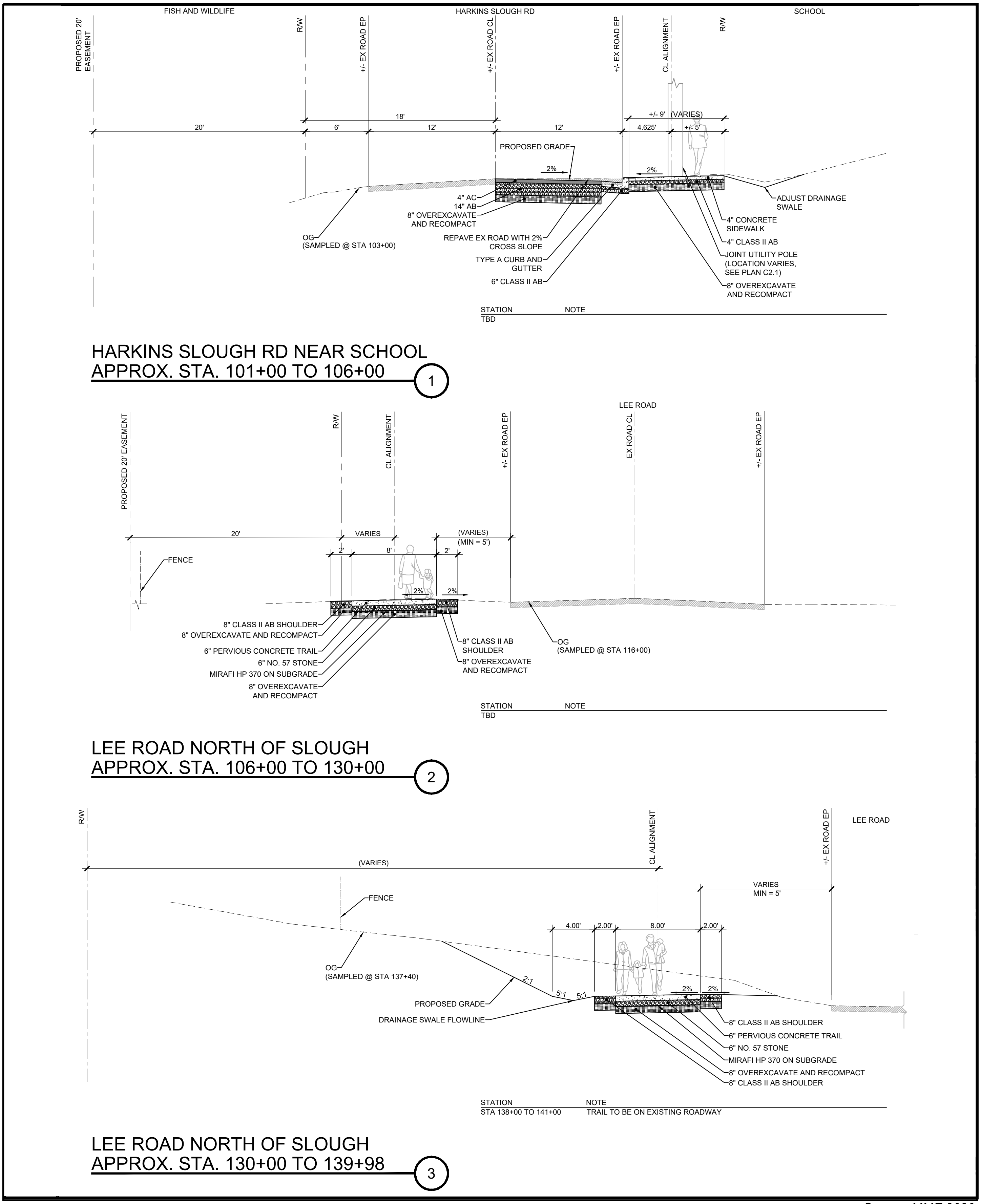
Design Engineering

The project elements (pedestrian/bicycle trail and bridge, sidewalks and bicycle lanes, retaining walls, culvert replacement and drainage improvements) would be designed in accordance with:

- California Highway Design Manual, Chapter 1000;
- 2019 California Building Code;
- Santa Cruz County Design Criteria, 2018, Part 2 Street Design;
- Santa Cruz County Code;
- Watsonville Bike Safety Guidelines/Design Standards;
- American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Guide Specifications for the Design of Pedestrian Bridges;
- AASHTO LRFD Bridge Design Specifications, 8th Edition with California Amendments;
- American Society of Civil Engineers (ASCE) 7-16, Minimum Design Loads, and Associated Criteria for Buildings and Other Structures; and
- Recommendations included in the Geotechnical Investigation (Pacific Crest 2020, **Attachment F**), Hydrologic and Hydraulic Analyses (Balance Hydrologics 2020a, **Attachment G**), and Culvert Hydraulic Analysis (Balance Hydrologics 2020b, **Attachment H**) prepared for the project.

ADA Accessibility

The trail would meet Americans with Disabilities Act (ADA) requirements throughout the project alignment, including the pedestrian/bicycle path portions along Lee Road, Struve Slough Bridge, and Watsonville Slough and the sidewalk portions along Harkins Slough Road and Lee Road south of the Struve Slough Bridge. There would be ADA compliant curb ramps where appropriate (e.g., crosswalks and driveways).



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Source: MME 2020.

Harris & Associates

Figure 3a

Typical Cross Sections of Lee Road Trail

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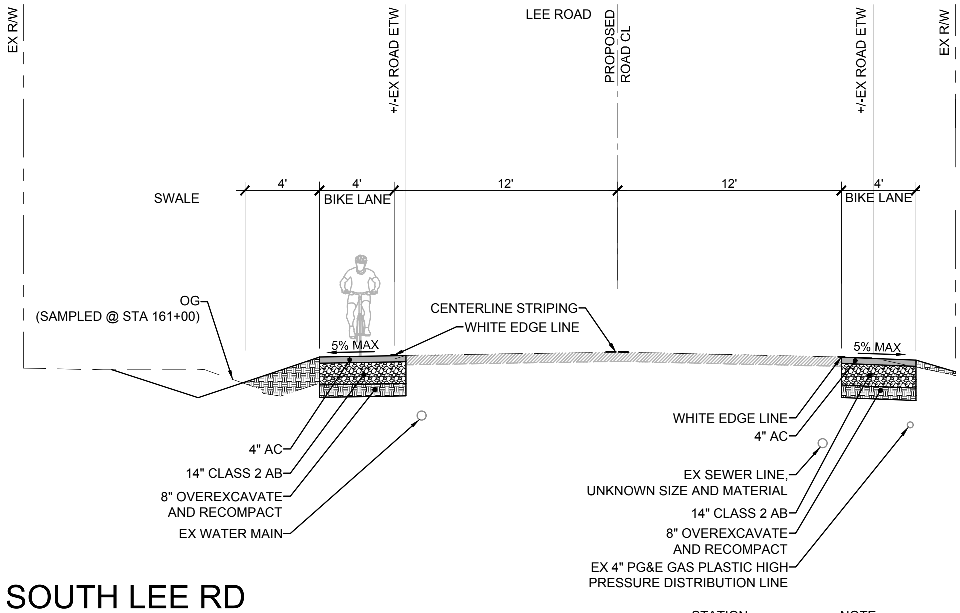
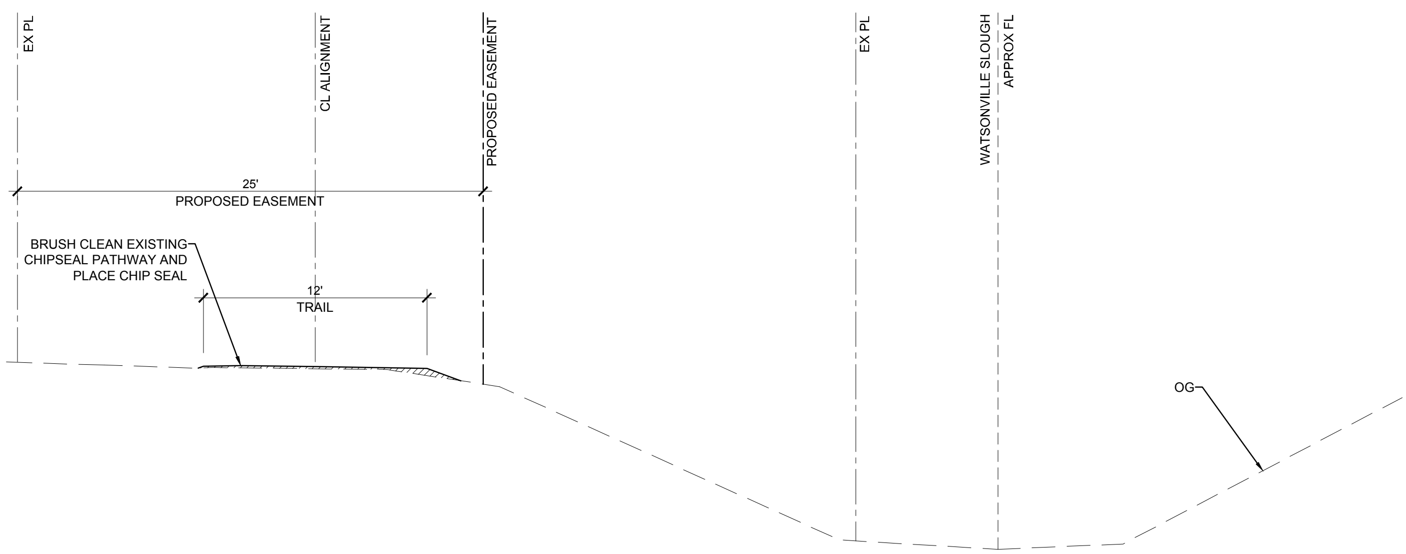


SOUTH LEE RD
APPROX. STA. 159+00 TO 169+00

7

SCALE: 1" = 5'

STATION	NOTE
TBD	



OW TRAIL TYPICAL SECTION
CL ALIGN - STA 158+00

8

SCALE: 1" = 5'

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Source: MME 2020.

Harris & Associates

Figure 3b

Typical Cross Sections of Lee Road Trail

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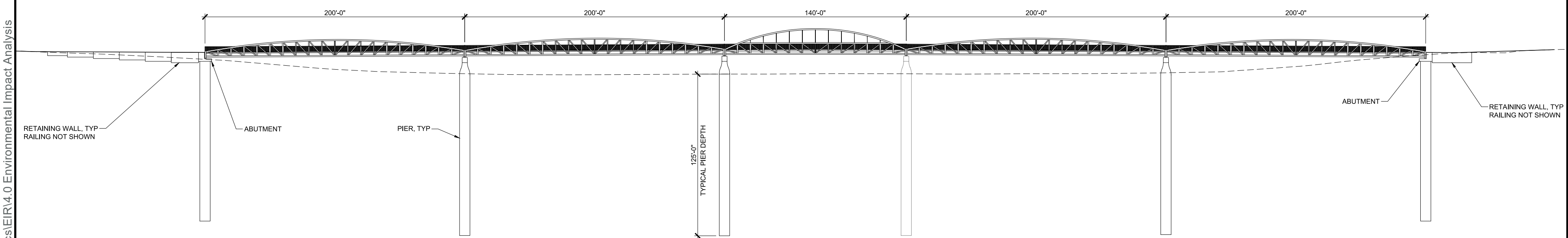

Source: MME 2020.

Harris & Associates

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Figure 4a

Struve Slough Bridge

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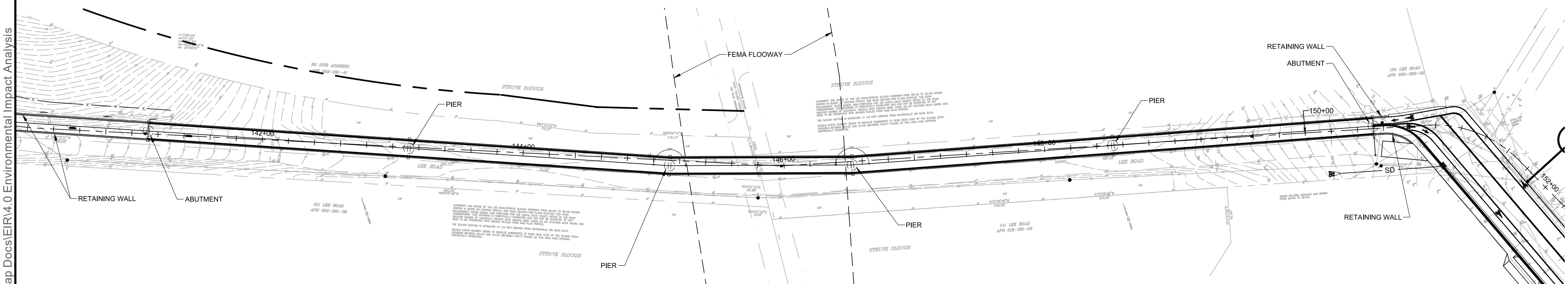

Source: MME 2020.

Harris & Associates

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Figure 4b

Struve Slough Bridge

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Vista Points

The trail would include up to three vista points (i.e., overlooks) along the Lee Road North section. The vista points are planned at the following locations, from north to south: 1) trail crest 1,000 feet south of Harkins Slough Road, 2) trail crest across from the Watsonville Slough Farm driveway entrance where a crosswalk with signage would be installed to cross Lee Road and access the planned trails in Watsonville Slough Farm, and 3) trail crest near the Fitz property north driveway before the trail descends toward Struve Slough (**Figure 2**).

In these areas, there would be a pull-out that is approximately 6 feet by 6 feet with educational/interpretive signage and trash and recycling bins. There would likely be signage at the north end near the Harkins Slough Road crossing, although there may not be adequate space for a pull-out.

Signage

Educational/interpretive signage would be located at the vista points described above, at the north end of Lee Road near the Harkins Slough Road crossing, and possibly other locations. The signage would be developed by Watsonville Wetlands Watch in coordination with CDFW, LTSCC, and Coastal Commission staff.

All trail related signage would be sited and designed to encourage safe and appropriate trail use, ensure maximized coastal views, and educate the public on the project or surrounding environment, cultural resources, and/or history.

Accordingly, the signage would include educational information about the Watsonville Slough Ecological Reserve, Watsonville Slough Farm, natural resources, agricultural resources, and history of the area. It would also include trail use guidelines and restrictions (described under Trail Operations and Maintenance).

Additionally, there would be “Pedestrian/Bicycle Crossing” warning signs installed along Harkins Slough Road and Lee Road near the new crosswalks, and the crosswalks would be striped for visibility in accordance with County and City standards. The City and County would install additional signage along the roadway and trail as determined appropriate for safety where the trail crosses driveways.

Fencing

Fencing would be installed in the Lee Road North section where the trail is adjacent to the Watsonville Slough Ecological Reserve to encourage trail users to stay on the trail and outside the CDFW Reserve, which can be accessed at the north end near Harkins Slough Road with permission. The fencing would allow wildlife movement. Additionally, native vegetation, such as California blackberry and wild rose, would be planted along the fencing to deter trespassing into the Reserve in the northern portion. The width of this vegetative buffer would be determined in coordination with CDFW (and other property owners, as applicable).

Additionally, there would be guard railing made of steel rails and steel pickets on the elevated Struve Slough Bridge section for trail user safety and slough protection.

Trail Operations and Maintenance

Trail Users

The trail is estimated to have a total of up to approximately 225 users per day, with 25 bicyclists and 200 pedestrians[1], throughout the week at full buildout of the project (i.e., when all trail sections are constructed and operating), as well as other planned trails (LTSCC Watsonville Slough Farm trail system, City Trail & Bicycle Master Plan, and Monterey Bay Sanctuary Scenic Trail network). On weekdays, the users would be predominately high school students accessing Pajaro Valley High School located on Harkins Slough Road. On weekends, the users would be predominately recreationists.

The project does not create new parking areas. It is anticipated that trail users would originate from other trail connections and locations in the City, although weekend users may park along the Lee Road shoulders. Additionally, at the north end, users may park along Harkins Slough Road, in the Pajaro Valley High School Parking lot when the gates are open, or in the future parking area on LTSCC property once it is constructed as part of the Watsonville Slough Farm trail system. On the south end, additional parking may become available in the parking lot at the hotel/shopping center being constructed at Lee Road near West Beach Street.

Trail Operation

Hours. Trail usage would be limited to daylight hours, from dawn to dusk. The hours would be posted on the trail signage. No trail access gates are proposed to close the trail.

Electric Bicycles. The ADA-accessible trail is intended for pedestrians and bicyclists. In accordance with Assembly Bill (AB) 1096, Class 1 and Class 2 e-bikes are legal on any paved surface that a regular bike is allowed to operate[2]. Electronic skateboards with a rating limited to 20 miles per hour would be allowed as well. Depending on the volume of users, other speed limits may be imposed and indicated on posted signage.

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[1] The Watsonville Public Works & Utilities Department used two methods to estimate trail use. One was the method used in the Santa Cruz County Regional Transportation Commission's Trails Master Plan, which assumed that the trail was a park and assigned a trip generation rate per acre. The other method was to use mode splits for automobile, bicycles and pedestrians from data collected for six Watsonville intersections. The mode split data was also used to determine the number of bicycles and pedestrians, considering Watsonville has very few bicycle riders.

[2] As defined in AB 1096, a Class 1 e-bike, or low-speed pedal-assisted electric bicycle, is equipped with a motor that aids only when the rider is pedaling and that stops providing assistance when the bicycle reaches 20 miles per hour (mph). Class 2 e-bikes, or low-speed throttle-assisted electric bicycle, but that cannot provide assistance when the bike reaches 20 mph. A Class 3 e-bike, or speed pedal-assisted electric bicycle, is equipped with a motor that provides assistance only when the rider is pedaling and stops providing assistance when the bicycle reaches 28 mph. Operators of Class 3 e-bikes must be 16 or older and wear a helmet. Class 3 e-bikes are prohibited from Class I multi-use bike paths unless specifically authorized by a local ordinance.

No Dogs/No Smoking. In accordance with CDFW guidance, there would be no dogs and no smoking allowed on the trail extending along CDFW property. Dogs may be allowed on leash on other portions of the trail. These restrictions would be included on the trail signage.

Lighting. There would be no trail lighting to protect the sensitive biological resources in the Watsonville Slough Ecological Reserve. However, there are existing streetlights along the Lee Road Middle and Lee Road South sections. Additional lighting may be included along these sections and along the Watsonville Slough Trail section extending beneath Highway 1 for security. Any lighting along installed on the Struve Slough Bridge and along channelized Watsonville Slough would be wildlife friendly (directed downward and away from aquatic features). Additionally, low-level, low-profile lighting may be considered on the bridge subject to California Coastal Commission requirements and approval.

Security. The City of Watsonville Police Department and County of Santa Cruz Sheriff would routinely patrol portions of the trail within their respective jurisdictions for safety. This includes monitoring for loitering, encampments, and illegal activity along the public trail. The patrols and bi-weekly trail maintenance described below would be performed collaboratively to ensure weekly monitoring and presence along the trail.

Additionally, the County would post “no parking” or “limited parking” (no nighttime parking) signs along Lee Road in the Lee Road North section. Initially, the signs would be posted on the trail side where there is no room for parking for safety because the trail is approximately five feet from the road. Parking restrictions would be increased as necessary (e.g., on both sides of the road) due to public nuisance for safety and security. These parking restrictions would also minimize vehicle strikes along Lee Road.

Trail Maintenance

The trail would be operated and maintained by the City public works department. Routine trail maintenance activities would include the following.

- Bi-weekly monitoring. This would involve a small vehicle which would drive and park along Lee Road and Harkins Slough Road and access the trail on foot to check for necessary maintenance activities, as listed below.
- Trash and recycling collection and disposal on a monthly basis or more often if needed.
- Tree and shrub trimming, fallen tree removal, shoulder grass mowing, and weed removal. Near the sloughs, these activities would occur during the dry season, typically April 15 to October 15, or at least two weeks after March or April rains.
- Path repair and maintenance
- Graffiti removal
- Fence repair and replacement
- Signage repair and replacement
- Drainage inspection and cleaning

Trail Construction

Table 1 provides a summary of the trail dimensions and estimated construction timeframe, earth disturbance, and new impervious surface.

Timeframe and Phasing

The 1.4-mile trail is comprised of five sections, which would be constructed in three phases planned as follows.

- Phase 1 (2021-2022): Lee Road North with 6-month duration.
- Phase 2 (2023-2024): Struve Slough Bridge, Lee Road Middle, and Watsonville Slough with 12-month duration beginning two years after Phase 1, and segments constructed in sequence to minimize construction traffic in the project area.
- Phase 3 (2025-2026): Lee Road South with 9-month construction duration beginning two years after Phase 2.

Construction near the Watsonville Slough Ecological Reserve, Struve Slough, and Watsonville Slough would occur during the dry season, typically April 15 to October 15.

In accordance with County Code Chapter 13.12, the hours of construction and grading activities would be limited to between 8:00 a.m. and 5:00 p.m. on weekdays, unless the Building Official has in advance authorized to between the hours of between 7:00 a.m. and 7:00 p.m. Such activities shall not take place on Sunday or a federal holiday unless the Building Official has in advance authorized such work. Construction traffic on Harkins Slough Road may be adjusted to avoid the morning school commute times.

General Methodology

Overall, construction activities for the project would include clearing, grading, placement of aggregate base and concrete or pavement, and native revegetation where vegetation was removed.

All Trail Sections (except Struve Slough Bridge). The disturbance corridor for construction activities is estimated to be 20 feet wide along the trail alignment. In the Lee Road Middle and Lee Road South sections, construction activities would occur on both sides of the roadway and would all be within the existing public road right-of-way. Excavation depth would be 12 to 18 inches.

Large construction equipment would include trail dozers, skid steers, narrow track loaders, rollers, and vibrating plate compactors. Specialized narrow-width equipment is anticipated to be used in areas where minimization of the width of construction impact is a priority. Hand excavation may be required in limited areas where the trail may cross within the dripline of trees or other sensitive resources.

Table 1. Project Characteristics and Construction Estimates

Information	Lee Road North	Struve Slough Bridge	Lee Road Middle	Watsonville Slough	Lee Road South
Project Characteristics					
Trail Length (1.4 miles)	0.78 mile	0.17 mile	0.13 mile	0.12 mile	0.20 mile
Trail Width and Description	Harkins Slough Rd (0.10 mile): 4-6' wide concrete sidewalk with crosswalk across Harkins Slough Road and 5' wide bike lanes along roadway Lee Rd (0.68 mile): 8' wide pervious concrete multiuse path with 2' wide unpaved shoulders	12' wide concrete multiuse bridge deck with up to 4 piers	5' wide concrete sidewalk with 5' wide bike lanes along roadway	8' wide chip seal **(2)** multiuse path with 2' wide unpaved shoulders	5' wide bike lanes along roadway, including Watsonville Slough culvert
New impervious surface (1.59 acres total)	0.74 acre	0.33 acre	0.04 acre	0.12 acre	0.36 acre **(3)**
Construction Estimates					
Construction Phasing	2021/2022 Phase 1	2023/2024 Phase 2	2023/2024 Phase 2	2023/2024 Phase 2	2025/2026 Phase 3
Construction Duration	6 months	6 months	3 months	3 months	9 months
Excavation Depth	Up to 18"	Up to 125 feet for bridge pilings	Up to 18"	Up to 12"	Up to 18"
Estimated Total Disturbance Area	2.17 acres	0.58 acres	0.24 acres	0.18 acres	0.36 acres
Excavation/Exported **(1)**	1,490 CY	400 CY	510 CY	32 CY	670 CY
Material Imported:					
Aggregate Base	760 CY	80 CY	250 CY	290 CY	490 CY
Pavement	120 CY	12 CY	70 CY	0	100 CY
Concrete	45 CY	310 CY	82 CY	0	500 CY
No. 57 Stone	500 CY	0	0	0	0
Pervious Concrete	500 CY	0	0	0	0
Chip Seal **(2)**	0	0	0	570 SY	0

(1) Excavated materials would be used on site to the extent practicable, but the environmental analysis assumes all would be exported offsite to provide for a worst-case analysis.
(2) Chip seal, which is comprised of a layer of base rock and coating of oil with chip in it, is the City's typical standard for trail construction. The unpaved shoulders are typically smaller rock, like gravel.
(3) The estimate of 0.36 acre of new impervious surface and disturbance area, as well as the materials exported and imported, in the Lee Road South section is overestimated because it is based on a previous design whereby a new sidewalk was on west side of Lee Road (currently unpaved). The current design does not include a sidewalk in the Lee Road South section.

Struve Slough Bridge Section. Bridge construction would include abutments on each end and up to 4 piers installed up to 125 feet deep below the existing submerged paved roadway. The eastern lane (approximately 50%) of the submerged asphalt roadway would be removed to accommodate the piers, and the western lane would be retained in place so utility providers have access to the existing utility poles. Anticipated equipment includes drill rigs, cranes, excavators, and dump trucks. There would be drilling but no pile driving.

In order to protect water quality and facilitate construction, temporary dewatering of Struve Slough would occur for up to 3 to 4 months during the dry season (between April 15 and October 1). Clean gravel with passive gravity culverts would be placed on top of the existing road pavement, and would be removed once bridge construction is complete. Some pumping would be required for pier drilling.

Watsonville Slough (Lee Road South Section). For work within the channelized Watsonville Slough at the culverts under Lee Road, temporary dewatering would be required. Temporary sandbag dams would be installed at each end to isolate the slough from the construction site. A screened pump diversion system would be used to divert low flows around the construction site. A diversion would be necessary due to the tight physical constraints and the need to maintain vehicular access along Lee Road during construction. Temporary dewatering would take place during the dry season (between April 15 and October 1) for up to 2 to 3 months.

Utilities

Most utilities, including utility poles, aerial lines, and buried utilities, would remain in place undisturbed, with the exception of the following[3].

- Three utility poles and one guy wire along Harkins Slough Road would be moved approximately 10 feet northward to accommodate the proposed sidewalk.
- One guy wire pole at the southeast end of the new Struve Slough Bridge would be relocated.
- One buried gas main, approximately 1,200 linear feet along the southern approach to Struve Slough, would be relocated. Additionally, approximately 200 feet of the gas main extending at the Watsonville Slough culvert may need to be raised above the new culvert.

The new bridge over Struve Slough would include utility conduits so that overhead poles and wires currently extending along the submerged portion of Lee Road could be removed in the future. Any potential disruption to service would be coordinated in advance with service providers.

Drainage and Culvert Improvements

In general, the existing drainage patterns would be retained as storm water runoff that would sheet flow across the Trail and/or roadway surface to adjacent pervious areas and existing

[3] The utility modifications are based on 65% design, and there may be more minor utility locations identified during the 100% design phase.

swales and drainage facilities. In some locations, there would be alterations to existing facilities to accommodate the proposed trail. Proposed altered and new drainage facilities along the trail alignment include the following, by trail section from north to south.

With these project features, the project should be exempt from stormwater regulation with the Regional Water Quality Control Board (RWQCB) guidelines. The State Phase II Small MS4 General Permit was re-adopted (Order 2013-0001-DWQ) and the new requirements became effective July 1, 2013[4].

- **Lee Road North**. Currently, stormwater runoff flows along the north side of Harkins Slough Road, between the high school driveway and Lee Road. A vegetated swale would be developed adjacent to this location to accommodate the sidewalk and direct stormwater runoff away from the sidewalk and road. Sheet flow would drain north into the proposed swale and existing catch basin that flows under Harkins Slough Road and onto vegetated open space land on the south side of the road. The bike lane, curb and gutter would connect to this existing catch basin as well. The existing catch basin would be modified to raise the rim to the finished sidewalk grade, fill in side openings, and add a pipe connection to the new storm drain inlet. Near the high school driveway, an existing storm drain inlet would be relocated and a new storm drain added, connecting to an existing storm drain pipeline.

  Additionally, at the south end of the Lee Road North section, an approximately 700-foot-long vegetated drainage swale (bioswale) would be created on the uphill side of the trail. The bioswale would begin approximately 340 feet north of the existing gate on Lee Road. The function of the bioswale would be to capture and convey stormwater runoff to a rock-lined infiltration basin north of the Struve Slough Bridge approach. On the downhill side of the trail, runoff from the hillside currently collects along the edge of the roadway and drains to the slough. A bioswale would be created in this area adjacent to the proposed trail.
- **Lee Road Middle**. New storm drainage facilities would be installed on the southwest side of the new Struve Slough Bridge to control drainage. There would be storm drain inlet in the new curb and gutter to convey stormwater to a buried pipeline (approximately 3 feet deep), extending approximately 150 feet to an outfall with a rock dissipater in a vegetated area on the south side of Struve Slough.

  Additionally, new storm drainage facilities would be installed on the northwest side of the Watsonville Slough channel and new crosswalk. There would be storm drain inlet in the new curb and gutter to convey stormwater to a buried pipeline (approximately

[4] City: https://www.cityofwatsonville.org/DocumentCenter/View/2684/Stormwater-Post-Construction-Standards-PDF?bidId=

County: https://www.dpw.co.santa-cruz.ca.us/Portals/19/pdfs/Design%20Crit/DESIGNCRITERIA.pdf

3 feet deep), extending approximately 50 feet to an outfall with a rock dissipater on the north side of the Watsonville Slough channel.

- **Lee Road South**. As described in the Lee Road South section above, the project includes replacement of the existing culvert, two aged 60-inch-diameter corrugated metal pipes (CMP), where Lee Road crosses Watsonville Slough channel. The proposed culvert would be a precast concrete box culvert with an invert elevation of 5 feet, a crown elevation of 10 feet, a width/span of 10 feet, and a length of 55 feet. The preliminary modeling results for the existing and proposed conditions, show the proposed culvert design would not cause a rise in the 100-year water service elevation of the Watsonville Slough at the project location (Balance Hydrologics 2020b).

  As previously described under **Watsonville Slough (Lee Road South Section),** temporary dewatering is required to protect water quality and facilitate construction. Temporary sandbag dams would be installed at each end to isolate the slough from the construction site. A screened pump diversion system would be used to divert low flows around the construction site. A diversion would be necessary due to the tight physical constraints and the need to maintain vehicular access along Lee Road during construction. Temporary dewatering would take place during the dry season (between April 15 and October 1) for up to 2 to 3 months.

Additionally, the existing non-jurisdictional drainage ditch (bare earth, degraded with some weedy vegetation) along the inland/east side of Lee Road, south of the Watsonville Slough channel, would be converted to a pipe so the roadway could be widened to accommodate the new bike lane. The new curb and gutters would have storm drain inlets to the pipe, which would convey stormwater northward to Watsonville Slough ditch, similar in capacity and flows as the existing ditch. On the coastal/west side of Lee Road, stormwater runoff would sheet flow from the roadway to the unpaved shoulder area, similar to existing conditions.

Construction Staging

Construction staging areas would be located on existing pavement and disturbed areas within the road right-of way where there is adequate room to support construction vehicles and/or materials. Staging areas would not extend into private property without prior agreements and would be at least 50 feet away from any waters, drainages or the Ecological Reserve. Where this separation cannot be achieved, appropriate protections would be provided and maintained in accordance with permit requirements. Following project implementation, the staging areas and all affected areas within the project area would be returned to pre-project conditions.

Best Management Practices

The following best management practices (BMPs) would be implemented during project construction to protect natural resources and comply with agency guidelines, requirements, laws and regulations. These measures would be included in the construction specifications and implemented by the construction contractors and professionally qualified staff, as required.

The City would perform routine inspections of the construction area to verify the BMPs are properly implemented and maintained. The City would notify the contractor immediately if there was a violation that would require immediate compliance.

Air Quality

The following BMPs would be implemented in accordance with the Monterey Bay Air Resources District's recommendations for the control of short-term construction generated emissions.

- Water all active construction areas at least twice daily as necessary and indicated by soil and air conditions.
- Prohibit all grading during periods of high wind (over 15 mph).
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed areas.
- Haul trucks shall maintain at least 2' 0" freeboard.
- Cover all trucks hauling soil, sand, and other loose materials.
- Plant native vegetative ground cover in disturbed areas as quickly as possible.
- Cover inactive storage piles.

Biological Resources

The following measures would be implemented to protect natural resources in the project area, including those associated with the sloughs and drainages.

- Construction near the Watsonville Slough Ecological Reserve, Struve Slough, and Watsonville Slough will occur during the dry season.
- Construction fencing will be erected to limit construction impacts to sensitive resources, such as areas along the Watsonville Slough Ecological Reserve, Struve Slough, Watsonville Slough, and any existing trees. In undisturbed areas as much as practical, the construction zone would be limited to a 20-foot corridor to minimize impacts to habitat and wildlife. Additionally, construction fencing will have openings every 50 feet that would allow passage of wildlife.
- During construction, all food trash that may attract predators into the work area should be properly contained and removed from the work site on a daily basis. Construction debris and trash should also be properly contained and removed from the work site on a regular basis.

Erosion Control and Water Quality

The following measures would be implemented in accordance with the *County of Santa Cruz Construction Site Stormwater Pollution Control BMP Manual (October 2011 edition),* to control erosion, sediment and stormwater pollution.

- Storm drain inlets will be protected with sandbags or other comparable containment or filter berms and barriers.
- Sandbags and/or straw bales will be installed around the perimeter of construction and staging areas.
- All surplus asphalt and rubble will be removed from the project area and transported to the local landfill or approved disposal site.
- To the greatest extent possible, all exposed or disturbed areas within the construction area will be stabilized.
- Erosion control measures will be implemented and modified, repaired, or replaced as needed. These may include silt fences, weed-free straw bales, plywood, straw wattles, water check bars, and broadcast weed-free straw wherever silt laden water has the potential to leave the work site and enter the nearby drainages.

Prior to approval of a grading or building permit, the project must have an approved stormwater pollution control plan (SCCC Section 7.79.100), which would specify detailed erosion and sedimentation control measures. The plan would include provisions for disturbed areas to be planted with native vegetation to establish a groundcover that would minimize surface erosion.

Additionally, the project would result in the ground disturbance of over an acre of land, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared for the project that would include sedimentation and erosion control plans, in accordance with the State Water Resources Control Board Construction General Permit. Within the SWPPP, standard County BMPs to minimize erosion and sedimentation would be included. These measures require that a hazardous material spill prevention control and countermeasure plan be developed before construction begins to minimize the potential for and the effects of hazardous or toxic substances spills during construction.

Hazards and Hazardous Materials

In addition to the measures included in the hazardous material spill prevention control and countermeasure plan described above, the following measures would be implemented to protect natural resources associated with the sloughs and drainages:

- Prohibit smoking or allow workers to smoke in designated areas clear of dry vegetation and away from hazardous materials. Dispose of cigarette butts in an appropriate area away from the project site.
- Vehicles and equipment will be maintained in accordance with manufacturer’s standards, and any leaks or emissions in violation of these standards would be immediately repaired or resolved.

- Refueling and/or maintenance of vehicles and equipment will be performed in designated staging areas. Workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
- All stationary equipment such as motors, pumps, generators, and/or compressors will be positioned over drip pans. Vehicles and equipment will be stored in designated staging area(s), and parked equipment over drip pans or absorbent material.

Traffic Control

During construction, individual traffic lanes within the public roadways would be intermittently closed. To minimize project effects on local traffic, the construction contractor would:

- Prior to the start of construction activities that could disrupt traffic, notify adjacent property owners and businesses, and emergency personnel of construction timeframe and the location of planned lane closures;
- Prior to the start of construction, install signage that includes the dates for construction, contact information for the City liaison to answer project specific questions;
- Ensure that roadways within the project area remain open (i.e., one lane of traffic would be open, although it may have controlled access) to the greatest extent possible, and that lane closures would be safely and effectively managed with appropriate safety flags and signage; and
- Ensure that emergency vehicle access is retained at all times.

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III. ENVIRONMENTAL REVIEW CHECKLIST

A. AESTHETICS AND VISUAL 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
1. Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐

Discussion: The proposed trail alignment extends through undeveloped open space with views overlooking Struve Slough, the West Branch of the Struve Slough, agricultural land, and other natural resources in the Coastal Zone.

Portions of the proposed trail, along Harkins Slough Road and along Lee Road between Struve Slough and the railroad tracks are located within the jurisdiction of the City of Watsonville. The remainder of the trail, between Harkins Slough Road and Struve Slough, is located within the County of Santa Cruz (**Figure 2**). Neither the County of Santa Cruz nor the City of Watsonville have identified scenic vistas around the project area; however, the trail would be located adjacent to, or visible from jurisdictional designated scenic roadways and highway, as described under question 2.

The trail would create up to three vista points (i.e., overlooks) along the Lee Road North section. The vista points are planned at the following locations, from north to south: 1) trail crest 1,000 feet south of Harkins Slough Road, 2) trail crest across from the Watsonville Slough Farm driveway entrance where a crosswalk with signage would be installed to cross Lee Road and access the planned trails in Watsonville Slough Farm, and 3) trail crest near the Fitz property north driveway before the trail descends toward Struve Slough (**Figure 2**). In these areas, there would be a pull-out that is approximately 6 feet by 6 feet with educational/interpretive signage and trash and recycling bins.

The signage would be developed by Watsonville Wetlands Watch in coordination with CDFW, LTSCC, and Coastal Commission staff. In accordance with the Coastal Commission's draft trail policies, the signage would be sited and designed to encourage safe and appropriate trail use, ensure maximized coastal views, and educate the public on the project or surrounding environment, cultural resources, and/or history. The signage would be located at three vista points to maximize views The signage would include trail use guidelines, restrictions, and educational information about the Watsonville Slough Ecological Reserve, Watsonville Slough Farm, natural resources, and history of the area.

The proposed trail would not result in a substantial adverse effect on any public scenic vistas in the area. The proposed vista points would create public scenic vistas by provide accessible enhanced views of the natural slough environment, which could be considered a beneficial impact. Therefore, this impact would be **Less than Significant**. No mitigation would be required.

2. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐

Discussion: The County and City both identify State Route 1 (Highway 1) to be a "scenic roadway" (City of Watsonville 2005 General Plan, County of Santa Cruz 1994 General Plan). Additionally, the City of Watsonville identifies Harkins Slough Road to be a scenic road (City of Watsonville 2005 General Plan). The State of California, however, does not identify State Route 1 through Santa Cruz County as a "state scenic highway" (https://dot.ca.gov/-/media/dot-media/programs/design/documents/od-county-scenic-hwys-2015-a11y.pdf).

The proposed project (trail) would not damage or alter any scenic resources, including the sloughs, trees, rock outcroppings, or historic buildings within a designated state scenic highway. Therefore, this impact would be **Less than Significant**. No mitigation would be required.

3. 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?	☐	☐	☒	☐

Discussion: The existing visual setting includes undeveloped open space comprised of natural habitat (sloughs) and agricultural land adjacent to and visible from public roadways. The visual character and quality of these views can be considered high, particularly in the north portion of the trail alignment. Views from public vantage points (roadways) in the southern portion includes industrial land uses of lower visual quality, and there are no City or County zoning or other regulations governing scenic quality. **Attachment B** includes representative photographs of the project area.

The proposed trail would be adjacent to and along the existing roadways and would be located at approximately the same grade/level as the roadways. As described in the project description, the trail would be 8-foot-wide pervious concrete with 2-foot-wide unpaved shoulders on each side in the Lee Road North and Watsonville Slough sections, a sidewalk with bike lanes in the roadway in the Lee Road Middle section and along Harkins Slough Road in the Lee Road North section, and bike lanes in the roadway in the Lee Road South section. New cross walks would be installed at three locations (see **Figure 2**) and would be consistent with standard crosswalk designs through the City of Watsonville and County of Santa Cruz.

The Struve Slough Bridge section of the trail would be a 12-foot-wide, 940-foot-long pedestrian/bicycle bridge over Struve Slough. The bridge would include a concrete deck, 54-inch or higher railings on each side, and utility conduit below the deck. The bridge is intended for bicycles and pedestrians only, but would be designed to accommodate a police car and maintenance vehicle. A cross section of the bridge is shown in **Figure 3**. The bridge would be constructed with abutments on each end and up to 4 piers, as shown in **Figure 4**. The bridge would have a curve in the center to stay above the curved roadway. The bridge deck would be located approximately 16 feet above the submerged portion of Lee Road, and the underside of the bridge would be at least 1 foot above the 100-year flood elevation.

The project would alter the existing visual character of the project area by introducing a trail and bridge over the slough. The portions of the trail that are sidewalk and bike lanes in the roadway would only slightly alter the existing visual character by introducing these elements. These changes are considered minor and would not substantially degrade the existing visual character or quality of public views around the project alignment or its surroundings.

Further, the new bridge would be over the existing submerged roadway, which is not submerged in dry years, and would be similar in character to the existing roadway. The bridge would also be designed in coordination with Watsonville Wetlands Watch and CDFW to ensure it includes aesthetic compatibility and minimal intrusion in the natural environment. The project (trail) is intended to and would allow greater public access and views to the natural environment and views surrounding the Struve Slough.

Therefore, this impact would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Discussion: The project does not include trail lighting to protect the sensitive biological resources in the Watsonville Slough Ecological Reserve. However, low-level, low-profile lighting may be considered on the Struve Slough Bridge section, subject to California Coastal Commission requirements and approval, and along the Watsonville Slough Trail section for security. Any lighting along Watsonville Slough would be wildlife friendly (directed away from the slough. The project would create an incremental increase in night lighting that would be similar in character to the existing street lighting along Lee Road and associated with the surrounding industrial land uses. The additional lighting would not be considered substantial light that would adversely affect nighttime views. During construction, there could be a minor amount of glare as sun reflects off metal construction equipment, but it would be temporary and would not adversely affect daytime views in the area. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

B. AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. 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?	☐	☐	☒	☐

Discussion: The proposed trail alignment is within and adjacent to County and City road right-of-way for Lee Road and Harkins Slough Road (**Figure 2**). There is existing agricultural land on the west side of Lee Road, zoned by the County for Commercial Agriculture and identified as "Prime Farmland" pursuant to the Farmland Mapping and Monitoring Program (**Figure 5**) (CDC 2016).

As shown in **Table 2** below, the proposed trail would not encroach on agricultural land. The proposed bicycle lanes and associated improvements in the Lee Road South section would be within the road right-of-way.

The Santa Cruz County Agricultural Commissioner's office is responsible for issuing pesticide spraying permits and regulating the use of pesticides and other agricultural chemicals, and would not place additional restrictions upon the agricultural operator as a result of the proposed bicycle lanes as long as they are applied in compliance with the label, worker safety requirements, weather conditions, drift restrictions, and all other safety requirements as required by federal, state and local laws.

To prevent and minimize potential conflicts, Santa Cruz County General Plan Policy (5.13.23) and Santa Cruz County Municipal Code (Section 16.50.059) require a 200-foot buffer setback between commercial agricultural land and nonagricultural uses involving habitable spaces, recreation structures, or intensive outdoor use. These policies are focused on stationary uses, whereas the bicycle lanes would have transitory trail users passing through the area, reducing the potential for conflict.

Therefore, the impact would be **Less than Significant**. No mitigation would be required.

Table 2. Proposed Project Impacts on Agricultural Land.

Trail Section	Jurisdiction	Impact Agricultural Land (Prime Farmland)?	Acres
Lee Road North	County/City	No. The trail would be on the east side of Lee Road zoned PR and would not encroach on the west side of Lee Road zoned by the County as CA-W[1].	0
Struve Slough Bridge	County/City	No. The trail crosses Struve Slough.	0
Lee Road Middle	City	No. The trail (sidewalk and bike lanes) extends through City industrial area.	0
Watsonville Slough	City	No. The trail extends along an unpaved path surrounded by industrial development.	0
Lee Road South	County/City	No. The trail (bike lanes) extends within the road right-of-way with city industrial land on the east side of Lee Road and county agricultural land zoned CA-W[1] on the west side of Lee Road. The trail would not encroach on agricultural land.	0

Source: GIS calculations prepared by Harris & Associates and EcoSystems West for impacts to Agricultural habitat type (2020a). Refer to **Table 5** in Section D, Biological Resources.
[1] Santa Cruz County Zoning Designation CA (Commercial Agriculture) with "W" (Watsonville Utility Prohibition) overlay is to discourage the provision of urban services and development in the farmlands, wetlands and other environmentally sensitive areas in the Coastal Zone west of Watsonville.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2.	*Conflict with existing zoning for agricultural use, or a Williamson Act contract?*	☐	☐	☒	☐

Discussion: The County of Santa Cruz denoted parcels under Williamson Act contract with a combining district (-P) (County of Santa Cruz 2020). The proposed project does not involve any lands with the (-P) overlay and not under a Williamson Act contract. As described in the discussion above, the proposed trail use would have a less than significant impact on agricultural land. Therefore, the project does not conflict with existing zoning for agricultural use, or a Williamson Act contract. The impact would be **Less than Significant**. No mitigation would be required.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3.	*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))?*	☐	☐	☐	☒
4.	*Result in the loss of forest land or conversion of forest land to non-forest use?*	☐	☐	☐	☒

Discussion: The project is not located near land designated as Timber Resource, and no forest land occurs in the project area or in the immediate vicinity. Therefore, the project would not conflict with existing zoning or cause rezoning of forest land or timberland, and would not result in the loss of forest land or conversion of forest land to non-forest use. There would be **No Impact**.

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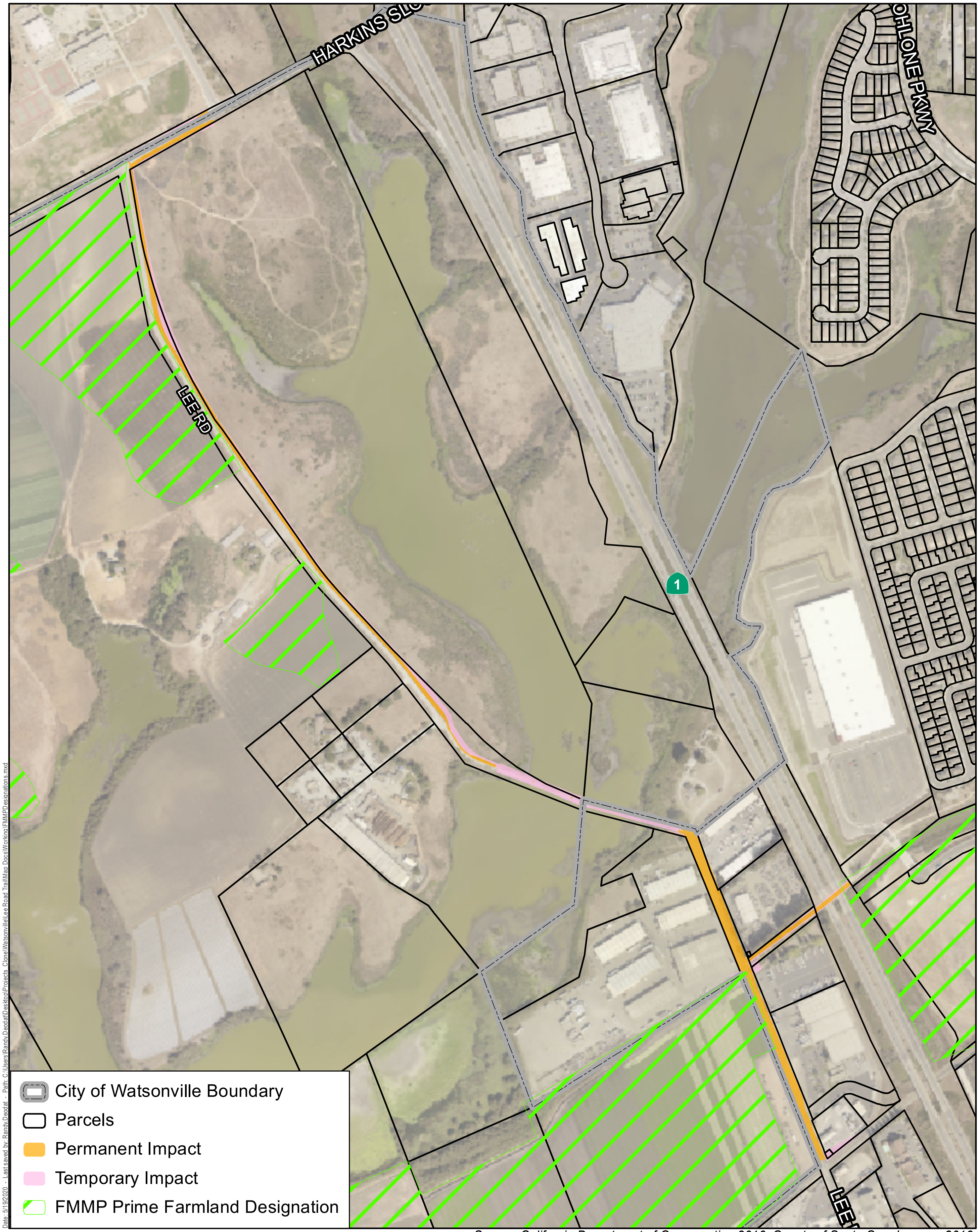

Source: California Department of Conservation 2016; County of Santa Cruz Imagery 2016.

Harris & Associates

Figure 5

Farmland Mapping and Monitoring Program Designations

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5. *Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?*	☐	☐	☒	☐

Discussion: As described under B-4 and B-5, thee project area contains no forest land, and thus the project would not result in the conversion of forest land to non-forest use. As described under B-1, the proposed trail would not convert farmland, and the impact would be **Less than Significant**. No mitigation would be required.

C. AIR QUALITY

The significance criteria established by the Monterey Bay Air Resources District (MBARD)[5] *has been relied upon to make the following determinations. Would the project:*

1. *Conflict with or obstruct implementation of the applicable air quality plan?*	☐	☐	☒	☐

Discussion: The Monterey Bay Air Resources District (MBARD) is one of 35 air districts established by the California Air Resources Board (CARB) to protect air quality in California. MBARD's jurisdiction is the North Central Coast Air Basin (NCCAB), which includes Santa Cruz County. As required by the California Clean Air Act, MBARD prepared an Air Quality Management Plan (AQMP) in 1991 with subsequent updates every three years to show how the State Ambient Air Quality Standards would be met in the NCCAB. The NCCAB does not meet state standards for ozone (reactive organic gases [ROGs] and nitrogen oxides [NOx]) and fine particulate matter (PM_{10}).

The MBARD AQMP includes an emission inventory with general estimated basin-wide construction-related emissions, which are not expected to prevent long-term attainment or maintenance of the ozone and particulate matter standards within the NCCAB. Therefore, temporary construction impacts related to air quality plans for these pollutants from the project would be less than significant, and no mitigation would be required, since they are presently estimated and accounted for in the District's emission inventory, as described below.

The increased recreational opportunity associated with the proposed project is intended to service existing Watsonville and Santa Cruz County residences. The proposed trail connects existing trail facilities to provide an improved alternative transportation route. No new parking facilities would be provided to accommodate trail visitors. Therefore, additional vehicle trips are not anticipated as a result of the project. Implementation of the project would

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[5] Formerly known as the Monterey Bay Unified Air Pollution Control District (MBUAPCD).

provide increased regional connectivity that would allow some vehicle trips to be replaced by alternative modes of transportation, such as walking and bicycling. Therefore, the proposed project would not result in conflict with the VMT assumptions of the MBARD AQMP. No stationary sources would be constructed that would be long-term permanent sources of emissions.

Therefore, impacts to regional air quality because of construction and long-term operation of the project would be **Less than Significant**. No mitigation would be required.

2. 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?	☐	☐	☒	☐

Discussion: As stated above, Santa Cruz County is located within the NCCAB, and the NCCAB does not meet state standards for ozone (ROGs and NOx) and PM_{10}. Therefore, the regional pollutants of concern that would be emitted by the project are ozone precursors and PM_{10}.

The primary sources of ROG within the air basin are on- and off-road motor vehicles, petroleum production and marketing, solvent evaporation, and prescribed burning. The primary sources of NOx are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes. In 2015, daily emissions of ROGs were estimated at 59 tons per day. Of this, area-wide sources represented 60%, mobile sources represented 23%, and stationary sources represented 17%. Daily emissions of NOx were estimated at 39 tons per day with 60% from mobile sources, 21% from stationary sources, and 11% from area-wide sources. In addition, the region is “NOx sensitive,” meaning that ozone formation due to local emissions is more limited by the availability of NOx as opposed to the availability of ROGs (MBARD 2017).

PM_{10} is the other major pollutant of concern for the NCCAB. In the NCCAB, highest particulate levels and most frequent violations occur in the coastal corridor. In this area, fugitive dust from various geological and man-made sources combines to exceed the standard. The majority of NCCAB exceedances occur at coastal sites, where sea salt is often the main factor causing exceedance. In 2005, daily emissions of PM_{10} were estimated at 102 tons per day. Of this, entrained road dust represented 35% of all PM_{10} emission, windblown dust 20%, agricultural tilling operations 15%, waste burning 17%, construction 4%, and mobile sources, industrial processes, and other sources made up 9% (MBUAPCD 2008).

Impacts

Construction

Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless be acute during construction periods, resulting in significant localized impacts to air quality. **Table 3** summarizes the threshold of significance for construction activities.

Table 3. Construction Activity with Potentially Significant Impacts from Pollutant PM_{10}

Activity	Potential Threshold*
Construction site with minimal earthmoving	8.1 acres per day
Construction site with earthmoving (grading, excavation)	2.2 acres per day

*Based on Midwest Research Institute, Improvement of Specific Emission Factors (1995). Assumes 21.75 working weekdays per month and daily watering of site.

Note: Construction projects below the screening level thresholds shown above are assumed to be below the **82 lb./day threshold of significance**, while projects with activity levels higher than those above may have a significant impact on air quality. Additional mitigation and analysis of the project impact may be necessary for those construction activities.

Source: Monterey Bay Unified Air Pollution Control District, 2008.

As required by the MBARD, construction activities (e.g., excavation, grading, on-site vehicles) which directly generate 82 pounds per day or more of PM_{10} would have a significant impact on local air quality when they are located nearby and upwind of sensitive receptors such as the community of Watsonville (**Table 3**). Construction projects below the screening level thresholds shown in **Table 2** are assumed to be below the 82 lb/day threshold of significance, while projects with activity levels higher than those thresholds may have a significant impact on air quality. The project would involve minimal grading; however, project construction emissions from Phase 1 were modeled using the CalEEMod model (Version 2016.3.2) and the construction assumptions summarized in **Table 2**. The project would be completed in three phases. As shown in **Table 4**, Phase 1 would require the most construction within the shortest time; therefore, it represents the worst-case scenario for maximum daily construction emissions. Project construction emissions are summarized in **Table 4**. Although the project would produce PM_{10}, it would be far below the 82 pounds per day threshold. This would result in less than significant impacts on air quality from the generation of PM_{10}.

Table 4. Estimated Construction Daily Maximum Air Pollutant Emissions (lbs. /day)

Construction Phase	ROG	NOx	CO	SOx	PM_{10}	PM2.5
Phase 1 Construction	3	25	17	<1	11	6
MBARD Threshold	–	–	–	–	82	–
Significant Impact?	–	–	–	–	No	–

Source: CalEEMod Version 2016.3.2. Model output provided in **Attachment C**.
Definitions: ROG = Reactive Organic Gases. NOx = Oxides of Nitrogen. CO = Carbon Monoxide. SOx. = Sulfur oxides. PM10 = Particulate matter 10 micrometers or less in diameter. PM2.5 = Particulate matter 2.5 micrometers or less in diameter.

Construction projects using typical construction equipment such as dump trucks, scrapers, bulldozers, compactors, and front-end loaders that temporarily emit precursors of ozone (i.e., ROG or NOx), are accommodated in the emission inventories of state- and federally-required air plans and would not have a significant impact on the attainment and maintenance of ozone ambient air quality standard (AAQS) (MBUAPCD 2008).

As required by law (USEPA 2020), California ultralow sulfur diesel fuel with a maximum sulfur content of 15 ppm by weight will be used in all diesel-powered equipment, which minimizes sulfur dioxide and particulate matter.

Additionally, as described in the project description, the following air quality BMPs will be implemented during all site excavation and grading.

- Water all active construction areas at least twice daily as necessary and indicated by soil and air conditions.
- Prohibit all grading during periods of high wind (over 15 mph).
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed areas.
- Haul trucks shall maintain at least 2' 0" freeboard.
- Cover all trucks hauling soil, sand, and other loose materials.
- Plant native vegetative ground cover in disturbed areas as quickly as possible.
- Cover inactive storage piles.

Implementation of the above recommended BMPs for the control of construction-related emissions would further reduce construction-related particulate emissions. These measures are not required by MBARD or as mitigation measures, as the impact would be less than significant without mitigation. These types of measures are commonly included as conditions of approval associated with development permits approved by the County.

Operation

Following construction, the proposed project would generate nominal new traffic. There is no indication that new emissions of ROGs or NOx would exceed MBARD thresholds for these pollutants; and therefore, there would not be a significant contribution to an existing air quality violation during operation.

Therefore, construction and operation impacts would be **Less than Significant**. No mitigation would be required.

| 3. *Expose sensitive receptors to substantial pollutant concentrations?* | ☐ | ☐ | ☒ | ☐ |

Discussion: The nearest sensitive receptors to the project area are two rural residences, one approximately 180 feet from the trail alignment on the south side of Struve Slough and one approximately 400 feet from the alignment on the north side of Struve Slough, and Pajaro Valley High School, located north of the alignment along Harkins Slough Road. The nearest residential neighborhood is located approximately 0.25 mile east of the project alignment, separated from the alignment by Highway 1.

Diesel exhaust contains substances (diesel particulate matter [DPM], toxic air contaminants [TACs], and mobile source air toxics [MSATs]) that are suspected carcinogens, along with pulmonary irritants and hazardous compounds, which may affect sensitive receptors such as young children, senior citizens, or those susceptible to respiratory disease. Where construction activity occurs in proximity to long-term sensitive receptors, a potential could exist for unhealthful exposure of those receptors to diesel exhaust, including residential receptors.

<u>Impacts</u>

The project is located in the City of Watsonville and unincorporated Santa Cruz County. Pajaro Valley High School classrooms are located more than 400 feet from the proposed northern terminus of the project alignment, and two residences are located within 400 feet of the construction area. Construction is anticipated to occur in three phases over a total of 27 months. However, due to the linear nature of the project, construction would only be within these distances for a portion of construction. Additionally, the total construction duration of three years is less than 5% of the 70-year maximum exposed individual criteria used for assessing public health risk due to emissions of certain air pollutants (MBUAPCD 2008).

Due to the intermittent and short-term temporary nature of construction activities, emissions of DPM, TACs, or MSATs would not be sufficient to pose a significant risk to sensitive receptors from construction equipment operations during the course of the project.

Following construction, the proposed project would not include any components that would result in new pollutant exposure. The proposed project would generate nominal new vehicle trips; therefore, it would not contribute to any potential carbon monoxide hot spots at area intersections. The project would not expose sensitive receptors to substantial pollutant concentrations during construction or operation.

Therefore, construction and operation impacts would be **Less than Significant**. No mitigation would be required.

California Environmental Quality Act (CEQA) Initial Study/Environmental Checklist	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
4. *Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*	☐	☐	☒	☐

Discussion: Land uses typically producing objectionable odors include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses that would be associated with objectionable odors. The project does not include any known sources of objectionable odors associated with the long-term operations phase.

During construction activities, only short-term, temporary odors from vehicle exhaust and construction equipment engines would occur. California ultralow sulfur diesel fuel with a maximum sulfur content of 15 ppm by weight would be used in all diesel-powered equipment, which minimizes emissions of sulfurous gases (sulfur dioxide, hydrogen sulfide, carbon disulfide, and carbonyl sulfide). As the project site is in a coastal area that contains coastal breezes off the Monterey Bay, construction-related odors would disperse and dissipate and would not cause substantial odors at the closest sensitive receptors (located approximately 100 feet north of the proposed northern terminus of the project). Construction-related odors would be short-term and would cease upon completion. Therefore, no objectionable odors are anticipated from construction activities associated with the project.

The project would not create objectionable odors affecting a substantial number of people; therefore, the project is not expected to result in significant impacts related to objectionable odors during construction or operation. The impact would be **Less than Significant**. No mitigation would be required.

D. BIOLOGICAL RESOURCES

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. *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 Wildlife, or U.S. Fish and Wildlife Service?*	☐	☒	☐	☐

Discussion: Portions of the proposed trail are located in an area of biotic concern. Designed to minimize impacts to biological resources, the trail would be positioned adjacent to the existing developed footprint of Lee Road and a short segment along Harkins Slough Road, with the following exceptions:

- a maximum 20-foot encroachment along the margins of the CDFW Reserve, including along Lee Road to accommodate the pedestrian/bicycle trail and along Harkins Slough Road to accommodate road widening necessary for the bicycle lane (Lee Road North);
- construction of the bridge on the seasonally to perennially submerged portion of Lee Road within Struve Slough (Struve Slough Bridge);
- replacement of the channelized Watsonville Slough culvert under Lee Road (Lee Road South); and
- adding chip seal to the existing unpaved trail, between Lee Road and under the Highway 1 underpass along channelized Watsonville Slough, to connect with the Manabe-Ow Trail (Watsonville Slough).

A biotic report was prepared for this project by EcoSystems West, dated October 2020 (EcoSystems West 2020a). This report has been reviewed and accepted by the Planning Department Environmental Section. The potential impacts and mitigation measures identified in the biotic report have been incorporated into this section of the IS/MND. Refer to the biotic report for additional detail (**Attachment D**).

The County developed Conditions of Approval that are consistent with the mitigation measures identified in the biotic report and further mitigate potential impacts. The County's approval letter with the Conditions of Approval are also included in **Attachment D**.

Study Area

The Study Area evaluated in the biotic report includes the approximately 50.7-acre linear area surrounding the proposed 1.4-mile-long trail. It extends from near the Pajaro Valley High School driveway (near the Harkins Slough Road/Lee Road intersection) on the north end, along Lee Road to the south-southeast, southeast across Struve Slough, and along Lee Road south-southeast to the railroad crossing on the south end. There is a spur trail along the north side of the channelized section of Watsonville Slough, from Lee Road through the Highway 1 underpass, connecting to the existing Manabe-Ow trail system. The Study Area includes the proposed trail and an approximately 150-foot buffer on either side.

The Study Area is mostly flat to gently sloping with a slight rise in elevation along the edge of the CDFW Watsonville Slough Ecological Reserve (Reserve) near Struve Slough. In general, the trail is proposed to occur along the existing roadway and, as such, is largely within or adjacent to the developed footprint of the roadway and shoulder on the north side of Struve Slough, and within the industrial developed footprint on the south side of Struve Slough. A bridge would be constructed on the existing seasonally- to perennially-submerged Lee Road within Struve Slough.

The biotic report determined that no special-status plant species were observed during 2019 and 2020 surveys or are expected to occur within the Study Area. The following sensitive wildlife species are present or have potential to occur within the Study Area: California red-legged frog, western pond turtle, northern harrier, white-tailed kite, bald eagle, western burrowing owl (wintering or winter migrant only), tri-colored blackbird (non-breeding), grasshopper sparrow, Lawrence's goldfinch, oak titmouse, and San Francisco dusky-footed woodrat. Birds of prey, other common bird species, and common bat species are likely to utilize the Study Area for breeding. An overview of these wildlife species has been provided below, with more detail in the biotic report (**Attachment D**).

Potential project-related impacts are described in the Impacts discussion. The avoidance and minimization measures identified in the biotic report for the protection of these species and/or their habitat, as well as the conditions of approval in the County biotic approval letter, have been incorporated into the mitigation measures below to reduce project related impacts to less than significant.

Botany

As stated above, no sensitive plant species were identified or are expected to occur within the study area; therefore, the project would result in no impacts to sensitive plant species. The BMPs for biological resources described in the project description would further reduce impacts to native vegetation.

Sensitive Wildlife Species

California Red-Legged Frog

The California red-legged frog (CRLF) is listed as threatened under the federal Endangered Species Act (USFWS 1996) and is a California Species of Special Concern (Thompson et al. 2016, CDFW 2020). The CRLF is known to utilize the aquatic habitats within and near the Study Area and may utilize the adjacent upland, movement, and/or dispersal habitats. The proposed Trail alignment is located within Critical Habitat for CRLF (USFWS 2010).

To avoid unlawful "take" of CRLF, during project permitting under Section 404 of the Clean Water Act, it is anticipated that the U.S. Army Corps of Engineers (USACE) will initiate formal consultation with U.S. Fish and Wildlife Service (USFWS). This biotic assessment will be provided to USFWS at that time. We anticipate that USFWS will generate a Biological Opinion (BO) for the project under Section 7 of the Endangered Species Act; or the revised programmatic BO between the USACE and USFWS may be applicable. It is expected that the BO will describe protective measures and conditions for the Project, including the conditions for a USFWS-approved biologist to handle and relocate CRLF that move into the Project Area. With the approval of USFWS, the biologist will identify relocation sites for CRLF. The Biological Opinion will also address trail operation and associated potential impacts.

Western Pond Turtle

The western pond (WPT) is a CDFW Species of Special Concern (CDFW 2020, Thompson et al. 2016). The WPT is known to occur in Struve Slough (CNDDB 2019a, b). In 2020, a gravid female was found on Main Street by Struve Slough and was relocated back into Struve Slough with suitable nesting habitat nearby (Reis 2020). This species is also known from Pinto Lake and the Pajaro River (Mori 2018; CNDDB 2019a, b). West Branch Struve Slough, Struve Slough, and adjacent uplands provide suitable habitat for this species. If present, WPT could use Struve Slough for foraging, basking, and movement and the grasslands north and east of West Struve Slough in the CDFW Reserve for nesting.

Birds/Avian Species

Both sensitive and common avian species, such as those species listed in Appendix D of the biotic report (**Attachment D**), are likely to utilize the habitats of the Study Area and the surrounding area for nesting activities. The northern harrier and grasshopper sparrow (if present) may utilize the non-native grasslands within the CDFW Reserve for breeding. The bald eagle, the white-tailed kite, and other raptors, including owls, may utilize larger trees near the Study Area for nesting. The Lawrence's goldfinch may utilize riparian trees or coastal scrub. The oak titmouse may nest within the Study Area in trees or posts with cavities. The grasslands, coastal scrub, riparian, marsh, and non-native forest habitats within the Study Area all provide potential nesting habitat for common avian species. The western burrowing owl may utilize the CDFW Reserve grasslands for wintering or may occur as a winter migrant; however, construction along the Reserve would be restricted to the dry season (April 15 – October 15) and is therefore unlikely to impact this species. The tricolored blackbird may occur within West Branch Struve Slough, Struve Slough, or Watsonville Slough outside of breeding season.

Breeding bird season is typically February 1 to August 31. All nesting birds of prey (i.e., hawks and owls), other native nesting birds and their occupied nests, and individual birds of prey and passerine birds are protected by the California Fish and Game Commission Code (CFGC) (§ 3503 and 3503.5). Sensitive bird species receive additional protections, primarily for nesting activities with some species (such as "Fully Protected" species) receiving additional protection for wintering and foraging activities.

San Francisco Dusky-Footed Woodrat

The San Francisco dusky-footed woodrat is considered a CDFW Species of Special Concern (Bolster 1998, CDFW 2019). During field surveys, no woodrat houses were identified in the immediate Project Area. However, coastal scrub and arroyo willow riparian scrub habitats, especially those adjacent to aquatic features and other edge habitats, provide potential habitat for this species.

Bats

Common bats may also utilize non-native forest and mature riparian habitats for roosting. Bat maternity roosting occurs typically between May 1 and September 1, and winter hibernacula (shelter occupied during the winter by a dormant animal) for many bat species are found between November 1 and February 15. All roosting bats, including individual roosts, winter hibernacula, and maternity roosts, are protected under California Fish and Game Codes (2016).

Impacts

Impact BIO-1A: The project could result in adverse effects to California red-legged frog during construction and operation.

Construction

The proposed Project may result in impacts to CRLF during trail construction, including grubbing and vegetation removal, grading, work within and adjacent to Struve Slough, and equipment and vehicle access.

Work occurring directly in CRLF habitat may temporarily reduce available CRLF habitat in Struve Slough, non-native grassland and coastal scrub associated with the CDFW Reserve, riparian and marsh habitats. Work occurring directly in Struve Slough and Watsonville Slough may result in direct take of CRLF or temporarily disrupt potential CRLF in the slough through increased noise levels, vibrational, and visual disturbances and barriers to movement.

Construction activities within the sloughs would occur during the dry season, when the water level is lowest. Dewatering of Struve Slough for up to 3 to 4 months is anticipated to be necessary in order to install the bridge piers. Approximately 50% of the existing asphalt would be removed to construct the bridge supports. Clean gravel with passive gravity culverts would be placed on top of the existing roadway within the Slough. Wildlife passage may be possible through the culverts, but aquatic movement of CRLF through Struve Slough, if present, is expected to be disrupted. This species would be able to cross the gravel bar for passage, but may be more vulnerable to predation (the gravel bar would be connected to terrestrial areas on each side of the slough and would lack protective cover). In addition, construction activities may temporarily degrade potential CRLF habitat in and adjacent to the construction footprint through the introduction of sediment and potential unanticipated releases of equipment fuel, hydraulic fluid, or other potentially hazardous substances used in construction equipment; and through vegetation removal, grubbing, and disturbance in aquatic, upland and dispersal habitats.

CRLF may move through the Project Area during Trail construction, including across Lee Road. Construction equipment, grading, and earth moving could cause direct injury or mortality to CRLF, as well as harassment though increased noise levels, vibrational, and visual disturbances, and barriers to movement and dispersal. These activities could interfere with important CRLF life events, including movement to breeding habitat, breeding, foraging, dispersal, and movement to aquatic non-breeding habitats.

Implementation of the, erosion and sediment control measures during construction, which are included as part of the proposed project (refer to Best Management Practices in the project description), and the additional mitigation measures listed below would reduce sediment and chemical-laden runoff introductions and the potential construction-related impacts to CRLF and habitat to a less than significant level.

Operation

The proposed Trail would introduce increased pedestrian and bicycle use, as well as unauthorized access into the east side of the CDFW Reserve. It could also result in increased vehicle traffic, more likely on the weekend when the trail is expected to be used more by recreationists, rather than students traveling to Pajaro Valley High School. Increased presence of vehicles and trail users may result in increased harassment, injury, and mortality of CRLF through trampling, vehicle and bicycle strikes, and interference with CRLF movement, dispersal, and other life events. Currently unpermitted access is mostly confined to the west side of the Reserve near the Highway 1 overpasses. New easier access to the east side of CDFW Reserve via the proposed Struve Slough Bridge could increase unpermitted access to the Reserve and illegal encampments, particularly in the areas that provide shelter such as the coastal scrub and riparian habitats.

The increased human presence through trail use and unauthorized access is likely to degrade CRLF habitat through trampling, compaction of small mammal burrows, alteration of the native vegetation, increased trash, urine and fecal matter, and pollution of aquatic habitat. On-going maintenance activities along the alignment, such as mowing, pruning, and trail repair could also result in direct impacts to CRLF and Critical Habitat.

As described in the project description under Trail Operations and Maintenance, the project includes several measures intended to protect natural resources. Regular patrol by local law enforcement and regular maintenance visits by City of Watsonville Public Works Department would deter and reduce unpermitted access and degradation of CRLF habitat. Parking restrictions along the Lee Road North section, with signage that prohibits parking or limits parking to day time hours along the roadway, would minimize vehicle strikes of CRLF along Lee Road. Mowing and pruning would be restricted the dry season (typically between April 15 and October 15). Additional measures to protect CRLF are needed to reduce this impact to a less than significant level.

Therefore, the potential construction and operation impacts would be **Less than Significant with Mitigation**.

Mitigation Measure

BIO-1: **CRLF Protection Measures during Construction.** During project construction activities, the City shall ensure the following avoidance measures and biological monitoring will be implemented to protect the California red-legged frog (CRLF) and other sensitive wildlife species.

a. Prior to initiation of construction activities, a USFWS- and CDFW-approved biologist shall prepare a construction monitoring plan that identifies all areas to be protected with exclusion fencing on a 1:1500 scale map (or similar scale determined to be practicable), and all areas requiring monitoring by a USFWS- and CDFW-approved biologist.

b. Prior to initiation of construction activities, the agency-approved biologist shall conduct an environmental training for all construction personnel. The training shall include a description of CRLF and its habitat, and measures to protect CRLF, and other sensitive wildlife species known or with potential to occur (WPT, nesting avian species, San Francisco dusky-footed woodrat, and roosting bats) in the Project alignments and surroundings.

c. Prior to initiation of construction activities, the construction contractor shall install exclusion fencing (solid silt fencing) in specified areas along the project boundaries, 2.0 feet below grade and 3.0 feet above grade, with wooden stakes at intervals of not more than 5.0 feet. The fence shall be maintained in working order for the duration of construction activities. The agency-approved biologist or designated trained construction monitor shall inspect the fence daily and notify the construction foreman when fence maintenance is required. The fence shall allow for wildlife passage across the Project Area at intervals to be determined in conjunction with USFWS and CDFW.

d. If feasible, construction activities within and adjacent to the CDFW Reserve, Struve Slough, and Watsonville Slough shall take place during the dry season and before the first rain of the season, especially vegetation removal and work in or near Struve Slough. Avoid working at night or during rain events when special-status amphibians and mammals are generally more active. Consult weather forecasts from the National Weather Service at least 72 hours prior to performing work.

e. During vegetation removal in or adjacent to the CDFW Reserve and construction within or adjacent to Struve Slough and Watsonville Slough, with the authorization of the USFWS and CDFW, the agency-approved biological monitor will be present (or on call) to relocate CRLF (and WPT) as needed. The approved biologist shall have the authority to stop work that may result in the "take" of a special-status species.

The biologist will thoroughly check all vegetation for CRLF, WPT, and other wildlife species prior to vegetation removal activities.

f. The approved biologist or construction monitor will check under all equipment for wildlife before use. If any special-status wildlife is observed under equipment or within the work area, the approved biologist will be permitted to handle and relocate it.

g. At the end of each work day, excavations shall be secured with a cover, or a ramp installed to prevent wildlife entrapment.

h. All trenches, pipes, culverts or similar structures shall be inspected for animals prior to burying, capping, moving, or filling.

Mitigation Measure

BIO-2: **Conceptual Mitigation Plan for California Red Legged Frog and Other Sensitive Resources.** To minimize take of CRLF and degradation of its habitat during trail operation, the City will retain an agency-approved biologist to develop a Conceptual Mitigation Plan (CMP) for CRLF and other sensitive resources. The details of the CMP will be developed in consultation with USFWS and CDFW, with input from collaborative partners Watsonville Wetlands Watch and, if determined to be appropriate and beneficial, the Land Trust of Santa Cruz County. The CMP will include the following components.

a. Identification and mapping of occupied and potential CRLF aquatic (breeding and non-breeding), upland, refuge, movement, and dispersal habitat within and adjacent to the CDFW Reserve, proposed Struve Slough Bridge crossing, and channelized Watsonville Slough.

b. Strategies to protect these areas from take of individual CRLF or degradation associated with trail operation.

c. Monitoring of CRLF habitat (at a frequency to be determined in consultation with the agencies) by an agency-approved biologist to ensure degradation of habitat is not occurring. The monitor will confirm that protective maintenance measures are being implemented, including restricting mowing and pruning to the dry season (typically from April 15 to October 15).

d. Adaptive management strategies to modify and/or supplement existing mitigation measures, in the event that the monitoring biologist identifies degradation of CRLF habitat.

e. Humane removal of non-native predators in off-channel ponds or other potential breeding ponds lacking direct connection to the larger slough system.

f. Communication protocol for local law enforcement and public works representatives to enforce parking restrictions along Lee Road and immediately alert Watsonville Wetlands Watch, CDFW Reserve Representatives, and/or the assigned monitoring biologist in the event that illegal encampments or other degradation of CRLF habitat is observed.

For efficiency, this CMP for CRLF protection could be integrated with the CMP developed to mitigate impacts to sensitive habitats and displaced wetlands (described in Mitigation Measures BIO-7 and BIO-10, respectively), such as creation or enhancement of off-channel breeding habitat within the CDFW Reserve or on Watsonville Slough Farm, and planting of adjacent refuge habitat with native vegetation.

Impact BIO-1B: The proposed Project may result in temporary impacts to Western Pond Turtle (WPT), if present, during trail construction, including grubbing and vegetation removal, grading, work within and adjacent to Struve Slough, and equipment and vehicle access.

Work occurring directly in Struve Slough may temporarily disrupt potential WPT basking, foraging and movement in the slough through increased noise levels, vibrational, and visual disturbances, and barriers to movement. Construction activities within the slough would occur during the dry season, when the water level is lowest; however, dewatering of Struve Slough for up to 3-4 months is anticipated to be necessary in order to install the bridge piers. Clean gravel with passive gravity culverts would be placed on top of the existing roadway within the Slough. Wildlife passage may be possible through the culverts, but aquatic movement of WPT through Struve Slough, if present, is expected to be disrupted. This species would be able to cross the gravel bar for passage, but may be more vulnerable to predation (the gravel bar would be connected to terrestrial areas on each side of the slough and would lack protective cover). In addition, construction activities would temporarily degrade potential WPT habitat in and adjacent to the construction footprint through the introduction of sediment and potential unanticipated releases of equipment fuel, hydraulic fluid, or other potentially hazardous substances used in construction equipment.

If present in West Branch Struve Slough, female WPT may move through the Project Area during construction, although movement in this direction is unlikely based on the poor quality of potential nesting habitat. Construction equipment, grading, and earth moving could cause direct injury or mortality to WPT, as well as harassment though increased noise levels, vibrational, and visual disturbances, and barriers to movement and dispersal. These activities could interfere with WPT breeding.

Trail operation is not expected to interfere with WPT life events based on the location of the trail along Lee Road where minimal if any WPT upland movement would occur. The proposed bridge would provide a safe viewing platform for trail users that is above Struve Slough and is not expected to interfere with WPT basking or movement.

As described in the project description under Best Management Practices, erosion and sediment control measures would be implemented during construction, which would reduce sediment and chemical-laden runoff introductions. Implementation of these BMPs, together with mitigation measures BIO-1 to BIO-4 required for CRLF, would reduce the potential construction-related impacts to WPT and habitat to **Less than Significant**. No mitigation would be required.

Impact BIO-1C: Project construction activities during the avian breeding season (from February 1 to August 31) may disrupt breeding activities, cause nest abandonment or failure, or directly harm or cause mortality to nesting birds, eggs, and young located within the project area and surroundings. Limited scrub and grassland removal may result in direct harm or mortality to nesting avian species and loss of potential nesting habitat.

Construction activities, including grubbing and vegetation removal, grading/earth moving, excavation, and equipment and vehicle access would generate increased dust, noise, and vibrational and visual disturbances. These activities may disrupt sensitive and common bird species nesting within the Study Area. Construction activities may also injure or kill wintering or winter migrant burrowing owls, if present, and destroy fossorial mammal burrows that provide potential wintering habitat. Implementation of the following measures would be required to reduce this impact to a less than significant level. Therefore, this impact would be **Less than Significant with Mitigation**.

Mitigation Measure

BIO-3: **Nesting Bird Protection Measures.** To protect nesting birds, the City in coordination with the construction contractor and a qualified biologist, will implement the following avian protection measures prior to and during construction.

a. The avian breeding season occurs between February 1 and August 31. If feasible, perform vegetation removal activities within or near the CDFW Reserve and along Watsonville Slough outside of breeding bird season to avoid direct harm or mortality to potential nesting bird species and other sensitive biological resources.

b. For all project activities initiated during the breeding bird season, or if construction activities lapse for a period of two weeks or more during breeding bird season, a qualified biologist will conduct a breeding bird survey for nesting birds, including raptors. Surveys will be conducted within 15 days prior to beginning project activities and will include all work, staging, and access areas and a minimum buffer radius of 400 meters (or more as determined by the resource agencies). The survey will include potential habitat for sensitive and common raptors and other nesting avian species known to occur within the Study Area (grassland, coastal scrub, arroyo willow riparian, freshwater marsh, non-native forest/eucalyptus grove).

c. If no nesting sensitive or common avian species are observed during breeding bird surveys no additional measures will be required.

d. If common nesting birds are observed within or adjacent to (within 90 meters or 300 feet) vegetation proposed for removal, vegetation removal activities will be postponed until young have fledged to avoid direct harm or mortality of nesting birds and/or establish buffers depending on the activity and appropriate to the species, as determined by the qualified biologist.

e. Sensitive bird species, if nesting in or near the Project Area, will be given special consideration and may require additional protective measures as determined through consultation with the relevant agency (USFWS or CDFW), such as protective buffers:
   - bald eagle: 400 meters (1,300 feet)
   - northern harrier, white-tailed kite, and other raptors: 90 meters (300 feet)
   - lawrence's goldfinch, grasshopper sparrow: 25 meters (75 feet)
   - oak titmouse: 15 meters (50 feet)

f. Destruction of fossorial mammal burrows will be avoided to the greatest extent feasible.

g. If any work is performed within or adjacent to the CFDW Reserve, Struve Slough, or Watsonville Slough during the burrowing owl and tricolored blackbird wintering period (from November to March), a qualified burrowing owl biologist will conduct a survey for these species and include the project area and suitable habitat within 150 meters (490 feet). A qualified burrowing owl biologist will have: 1) familiarity with the species and its local ecology; 2) experience conducing habitat assessments and non-breeding and breeding season surveys, or experience with these surveys conducted under the direction of an experienced surveyor; 3) familiarity with the appropriate state and federal statutes related to burrowing owls, scientific research, and conservation; and 4) experience with analyzing impacts of development on burrowing owls and their habitat. If burrowing owls are detected:
   - place visible markers near occupied burrows and fence off suitable habitat;
   - avoid direct destruction of burrows, and
   - include the burrowing owl in the environmental training for construction personnel.

Impact BIO-1D: The project could directly impact individual San Francisco dusky-footed woodrats or their houses if removal of coastal scrub and arroyo willow riparian is determined to be necessary. Construction activities associated with the proposed Trail through the CDFW Reserve and near Struve Slough may directly impact woodrat individuals if present within the work area. Protection measures would reduce this impact to a less than significant level. Additionally, implementation of Mitigation Measures BIO-1 to BIO-4 for CRLF impacts would protect the woodrat. Therefore, this impact would be **Less than Significant with Mitigation**.

Mitigation Measure

BIO-4: **San Francisco Dusky-Footed Woodrat Protection Measures.** To protect San Francisco dusky-footed woodrat, the City in coordination with the construction contractor and a qualified biologist, will implement the following protection measures prior to and during construction.

a. Prior to construction, a qualified biologist shall conduct a preconstruction survey for woodrat houses, and clearly flag all houses within the construction impact area and immediate surroundings.

b. The construction contractor shall avoid woodrat houses to the extent feasible by installing a minimum 10-foot (preferably 25-foot) buffer with silt fencing or other material that shall prohibit encroachment. If this buffer and avoidance is not feasible, the qualified biologist shall allow encroachment into the buffer, but retain microhabitat conditions such as shade, cover and adjacent food sources.

c. If avoidance of woodrat houses is not possible, in coordination with CDFW, a qualified biologist shall develop and implement a San Francisco Dusky-footed Woodrat Relocation Plan (an example is provided in Appendix F of the Biotic Report, **Attachment D**).

Impact BIO-1E: Tree and vegetation removal and pruning may harm roosting bats. One large (72-inch DBH) eucalyptus tree is proposed for removal to allow installation of the proposed southern Struve Slough Bridge approach. In addition, up to 0.017 acres of arroyo willow riparian adjacent to the southern bridge approach would be removed and up to 0.031 acres would be limbed or pruned to allow access for the construction of the piers, bridge abutments and the bridge. If roosting bats are present in trees proposed for pruning, limbing or removal, direct harm or mortality of bats may occur. Noise, vibrations, dust, and other disturbances associated with trail construction activities may disrupt bat maternity roosts, if present. Impacts to potential roosting bats would be reduced to a less than significant level by implementing protection measures for roosting bats and habitat enhancement with native trees and vegetation. Therefore, this impact would be **Less than Significant with Mitigation**.

Mitigation Measure

BIO-5: **Roosting Bat Protection Measures.** To protect roosting bats, the City, in coordination with the construction contractor and a qualified biologist, will implement the following protection measures to protect maternity roosts, individual roosts and winter hibernacula prior to and during construction.

a. If feasible, conduct limbing/tree removal operations between September 15 and November 1 to avoid bat maternity roosts and winter hibernacula, as well as other sensitive biological resources.

b. During all months, prior to limbing/tree removal, a qualified biologist shall conduct a pre-construction survey for bats to determine if crevice or foliage roosting bats are present, as follows:

- a qualified biologist shall determine if bats are utilizing the site for roosting. For any trees/snags that could provide roosting space for cavity or foliage-roosting bats, potential bat roost features shall be thoroughly evaluated to determine if bats are present. Visual inspection and/or acoustic surveys shall be utilized as initial techniques. If roosting bats are found, the biologist shall develop and implement acceptable passive exclusion methods in coordination with or based on CDFW recommendations. If feasible, exclusion shall take place during the appropriate windows (between September 1 and November 1) to avoid harming bat maternity roosts and/or winter hibernacula. (Authorization from CDFW is required to evict winter hibernacula for bats).
- if established maternity colonies are found, in coordination with CDFW, a buffer shall be established around the colony to protect pre-volant young from construction disturbances until the young can fly; or implement other measures acceptable to CDFW.
- if a tree is determined not to be an active roost site for roosting bats, it may be immediately limbed or removed as follows: If foliage roosting bats are determined to be present, limbs shall be lowered, inspected for bats by a bat biologist, and chipped immediately or moved to a dump site. Alternately, limbs may be lowered and left on the ground until the following day, when they can be chipped or moved to a dump site. No logs or tree sections shall be dropped on downed limbs or limb piles that have not been in place since the previous day.
- if the tree is not limbed or removed within four days of the survey, the survey efforts shall be repeated.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. Have a substantial adverse effect on any riparian habitat or sensitive natural community identified in local or regional plans, policies, regulations (e.g., wetland, native grassland, special forests, intertidal zone, etc.) or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐

Discussion: As stated above, the information in this section is based on the biotic report prepared by EcoSystems West 2020 (EcoSystems West 2020a) (**Attachment D**).

Study Area

Four sensitive habitats, (coastal scrub, palustrine emergent wetland, arroyo willow riparian forest, and aquatic) occur within the Study Area. The Study Area also includes habitats that support sensitive wildlife species, such as CRLF (aquatic habitat and upland, movement and dispersal habitat adjacent to aquatic habitat), San Francisco dusky-footed woodrat and special-status bird species; and areas of high biological diversity, such as edge habitats. Within the Study Area, edge habitats occur between coastal scrub and non-native grassland habitats on the CDFW Reserve and along the edge of arroyo willow riparian habitat east of Struve Slough. **Figure 6** depicts habitat types, including sensitive habitats, within the Study Area for the project.

The temporary and permanent impacts by habitat type are summarized in **Table 5**, and the sensitive habitat types are shown in bold.

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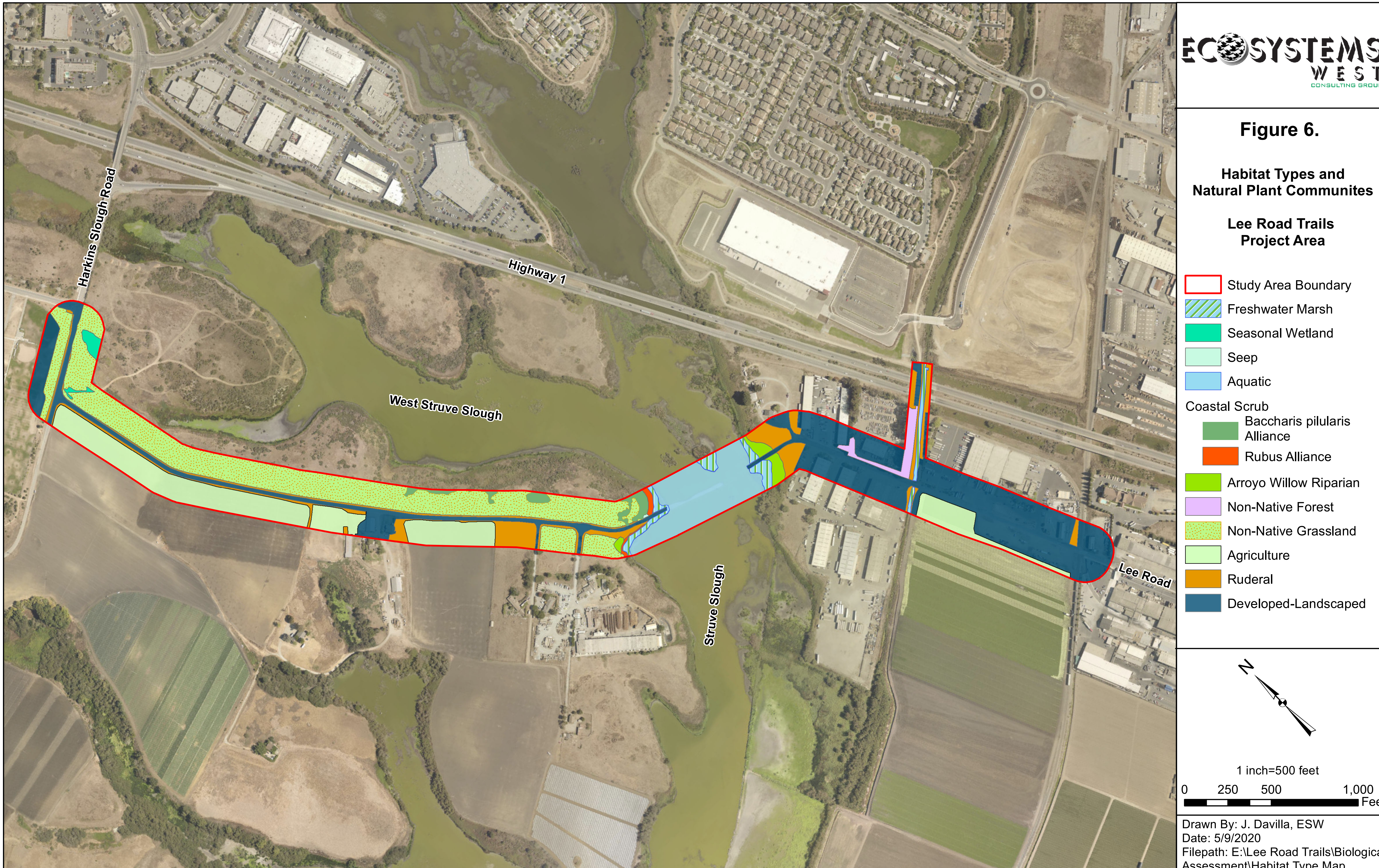

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Table 5. Lee Road Trail Permanent and Temporary Habitat Impacts

Habitat Type	Proposed Project			
	Permanent Impacts	Temporary Impacts		
Agriculture	0	0		
Aquatic	**0.003**	**0.497**		
Arroyo Willow Riparian	**0.017**	**0.031**		
Coastal Scrub (Baccharis pilularis Alliance)	**0.077**	**0.013**		
Coastal Scrub (Rubus Alliance)	**0**	**0.015**		
Developed-Landscaped	2.219	0.219		
Freshwater Marsh	**0.017**	**0.121**		
Non-native Forest	0.188*	0.091		
Non-native Grassland	1.384	1.057		
Ruderal	0.226	0.697		
Seasonal Wetland	**0.005**	**0.009**		
Seep	**0.001-0.010****	**0-0.010**		
Total	4.136	2.761		
Total Sensitive Habitats	**0.120-0.129**	**0.686-0.696**		

Note: Sensitive Habitats are in **bold**
*****Permanent impact from trail construction is largely located below the canopy of existing trees along Watsonville Slough and may require periodic trimming and/or maintenance but will not require the full removal of any trees.
** Lower acreage total reflects direct construction-related disturbance. The larger acreage reflects potential direct impacts to wetland hydrology resulting from the proposed bioswale upslope of the existing seep. The bioswale may intercept sufficient surface water flows to impede long-term hydrological functioning the seep.

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A description of potential impacts to coastal scrub and arroyo willow riparian forest is provided below, and potential impacts to wetlands and other waters are described in the subsequent section.

Coastal scrub is considered ESHA by the County of Santa Cruz Local Coastal Program (LCP) (Santa Cruz County 1994) and County of Santa Cruz sensitive habitat (Santa Cruz County Code 16.32). The *Rubus* Alliance (Coast brambles; G4/S3) is also considered a sensitive habitat by CDFW. Within the Study Area, coastal scrub is located primarily on ridgetops and east facing slopes above West Struve Slough within the CDFW Reserve.

Arroyo willow riparian forest is considered an ESHA and sensitive habitat type by the County of Santa Cruz LCP, Sensitive Habitat Ordinance, and Riparian Corridor and Wetlands Protection Ordinance (Santa Cruz County Code 16.30) (the latter discussed in further detail in the subsequent section). The *Salix lasiolepis* Association (62.201.01) is also described as a sensitive natural community by CDFW. These areas are regulated as wetland habitats by the California Coastal Commission due to dominance by arroyo willow, a facultative wetland (FACW) species. Riparian communities are considered sensitive habitat due to their value to wildlife, limited distribution, and decreasing acreages statewide.

The County of Santa Cruz Sensitive Habitat Protection ordinance requires mitigation for any unavoidable environmental impacts to sensitive habitats, including degradation, caused by the project. The avoidance and minimization measures identified in the biotic report for the protection of these sensitive habitats have been incorporated into the mitigation measures identified below to reduce project related impacts to less than significant.

<u>Impacts</u>

Impact BIO-2: Trail construction and operation may adversely affect riparian habitat and sensitive natural communities.

Construction

Construction of the proposed Trail could result in the temporary and permanent loss of sensitive habitats, as described below.

Coastal Scrub. Coastal scrub is present on the CDFW Reserve. Project construction would permanently impact 0.077 acres (3,350 square feet) of coastal scrub (*Baccharis pilularis* Alliance). Construction disturbance would temporarily impact an additional 0.044 acres (1,900 square feet) of coastal scrub (*Rubus* Alliance) during equipment access, grubbing, vegetation removal, excavation, grading, and trail construction. To mitigation these impacts to a less than significant level, vegetation removed for construction would be replaced in-kind onsite, and permanent vegetation loss would be mitigated through in-kind replacement or enhancement in close proximity to the area of disturbance.

Arroyo Willow Riparian Habitat. Arroyo willow riparian habitat occurs at the southern margins of Struve Slough. Approximately 0.017 acres (740 square feet) of arroyo willow riparian forest is anticipated to be permanently displaced by the proposed project. Construction disturbance would temporarily impact 0.031 acres (1,350 square feet) of arroyo willow riparian habitat. During construction of the Struve Slough Bridge, activities such staging, equipment access, construction of temporary access roads, construction of bridge abutments and construction of the bridge approaches may result in temporary disturbances to arroyo willow riparian, largely limited to pruning or limbing to allow for access. Some grubbing or grading may be required. If severely pruned or limited, it is anticipated that arroyo willow riparian vegetation would re-sprout from the stumps and roots. The impact would be mitigated to a less than significant level with in-kind replacement or enhancement.

CRLF Habitat. Upland habitats that may support CRLF refuge, movement, and dispersal include those sensitive habitats listed, above as well as non-native grassland and fallow agricultural fields. Impacts to potential CRLF habitat and mitigation are described in **Impact BIO-1A** above.

Edge Habitats/Habitats of High Biological Diversity. Within the Study Area, edge habitats occur on the CDFW Reserve between coastal scrub and non-native grassland habitats and along the edge of arroyo willow riparian habitat east of Struve Slough. Minimal to no direct impacts to edge habitats are anticipated as a result of the project. Temporary disturbance to edge habitats may result trail construction in these areas. Equipment access, grubbing, vegetation removal, excavation, grading, and trail construction may result in temporary disturbance to edge habitats. If permanent loss occurs, this impact would be mitigated through in-kind replacement or enhancement in close proximity to the area of disturbance.

Additionally, construction of the proposed trail would result in the permanent loss of 1.66 acres of open space along the western edge of the CDFW Reserve, where the trail is proposed to be located. The open space that would be displaced consists of a narrow strip of land (approximately 20 feet in width) comprised of non-native grassland along Lee Road. Non-native grassland is not a sensitive habitat; however, this area serves as a buffer to the sensitive habitats located further east within the CDFW Reserve. As noted above, non-native grassland provides important edge habitat when located immediately adjacent to sensitive coastal scrub habitat. In addition, losing a portion of this buffer habitat reduces the overall open space of the Reserve.

While the loss of open space would not be considered a significant impact under CEQA, CDFW has recommended analysis of impacts to buffers and mitigation for those impacts as a condition of approval (i.e., granting an easement on the CDFW Reserve). Therefore, loss of the non-native grassland open space buffer along the edge of the Reserve is included in Mitigation Measure BIO-7, Conceptual Mitigation Plan (CMP). The CMP is required to mitigate other project impacts, and to minimize the degradation of sensitive habitats from project construction and operation. Therefore, construction impacts to sensitive habitats would be **Less than Significant with Mitigation**.

Operation

The proposed Trail would introduce increased pedestrian and bicycle use along the east side CDFW Reserve, as well as the potential for unauthorized access into the Reserve. Currently unpermitted access is mostly confined to the west side of the Reserve near the Highway 1 overpasses. New easier access to the east side of CDFW Reserve via the proposed Struve Slough Bridge is likely to increase unauthorized access to the Reserve and illegal encampments, particularly in the areas that provide shelter such as the coastal scrub and riparian habitats. The increased human presence through trail use and unauthorized access is likely to deter wildlife and degrade sensitive habitats, including edge habitats, through introduction of additional invasive weeds, trampling, compaction, alteration of the native vegetation, construction of shelters, increased trash, urine and fecal matter, and pollution of aquatic habitat.

Regular patrol by local law enforcement and regular maintenance visits, as described in the project description, would deter and reduce unpermitted access and degradation of sensitive habitat. The fencing along the trail would include thorny native vegetation, such as California blackberry and wild rose, to deter trespassing into the Reserve. Additional sensitive habitat protection measures would be required to reduce potential impacts to a less than significant level. Therefore, the permanent impacts would be **Less than Significant with Mitigation**.

Mitigation Measure

BIO-6: **Sensitive Habitat Protection Measures during Construction.** To protect sensitive habitat, the City in coordination with the construction contractor and a qualified biologist, will implement the following protection measures prior to and during construction.

a. Minimize the construction footprint, including removal or disturbance of existing vegetation, as feasible.
b. Stage equipment in ruderal and developed areas only.
c. Confine project activities and operation of equipment and vehicles, including site access and parking, to designated staging areas to the greatest extent feasible.
d. Within the CDFW Reserve, access the trail alignment from the Lee Road side to the greatest extent feasible.
e. Fence off coastal scrub and other sensitive habitats to prevent encroachment, and protect edge habitats wherever feasible.
f. Avoid grubbing and construction within 100 feet of the edge of sensitive habitats, where feasible.

g. Restrict and minimize access roads into Struve Slough to the greatest extent feasible.

h. Clean all equipment caked with mud, soils, or debris from offsite sources or previous project sites prior to staging equipment on site to avoid introducing or spreading invasive exotic plant species into the adjacent remaining habitats. All equipment used on the premises should be cleaned prior to leaving the site for future projects.

i. Revegetate coastal scrub and arroyo willow riparian forest that is temporary or permanently removed, so there is no net loss, with locally-sourced native plantings. Adjacent non-native grassland and ruderal habitats may also be planted with native vegetation, preserving edge effects, where appropriate.

j. Upon project completion, areas remaining outside the project footprint will be planted with a planting palate of suitable native species. This will include using a native seed mix and container plants where appropriate. The native seed mix will be developed in coordination with Watsonville Wetlands Watch and CDFW to ensure proper species selection and application rates. Sterile barley or wheat may be used as erosion control in the first year following disturbance but the seed must have a minimum purity of 95 percent and 85 percent germination rate. A preliminary seed mix recommended for revegetation is included in Appendix H of the biotic report in **Attachment D**.

k. In areas within, outside and adjacent to the project footprint, remove invasive species, particularly those designated by Cal-IPC as having moderate to high potential for "severe ecological impacts on physical processes, plant and animal communities, and vegetation structure".

l. Where temporary impacts to sensitive habitats (e.g., coastal scrub or arroyo willow riparian forest) occur, re-vegetate as needed with locally-sourced native plantings. Adjacent non-native grassland and ruderal habitats may also be planted with native vegetation, preserving edge effects, where appropriate.

Mitigation Measure

BIO-7: **Conceptual Mitigation Plan for Sensitive Habitat.** To compensate for the loss of the non-native grassland buffer, and to minimize degradation of sensitive habitats during trail operation, the City will retain a qualified biologist to develop a Conceptual Habitat Mitigation Plan (CMP). The details of the CMP will be developed in consultation with CDFW, Watsonville Wetlands Watch and, if determined to be appropriate and beneficial, the Land Trust of Santa Cruz County. The CMP will include the following components.

a. Strategies to protect sensitive habitat from degradation associated with trail operation and to enhance core areas to improve habitat values.

b. Monitoring of sensitive habitat (at a frequency to be determined in consultation with the agencies) by a qualified biologist to ensure degradation is not occurring and invasive weeds are eradicated to prevent further encroachment into sensitive habitat areas. Adaptive management strategies to modify and/or supplement existing mitigation measures, in the event that the monitoring biologist identifies degradation of sensitive habitat

c. Communication protocol for local law enforcement and public works representatives to immediately alert Watsonville Wetlands Watch, CDFW Reserve Representatives, and/or the assigned monitoring biologist in the event that illegal encampments or other degradation of sensitive habitats are observed.

For efficiency, this CMP for sensitive habitat protection could be integrated with the CMP developed to mitigate impacts to CRLF habitat and displaced wetlands (described in Mitigation Measures BIO-2 and BIO-10, respectively), such as the creation or enhancement of sensitive habitats within the CDFW Reserve or on Watsonville Slough Farm.

3. *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?*	☐	☒	☐	☐

Discussion: The information in this section is based on the jurisdictional aquatic resources delineation report prepared for this project by EcoSystems West (EcoSystems West 2020b) (**Attachment E**). This report has been reviewed and accepted by the Planning Department Environmental Section.

Proposed trail construction would result in temporary and permanent impacts to wetlands, other waters, and associated habitats, including impacts to arroyo willow riparian (a sensitive habitat discussed under Impact BIO-2), palustrine emergent wetland, and aquatic (Struve Slough and Watsonville Slough). A jurisdictional aquatic resources delineation report was prepared for the Project Area (EcoSystems West 2020b).

Work within wetlands and other waters is subject to regulation by the USACE under Section 404 of the CWA, by the RWQCB under Section 401 of the CWA, and by CDFW under Section 1600. It is anticipated that the proposed project would require permits and approvals from these agencies.

Wetlands are granted protections under the County's Sensitive Habitat Protection and Riparian Corridor and Wetlands Protection ordinances (SCCC 16.30 and 16.32). In order to conduct work within 100 feet of a wetland, the project must be granted a riparian exception. Based on the following criteria, the Project meets the preliminary requirements for approval of a Riparian Exception by the County.

- *There are special circumstances or conditions affecting the property.* Due to changes in hydrology and geomorphology, the existing section of Lee Road that crosses Struve Slough has been submerged, making this long-standing roadway impassable. The Lee Road Trail would re-establish this transportation corridor and connection for bicycles and pedestrians along Lee Road.

  Furthermore, the Lee Road Trail would provide a scenic nature trail access for community members and for students between Pajaro Valley High School and the surrounding residential communities, as well as a safe route to school. The proposed trail provides the safest and most scenic access available. Although the proposed alignment would displace a small portion of a ruderal seasonal wetland, the trail is proposed to be located on the edge of the Reserve where impacts to biological resources, including wetlands, CRLF, and wildlife movement would be minimized. A replacement mitigation wetland would provide vastly improved wildlife habitat and wetland functions and values relative to the existing seasonal wetland, which is dominated entirely by facultative (FAC) invasive weeds. The proposed trail would not displace valuable (prime) agricultural land.

- *The exception is necessary for the proper design and function of the Lee Road Trail.*

  As stated above, Lee Road is an established public right of way that has become impassable due to hydrologic and geomorphologic changes. The proposed project would reestablish the proper design and function of the right of way for bicycle and pedestrian travel.

  Furthermore, the Lee Road Trail is a scenic nature trail, which is an allowed activity. Moving the trail further east into the Reserve would not eliminate impacts to the seasonal wetland and may result in increased permanent impacts to sensitive resources and habitat fragmentation.

- *The granting of the riparian exception will not be detrimental to the public welfare or injurious to other property downstream or in the area in which the project is located.* The Lee Road Trail would be an asset to public welfare in that it is providing safe access for residents and for Pajaro Valley High School students along a scenic nature trail. The proposed trail location is positioned as far from the slough (and its resources) as possible, along the westernmost edge of the CDFW Reserve, and the general topography near the trail slopes away from Struve Slough, thus minimizing impacts to riparian vegetation and the slough.

The bridge is proposed to be constructed on top of the existing submerged Lee Road. Approximately 50 percent of the existing roadway would be removed for the project, which is expected to improve habitat quality and remove non-native asphalt and other materials from the slough. The granting of the riparian exception in the Coastal Zone would not reduce or adversely impact the riparian corridor; minimal permanent impacts (0.017 acres) to the riparian corridor are anticipated as a result of the proposed Project; and there is no feasible less environmentally damaging alternative to crossing the slough.

The replacement/mitigation wetland(s) would provide improved wildlife habitat and wetland functions and values and would offset these losses. In general, the Conceptual Mitigation Plan (CMP) that will describe mitigation for the proposed trail would enhance habitat conditions within the Reserve.

- *The granting of the exception, in the Coastal Zone, will not reduce or adversely impact the riparian corridor, and there is no feasible less environmentally damaging alternative.* A total of 0.017 acres of permanent impacts to the riparian corridor (arroyo willow riparian) are anticipated as a result of the proposed project. This impact is required to facilitate the landing of the pedestrian bridge south of Struve Slough. This impact is unavoidable, and there is no feasible less environmentally damaging alternative design for the bridge. The remainder of proposed trail would be positioned along the outside edge of the CDFW Reserve with the minimum number of necessary bridge supports within the Struve Slough, thereby avoiding impacts to riparian vegetation and minimizing impacts to West Branch Struve Slough and Struve Slough.
- *The granting of the riparian exception is in accordance with the purpose of [Chapter 16.30 Riparian Corridor and Wetlands Protection][6], the objectives of the General Plan and elements thereof, and the Local Coastal Program Land Use Plan.* As stated above, Lee Road is an established roadway that has become impassable due to hydrologic and geomorphologic changes. The proposed project would reestablish the proper design and function of the right of way for bicycle and pedestrian travel. Through the proposed placement and careful design of the trail, impacts to the riparian corridor would be minimized and the trail is in accordance with protections, values, and goals of the ordinance. The trail satisfies the directives of the County of Santa Cruz General

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[6] The purpose of this chapter is to minimize and to eliminate any development activities in the riparian corridor, preserve, protect, and restore riparian corridors for: protection of wildlife habitat; protection of water quality; protection of aquatic habitat; protection of open space, cultural, historical, archaeological and paleontological, and aesthetic values; transportation and storage of floodwaters; prevention of erosion; and to implement the policies of the General Plan and the Local Coastal Program Land Use Plan. [Ord. 3335 § 1, 1982; Ord. 2460, 1977].

Plan and the LCP by providing direct scenic access to the CDFW Reserve and educational opportunities for the community. It is also consistent with the City of Watsonville's Trail and Bicycle Master Plan for the Watsonville Scenic Trails Networks (November 2012).

Impacts

Impact BIO-3: The project would adversely affect wetlands, aquatic habitat and associated riparian habitat.

Seasonal Wetland. One small (0.07 acres), ruderal palustrine emergent wetland, located near the gated entrance to the CDFW Reserve near the Harkins Slough Road/Lee Road intersection, would be impacted by the proposed trail. This marginal wetland is dominated entirely by facultative (FAC) annual invasive weeds, and hydrologic indicators limited largely to surface soil cracks demonstrate this wetland is saturated for very short durations during the rainy season. Moreover, the landscape position and microtopography of the wetland does not provide significant benefits (i.e. ecosystem services) to the larger Watsonville Sloughs system in terms of water quality, sediment sequestration, and nutrient cycling. The homogeneous vegetation and lack of open water provide limited habitat to value to wildlife within the Reserve.

The project would result in 0.005 acres (220 square feet) of permanent impacts to this feature and 0.009 acres (440 square feet) of temporary impacts. The seasonal wetland would be partially displaced by construction of the proposed trail, through equipment access, grubbing, vegetation removal, grading, and trail construction. Impacts to this feature would be minimized to the extent feasible and permanent loss would be mitigated through replacement and/or enhancement. Mitigation opportunities identified by Watsonville Wetlands Watch indicate creation of new wetland features elsewhere within the CDFW Reserve or nearby Watsonville Sloughs system would result in net ecological benefits for water quality, habitat connectivity, nutrient cycling, sediment sequestration, and wildlife habitat (as indicated in Appendix H of the Biotic Report in **Attachment D**). The permanent loss of a seasonal wetland requires replacement and/or enhancement to reduce this impact to a less than significant level.

Seep. One small 0.010-acre (440 square feet) wetland seep is situated along the steep, eastern embankment of Lee Road immediately north of the area where the road becomes submerged beneath Struve Slough. This feature is dominated entirely by facultative (FAC) plants and the landscape position and direct indicators of wetland hydrology indicate the seep wetland is only saturated near the ground surface for short durations during the rainy season. The seep appears to be the result of flowing surface and subsurface water abruptly intercepting the steep, unnatural escarpment/road cut along the east side of the Lee Road. This feature does not contain standing water or vegetative structural heterogeneity and therefore provides limited benefit to wildlife.

The proposed project would likely displace or result in permanent impacts to the entire 0.010 acres (440 square feet) of this feature for the Struve Slough Bridge approach In addition, the seep wetland could be impacted by construction of a stormwater management "bioswale" upslope and east of the seep. Capture of surface water flows by the swale are necessary for safety and function of the trail and may directly impact the hydrology of the seep. It is possible that this feature would no longer maintain wetland hydrology due to this modification. As currently designed the bioswale would terminate in a vegetated basin (seasonal wetland) and rock-lined outfall structure that would offset the loss of this feature in part. Onsite mitigation opportunities would be included in the functional design of the proposed bioswale, or would be included in the design and planned functions and values of the proposed mitigation wetlands, as outlined in Appendix H of the Biotic Resources report **(Attachment D)** to be considered a less than significant impact.

Freshwater Marsh. Freshwater marsh occurs at the margins of Struve Slough and along the channelized stretch of Watsonville Slough. The project would result in 0.017 acres (740 square feet) of permanent impacts and 0.121 acres (5,300 square feet) of temporary impacts to this habitat types. Permanent impacts and temporary disturbance to these habitat types would occur during construction of the Struve Slough Bridge and during replacement of the Watsonville Slough culvert under Lee Road. For Struve Slough bridge construction, activities such staging, equipment access, construction of temporary access roads, construction of bridge abutments and construction of the bridge approaches may result in temporary disturbances freshwater marsh. For the culvert replacement, some marsh vegetation would be displaced to allow for installation of the longer culvert. During construction some additional vegetation may need to be removed in order to access the construction footprint. These temporary impacts would be mitigated by replacing the vegetation through natural recruitment (which would occur if roots remain and near freshwater marsh) or, where necessary, replacement planting. Permanent displacement would be mitigated through replacement or enhancement.

Aquatic Habitat. Permanent impacts of 0.003 acres (130 square feet) to the aquatic habitat of Struve Slough would result from displacement of this habitat by the piers to support Struve Slough Bridge. Temporary impacts of 0.497 acres (22,000 square feet) would result from construction, including equipment access, construction of temporary access roads, installation of coffer damns, construction of bridge piers and construction of the bridge. Impacts may occur from the introduction of sediment or construction materials, potential unanticipated releases of equipment fuel, hydraulic fluid, or other potentially hazardous substances used in construction equipment. No permanent impacts to Watsonville Slough are anticipated as a result of the culvert replacement, but temporary impacts may result from construction including introduction of sediments or other construction-related materials. Temporary impacts would be less than significant with implementation of the BMPs included in the project description.

The impacts to wetlands, aquatic habitat and associated riparian habitat would be minimized by implementing the mitigation measures identified below and the BMPs described in the project description for air quality, biological resources, and erosion control and water. Therefore, the impact would be **Less than Significant with Mitigation**.

Mitigation Measure

BIO-8: **Wetlands Protection Measures during Construction.** The City, in coordination with the construction contractor and qualified biologist, will implement the following wetlands protection measures during construction near Struve Slough.

a. Avoid or minimize disturbance to palustrine emergent wetlands (seasonal wetland, seep, and freshwater marsh), and aquatic habitats by having a qualified biologist identify fencing limits for the work, staging, and access areas; and restrict all activity to within this footprint.
b. Where feasible, avoid grubbing and construction within 100 feet of the edge of wetlands and other waters per the County's Sensitive Habitat Protection and Riparian Corridor and Wetlands Protection ordinances (SCCC 16.30 and 16.32). Restrict access roads into Struve Slough and minimize access roads to the greatest extent feasible.

Mitigation Measure

BIO-9: **Wetland Replacement.** The City in coordination with a qualified biologist will replace and/or enhance displaced wetlands (seasonal wetland and freshwater marsh) at a ratio to be determined in consultation with regulatory agencies. Typical mitigation ratios vary between 2:1 and 4:1 depending on the quality of the displaced habitat. The size and location of the wetland would be developed in the Conceptual Mitigation Plan (refer to Mitigation Measure BIO-10). On site mitigation (i.e., within the CDFW Reserve and along channelized Watsonville Slough) would be the preferred location for the mitigation wetland(s). The Land Trust of Santa Cruz County also proposed Watsonville Slough Farm (located adjacent to the CDFW Reserve on the west side of Lee Road) as an alternate wetland mitigation site. A memo developed by Watsonville Wetlands Watch, identifying potential mitigation sites is included in Appendix H of the biotic report (**Attachment D**). This memo outlines several viable areas for wetland creation and enhancement, including with the CDFW Reserve. Site reconnaissance and advanced planning for these locations indicate these area would meet the objectives for long-term benefits to wetland resources and wildlife within the Watsonville Sloughs system.

Mitigation Measure

BIO-10: **Conceptual Mitigation Plan for Wetlands Habitat.** The City will retain a qualified biologist to develop a conceptual mitigation plan (CMP) for wetlands habitat. The details of the CMP will be developed in consultation with USFWS, CDFW, Regional Water Quality Control Board, and Watsonville Wetlands Watch and include the following components.

a. Description of the Lee Road Trail Project including acreage of temporary and permanent impacts to palustrine emergent wetland, arroyo willow riparian, freshwater marsh, and aquatic habitat (Struve Slough and Watsonville Slough), as identified in the formal delineation of jurisdictional wetlands and other Waters of the U.S.

b. Goals of compensatory mitigation project including types and areas of wetland and aquatic habitat to be created, restored, and/or enhanced, and mitigation ratios (created/restored/enhanced : impacted).

c. Location and acreage of wetland and riparian mitigation areas including size and ownership status (refer to Appendix H of the biotic report) (**Attachment D**).

d. Detailed construction and planting techniques.

e. Replacement in kind of fresh water marsh vegetation that is temporarily or permanently lost. Replacement vegetation for temporary loss will occur by natural recruitment (which occurs if roots remain near freshwater marsh) or, where necessary, by replacement planting. Replacement vegetation for permanent loss will occur through replacement or enhancement.

f. Replacement of all non-native tree and shrub vegetation with native, locally-sourced vegetation. The non-native tree to be removed for trail construction (at southern Struve Slough Bridge approach) will be replaced with native trees. Any permanent disturbance to coastal scrub or riparian habitat will be mitigated through in kind replacement and/or enhancement.

g. Description and design of habitat requirements for special-status wildlife, including CRLF, occupying wetland and aquatic habitats.

h. Maintenance activities during the monitoring period, including replanting native wetland and riparian vegetation and weed removal, that will not result in take of CRLF.

i. Strategies for protecting the habitat values of the CDFW Reserve, Struve Slough, and Watsonville Slough, including wildlife movement.

j. Long-term quantitative and qualitative monitoring and reporting, documenting ability to meet or surpass performance criteria.

k. Adaptive management strategies to ensure long-term viability of mitigation areas.

For efficiency, this CMP for displaced wetlands could be integrated with the CMP developed to mitigate impacts to CRLF and sensitive habitats (described in Mitigation Measures BIO-2 and BIO-7, respectively).

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐

Discussion: Wildlife that are moving through the Study Area and surroundings are likely to use the sloughs and their riparian habitat as linear corridors because of the shelter, cover, food and water resources these areas provide. However, some species are likely to cross the section of Lee Road northwest of Struve Slough, to move between the CDFW Reserve, Chivos Pond and Hanson's Slough (on Watsonville Slough Farm property). Lee Road would be considered an existing barrier to wildlife movement; however, this section of Lee Road dead ends at Struve Slough, and traffic is currently primarily limited to vehicles accessing Watsonville Slough Farm and Fitz Fresh Mushrooms Farm, and mostly during daytime hours. Therefore, Lee Road is somewhat permeable to wildlife movement as are the surrounding agricultural fields. Potential impacts to wildlife movement associated with the proposed Lee Road Trail Project are described below.

Impact BIO-4: The project could interfere with wildlife movement, temporarily during construction and permanently during operation of the trail.

Construction

In the Lee Road North section of the trail (by the CDFW Reserve), construction of the proposed trail may deter wildlife from moving through the project area; however, wildlife movement across Lee Road is more likely to occur during nighttime hours. Construction-related deterrents to movement would be temporary, would occur during the dry season when CRLF movement would be minimal, and would occur only during daylight hours, minimizing this potential impact. Additionally, the construction BMPS include construction fencing with openings every 50 feet that would allow passage of wildlife. These factors minimize this potential impact to less than significant.

Operation

Operation of the trail would result in increased pedestrian and bicycle use and vehicle traffic in the area, and the trail maintenance activities would include weeding, mowing, pruning, and trail repair – all of which could deter wildlife movement. Once the Lee Road Trail is fully built-out (i.e., all five sections are constructed and open for use) and connected to the larger planned trail systems (LTSCC Watsonville Slough Farm, City Trail & Bicycle Master Plan, and Monterey Bay Sanctuary Scenic Trail system), it is estimated there could be up to 225 daily users throughout the week. Initially, the number of daily users is anticipated to be much lower, and additional vehicle traffic would be minimal.

Several factors minimize the potential for interference with wildlife movement. The project would restrict trail use to daylight hours (from dawn to dusk) and restrict parking along Lee Road (either prohibit parking or limit to daytime hours with signage), which would reduce traffic and potential interference with wildlife movement in the evening. Once the Watsonville Slough Farms trail system is open on the west side of Lee Road, it will include an off-street parking area; and both the trails and parking area would be only open during daylight hours (from dawn to dusk). The project also includes the installation of wildlife-friendly fencing on the east side of the trail along the CDFW Reserve that would allow wildlife to move across the trail. California blackberry, wild rose (*Rosa californica*), and other native plants that provide cover and shelter for wildlife and deter trespassing would be planted along the fence line. These factors minimize this potential impact to less than significant. Further,

Therefore, the construction-related and operation impacts to wildlife movement would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
5. *Conflict with any local policies or ordinances protecting biological resources (such as the Sensitive Habitat Ordinance, Riparian and Wetland Protection Ordinance, and the Significant Tree Protection Ordinance)?*	☐	☒	☐	☐

Discussion: The County of Santa Cruz Sensitive Habitat Ordinance requires that any unavoidable environmental impacts to sensitive habitats be mitigated. In addition, the ordinance calls for the protection of sensitive habitats “undisturbed by the proposed development activity” or on an adjacent parcel through measures such as conservation easements. Additionally, restoration “commensurate with the scale of the proposed development” is required for degradation of sensitive habitats caused by the project. Impacts to and proposed mitigation for sensitive habitats, including wetlands and aquatic habitat are described under #2 and #3 above, respectively.

The project would require approval of a Riparian Exception in order to be consistent with the County of Santa Cruz Riparian Corridor and Wetlands Protection Ordinance, as described under #3 above. Preliminary analysis has determined that the project complies with these findings. The project is therefore consistent with the County of Santa Cruz Riparian Corridor and Wetlands Protection Ordinance, and impacts from project implementation would be **Less than Significant with Mitigation**. Refer to the discussion under D-3.

One significant tree is proposed to be removed for the Lee Road Trail Project. One large (72-inch DBH) eucalyptus tree is proposed for removal to allow installation of the proposed southern Struve Slough Bridge approach. This tree is located within the jurisdiction of the County of Santa Cruz and Coastal Zone and would therefore be subject to the Significant Tree Protection Ordinance. Preliminary analysis has determined that removal of this tree would comply with the Significant Tree Protection Ordinance through issuance of a Coastal Development Permit (CDP) and through the following sections of the from SCCC 16.34:

(B) Removal is necessary to protect health, safety, and welfare. In order to provide a safe feasible approach for the Struve Slough Bridge this tree would need to be removed. Construction of the bridge approach would require removal as would safe operation of the trail.

(C) Removal of a nonnative tree is part of a plan approved by the County to restore native vegetation and landscaping to an area. The non-native eucalyptus tree would be replaced with native vegetation suitable to the location adjacent to the slough, as described in the mitigation below.

(D) Removal will not involve a risk of adverse environmental impacts such as degrading scenic resources. The removal of the eucalyptus tree would not result in adverse environmental effects. The non-native tree would be replaced with native vegetation more suitable to, and scenic in, the natural landscape, as described in the mitigation below.

(F) Removal is necessary in conjunction with another permit to allow the property owner an economic use of the property consistent with the land use designation of the Local Coastal Program Land Use Plan. This project would create a scenic nature study trail and is therefore consistent with the County Local Coastal Program and land use designations in its mandate to allow for public access to coastal resources.

IMPACT BIO-5: One significant tree would be removed to allow for construction (and operation) of the southern Struve Slough Bridge approach.

Planting replacement trees and native vegetation would reduce this impact to a less than significant level. Therefore, this impact is **Less than Significant with Mitigation**.

Mitigation Measure

BIO-11: **Plant Replacement Tree(s) and Native Vegetation for Significant Tree Removal**. The City will ensure the following measures are implemented.

a. The southern Struve Slough Bridge approach will be revegetated with native vegetation suitable to the location such as: blue elderberry (*Sambucus nigrum*), coffeeberry (*Frangula californica*), Indianhemp dogbane (*Apocynum cannabinum*), California blackberry (*Rubus ursinus)*, and wild rose (*Rosa californica)*. Although these species are not tree species, this palette is more suitable than trees to the natural landscape in this location.

b. To fulfill the condition of approval to replace Significant Trees within the County Coastal Zone, and to mitigate for impacts elsewhere along the trail, Native tree(s) will be planted as a component of Mitigation BIO-7: Conceptual Mitigation Plan for Sensitive Habitat (#2 above). The mitigation location for tree replacement and selection of tree species will be determined by a qualified biologist in conjunction with the County, CDFW, and Watsonville Wetlands Watch. Native tree(s) suitable to the proposed mitigation location for mitigation and the planting plan will be approved at replacement ratio determined by the County prior to implementation.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion: The project would not conflict with the provisions of any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, **No Impact** would occur.

E. CULTURAL RESOURCES

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?	☐	☒	☐	☐

Discussion: The information in this section is based on the Phase 1 Archaeological Investigations for the Lee Road Trail Project prepared by Albion (Albion September 2020) and approved by the County (**Attachment I**). Based on the records search conducted at the Northwest Information Center, there are three cultural resources that overlap with the project area: the Costanoan-Ohlone Cemetery Site, Santa Cruz Branch Rail Line, and Highway 1.

Background historical research revealed that the project area was once part of two Mexican Period ranchos, but no structures or other cultural landscape features from these ranchos appear to be in the project area. Historic maps show that by the late 19th century, the project area was the location of a series of agricultural properties, with the Santa Cruz Branch Rail Line crossing the southern-most portion of the project area by 1876. By the early 20th century, Lee Road and Harkins Slough Road were both present, bordered by a small number of adjacent farms. By the 1960s, these farms were accompanied by industrial warehouses in the southern portion of the project area. There are no existing structures in the project area designated as a historic resource on any federal, state or local inventory.

Impacts

Given its age, the "Santa Cruz Branch Rail Line" of the former Southern Pacific Railroad is potentially eligible under CEQA. However, there would be no ground disturbing project activities within the railroad right of way, and the project would have no potential adverse effects on this resource. Therefore, the impact to this resource would be less than significant with no mitigation required.

"Highway 1" is located approximately 400 feet east of the proposed trail alignment along Lee Road at its closest point, and the Watsonville Slough section extends beneath the Highway 1 overpass (**Figure 2**). In this part of the County, the highway comprises a modern freeway that has entirely replaced the historic highway. Albion's field survey identified no elements of Highway 1 that could be older than 50 years or otherwise constitute historic remnants of old Route 56 that preceded it. Therefore, there are no cultural resources associated with this recorded site that could be affected by the project. The impact to this resource would be less than significant with no mitigation required.

The "Costanoan-Ohlone Cemetery Site", listed on the National Register since 1976, was heavily disturbed in the 1970s during initial construction of the industrial warehouse complex that exists in this location today. Mechanical grading at the time disturbed much of the archaeological midden material and many of the burials. Salvage archaeology during construction managed to recover remains of dozens of human burials and associated artifacts. However, despite these major disturbances to the site, there is the potential for intact archaeological deposits and additional ancestral human remains within the project area. Based on this information, Albion concludes that the Costanoan-Ohlone Cemetery Site qualifies as a historical resource under CEQA and as a historic property under the National Historic Preservation Act, and that ground disturbing activities associated with the project have the potential to result in significant impacts to this resource.

In addition, given the presence of multiple known pre-contact and historic period sites in and within a half-mile of the APE, there is a possibility that additional buried sites exist that are not visible on the surface or on available historic imager, and therefore not identified during field studies.

Recommendations made by Albion in their Phase I Archaeological Investigations and by Tribal representatives during Tribal outreach efforts (described in Section R, Tribal Cultural Resources) have been incorporated into the required mitigation below and the County's Conditions of Approval for all phases of development for the proposed project, as applicable. Therefore, the impact would be **Less than Significant with Mitigation**.

Mitigation Measure

CR-1: **Conditions of Approval to Minimize Impacts to Cultural Resources and Tribal Cultural Resources.** Prior to and during construction, the City of Watsonville will implement the following measures.

a. Prior to any site disturbance, a pre-construction meeting shall be conducted. The purpose of the meeting will be to ensure that the conditions set forth in the proposed project description and permit requirements are communicated to the various parties responsible for constructing the project. The meeting shall involve all relevant parties including the project proponent, construction supervisor, the project Archaeologist, and the Native American Monitor.

b. A California trained Archaeologist and qualified trained Native American Monitor shall be on site during all ground-disturbing activities in the vicinity of CA-SCR-107 and any other areas where monitoring is determined necessary through Native American Consultation and pre-construction testing. Both monitors shall have the authority to stop construction to implement the Archaeological Treatment Plan if necessary.

c. A Construction Monitoring Plan for Cultural Resources and Human Remains shall be prepared by a qualified Archaeologist. This formal monitoring plan shall be intended to provide a detailed outline for targeted archaeological monitoring of construction in the project area. The monitoring plan shall be a standalone document prepared in conjunction with the Archaeological Treatment Plan.

d. In consultation with Native American Tribes and the County, an Archaeological Treatment Plan shall be prepared by a qualified archaeologist for implementation during all ground disturbance associated with the project (including archaeological testing activities). The Archaeological Treatment Plan shall outline the treatment of archaeological resources encountered during ground disturbance and shall include the following at minimum:

- Background information that summarizes the sensitivity of the project area for Archaeological resources and significant Native American Cultural Sites.
- Description of the specific locations and methods of pre-construction archaeological testing activities for the two different construction phases as outlined below.
    - Testing shall be undertaken to the maximum depth of planned project impacts With a Native American monitor present at all times.
    - The goal of this testing shall be to determine if intact archaeological deposits or ancestral human remains survive in these locations, assess the nature of these deposits, and recommend any additional protective measures to be implemented.
    - Archaeological testing for Phase 1 on the north side of Struve Slough shall be comprised of clearing/mowing of vegetation along the trail alignment, additional surface surveys to identify any necessary testing locations, and excavation of a series of shovel probes to be determined in coordination with a Native American representative.
    - Archaeological testing for Phase 2 on the south side of Struve Slough shall be undertaken on both sides of Lee Road, using hand and/or mechanical excavation methods, in locations determined in coordination with a Native American representative. Specific care and instructions should be directed to where the previously recorded Costanoan-Ohlone Cemetery Site (CA-SCR-107) intersects with proposed ground disturbing project activities.
- Avoidance and preservation in place is the preferred method of treatment. Archaeological resources shall be avoided and preserved in place as much as feasible. Reasonable efforts shall be made to preserve archaeological resources in place or leave in an undisturbed state.
- Describe the methods for identification, evaluation, and treatment of any discoveries (e.g., leave in place and cap based on Native American recommendations).
- Outline the notification procedures given in SCCC Chapter 16.40 for discovery of archaeological resources and human remains.
- If disturbance is unavoidable, the preferred method of treatment would be to record any data necessary to adequately document the scientifically consequential information from and about the disturbed historical resource, and then return all artifacts as close to their original location as possible before capping or covering with soil.

e. All construction personnel working on the project shall receive cultural sensitivity training conducted by a California trained Archaeological monitor and qualified trained Native American Monitor. Cultural sensitivity training shall occur before a person is authorized to work at the project site.

f. Pursuant to section 16.40.040 of the SCCC, if archaeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the following notification procedures given in SCCC Chapter 16.40.

- Pursuant to section 16.40.040 of the SCCC, and California Health and Safety Code sections 7050.5-7054, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible persons will immediately cease and desist from all further site excavation and notify the Sheriff-Coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archaeological report will be prepared, and representatives of local Native American Indian groups shall be contacted. If it is determined that the remains are Native American, the Native American Heritage Commission will be notified as required by law. The Commission will designate a Most Likely Descendant who will be authorized to provide recommendations for management of the Native American human remains. Pursuant to Public Resources Code section 5097, the descendants will complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. Disturbance will not resume until the significance of the resource is determined and appropriate mitigations to preserve the resource on the site are established.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. *Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?*	☐	☒	☐	☐

***Discussion*:** According to the Archaeological Investigation Report prepared by Albion (2020), there is potential for the project to cause an adverse change in the significance of an archaeological resource associated with the recorded the Costanoan-Ohlone Cemetery Site. Refer to the discussion under E-1. This impact would be **Less than Significant with Mitigation**.

Mitigation Measure

CR-1: Conditions of Approval to Minimize Impacts to Cultural Resources and Tribal Cultural Resources.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

Discussion: According to the Archaeological Investigation Report prepared by Albion (2020), there is potential for the project to disturb human remains associated with the recorded the Costanoan-Ohlone Cemetery Site. Refer to the discussion under E-1. This impact would be **Less than Significant with Mitigation**.

Mitigation Measure

CR-1: Conditions of Approval to Minimize Impacts to Cultural Resources and Tribal Cultural Resources.

F. ENERGY

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐

Discussion: The project, like all development, would be responsible for an incremental increase in the consumption of energy resources during construction due to onsite use of construction equipment and vehicle and truck trips. All project construction equipment would be required to comply with the CARB emissions requirements for construction equipment, which includes measures to reduce fuel-consumption, such as imposing limits on idling and requiring older engines and equipment to be retired, replaced, or repowered. In addition, the project would comply with Santa Cruz General Plan policy 8.2.2, which requires all new development to be sited and designed to minimize site disturbance and grading. The trail would be designed to be ADA compliant, which minimizes the trail slope and necessary grading. As a result, impacts associated with the small temporary increase in consumption of fuel during construction are expected to be less than significant.

The project would involve minimal new security lighting and would not result in a net increase in VMT. Nominal impacts are expected from project implementation. Therefore, the project would not result in wasteful, inefficient, or unnecessary consumption of energy resources. The impacts would be **Less than Significant**. No mitigation would be required.

2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Discussion: AMBAG's 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) recommends policies that achieve statewide goals established by CARB, the California Transportation Plan 2040, and other transportation-related policies and state senate bills. The SCS element of the MTP targets transportation-related greenhouse gas (GHG) emissions in particular, which can also serve to address energy use by coordinating land use and transportation planning decisions to create a more energy efficient transportation system.

The Santa Cruz County Regional Transportation Commission (SCCRTC) prepares a County-specific regional transportation plan (RTP) in conformance with the latest AMBAG MTP/SCS. The 2040 RTP establishes targets to implement statewide policies at the local level, such as reducing vehicle miles traveled and improving speed consistency to reduce fuel consumption.

In 2013, Santa Cruz County adopted a Climate Action Strategy (CAS) focused on reducing the emission of greenhouse gases, which is dependent on increasing energy efficiency and the use of renewable energy. The strategy intends to reduce energy consumption and greenhouse gas emissions by implementing a number of measures such as reducing vehicle miles traveled through County and regional long-range planning efforts, increasing energy efficiency in new and existing buildings and facilities, increasing local renewable energy generation, improving the Green Building Program by exceeding minimum state standards, reducing energy use for water supply through water conservation strategies, and providing infrastructure to support zero and low emission vehicles that reduce gasoline and diesel consumption, such as plug in electric and hybrid plug in vehicles that reduce.

In addition, the Santa Cruz County General Plan has historically placed a priority on "smart growth" by focusing growth in the urban areas through the creation and maintenance of an urban services line. Objective 2.1 directs most residential development to the urban areas, limits growth, supports compact development, and helps reduce sprawl. The Circulation Element of the General Plan further establishes a more efficient transportation system through goals that promote the wise use of energy resources, reducing vehicle miles traveled, and transit and active transportation options.

Energy efficiency is also a major priority throughout the County's General Plan. Measure C was adopted by the voters of Santa Cruz County in 1990 and explicitly established energy conservation as one of the County's objectives. The initiative was implemented by Objective 5.17 and includes policies that support energy efficiency, conservation, and encourage the development of renewable energy resources. Also, Goal 6 of the Housing Element promotes energy efficient building code standards for residential structures constructed in the County.

In 2015, Watsonville adopted a Climate Action Plan (CAP) to assist Watsonville in preparing for the potential impacts of climate change and protect public health, safety and critical infrastructure. The CAP identifies and prioritizes policies and programs that both reduce GHG emissions and increase the ability of the city to adapt to future climate impacts. Based on state guidance, the CAP establishes the goals of reducing GHG emissions by 15 percent from 2005 levels to meet the AB 32 target and 25 percent below 2005 emissions by 2030 to continue on the trajectory to reach the 2050 reduction target. The CAP includes a list of actions for the City to implement to reduce GHG emissions, including improvements for bicycle and pedestrian infrastructure and incentive programs to promote reduction in vehicles miles travelled and utility use. The CAP does not include specific requirements or emissions reduction targets for individual projects.

The project proposes an alternative transportation facility that would support a regional reduction in VMT. The project would be consistent with the AMBAG 2040 MTP/SCS and the SCCRTC 2040 RTP. The project would also be required to comply with the Santa Cruz County General Plan and any implemented policies and programs established through the CAS or CAP. Therefore, the project would not conflict with or obstruct any state or local plan for renewable energy or energy efficiency. The impact would be **Less than Significant**. No mitigation would be required.

G. GEOLOGY AND SOILS

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
A. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
B. Strong seismic ground shaking?	☐	☐	☒	☐
C. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
D. Landslides?	☐	☐	☒	☐

***Discussion (A through D)*:** All of Santa Cruz County is subject to some hazard from earthquakes, and there are several faults within the County. While the San Andreas fault is larger and considered more active, each fault is capable of generating moderate to severe ground shaking from a major earthquake. Consequently, large earthquakes can be expected in the future. The October 17, 1989 Loma Prieta earthquake (magnitude 7.1) was the second largest earthquake in central California history, and resulted in substantial earth movement throughout the Watsonville area.

Alquist-Priolo Earthquake Fault Zone. The project area is located outside of the limits of the State Alquist-Priolo Special Studies Zone or any County-mapped fault zone (County of Santa Cruz 2020a; California Division of Mines and Geology 2001). The project area is located approximately 6 mile(s) west of the San Andreas fault zone, and approximately 3 mile(s) west of the Zayante-Vergeles fault zone. In addition to these major fault zones, the Sargent, Berrocal and Monterey Bay-Tularcitos Faults are located approximately 9, 10, and 12 miles from the project area, respectively. A Geotechnical Investigation for the proposed project was performed by Pacific Crest Engineering in December 2019 and updated in September 2020 (**Attachment F**). The report concluded that due to the proximity of the project area to active and potentially active faults that it is reasonable to assume that the project area would experience high intensity ground shaking during the lifetime of the project.

Soil Types. The project area transects two distinctive geologic units. The portion of the project area north of Struve Slough is mapped on the USGS Geologic Map of Santa Cruz County (Brabb 1997) as terrace deposits. The remaining portion of the project area (including Struve Slough) is mapped as being underlain by basin deposits.

The terrace deposits are described as weakly consolidated to semi-consolidated deposits of moderately to poorly-sorted silt, silty clay, sand, and gravel. Basin deposits typically consist of unconsolidated, plastic clay and silty clay that is rich in organic materials, and can locally contain thin interbedded layers of silt and silty sand. Basin deposits are generally found in environments that support hydrologic systems, consistent with the characteristics of the project area.

Potential Both the terrace and basin deposits are geologic units that are sensitive to impacts from the natural environment; therefore, the proposed project elements (pedestrian/bicycle trail and bridge, sidewalks, and culvert/storm drain replacement) are subject to intense impacts from changes in the natural environment, including seismic-related ground failure, liquefaction, lateral spreading, and landslides.

Liquefaction Potential. Based on a review of the Santa Cruz County GIS Hazard Map, the project area is mapped with a very high susceptibility for liquefaction. This was verified with the geotechnical analyses that were undertaken for the project that found that both the terrace and basin deposits that underlay the project area are fairly unconsolidated, meaning that when inundated with water the soils don't hold together and become liquid in nature, rather than draining liquids from the surface. Liquefaction induced lateral spreading occurs when a liquefied soil mass fails toward an open slope face or fails on an inclined topographic slope. Because the geographic analyses found a high potential for liquefaction throughout the project area, the potential for lateral spreading is also considered high. It is estimated that lateral spreading could occur on the order of 30 inches within the sloping areas of the trails underlain by the basin deposits within the northern project area west of the proposed bridge, and on a smaller scale throughout the remainder of the project area.

Shrink/Swell Potential. The project area has been mapped through the Santa Cruz County GIS Hazard Map as being underlain with expansive soils. The geotechnical analysis performed for the project supported these findings, with the entire project area being underlain by varying layers of moderate to highly expansive clay. Expansive soils tend to expand during the rainy season and contract during the dry season. Therefore, the project area is subject to shrink/swell potential, based on the moisture fluctuations of the seasons, particularly in those areas close to water bodies (Struve and Watsonville Sloughs).

Landslide Potential. The potential for landslides has also been mapped through the Santa Cruz County GIS Hazard Map. The entire project area, and surrounding lands, have been mapped as having no potential for landslides. This was confirmed through the geotechnical analysis undertaken for the project that found that the project area is situated in an area that is relatively flat in nature, supporting gently sloping topography. Risks associated with the project are limited to the potential for pathways with sloping areas to become undermined if surface runoff is not adequately controlled.

Based on the geologic risks that are present throughout the project area, there is potential for injury and loss of life from seismic shaking or seismic-induced ground failure. As stated in the project description, the project would be designed in accordance with the recommendations identified in the Geotechnical Investigation prepared for the project by Pacific Crest Engineering and approved by the County (**Attachment F**). There are recommendations for earthwork, pedestrian bridge foundations, retaining walls, pavement design, erosion control, and surface drainage. As described in the project description, under Design Engineering, the project elements (pedestrian/bicycle trail and bridge, sidewalks and bicycle lanes, retaining walls, culvert replacement and drainage improvements) would be designed in accordance with the recommendations included in the Geotechnical Investigation (Pacific Crest 2020, **Attachment F**), the Hydrologic and Hydraulic Analyses (Balance Hydrologics 2020a, **Attachment G**), and the Culvert Hydraulic Analysis (Balance Hydrologics 2020b, **Attachment H**) prepared for the project. Therefore, risks to loss, injury or life as a result of geologic hazards would be minimized. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

2. *Result in substantial soil erosion or the loss of topsoil?*	☐	☐	☒	☐

Discussion: The project area is relatively flat in nature, supporting gently rolling topography that is largely vegetated or flat areas that are developed and support local roadways.

Throughout project construction, there is some potential for erosion as the surface soils that are underlain by terrace and basin deposits are classified as having a moderate potential for erosion (Brabb 1997). However, this potential is minimal because the overall slope of the project area is largely flat in nature, and cut and fill methodologies are not required for implementation of the project. There are two locations where a retaining wall may be required, including the south side of Harkins Slough Rd to support widening for bike lane, and on the east side of Lee Road for the northern bridge approach.

Standard erosion controls are a required condition of the project that would include track rolling of the exposed slopes and the revegetation of all disturbed surfaces. Prior to approval of a grading or building permit, the project must have an approved stormwater pollution control plan (SCCC Section 7.79.100), which would specify detailed erosion and sedimentation control measures. The plan would include provisions for disturbed areas to be planted with native vegetation to establish a groundcover that would minimize surface erosion. Also refer to the Best Management Practices listed in the project description.

Therefore, the impacts from soil erosion or loss of topsoil would be **Less than Significant**. No mitigation would be required.

3. *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?*	☐	☐	☒	☐

Discussion: The project area does not include slopes that exceed 30%, and there are no areas that are in the vicinity of a coastal cliff or bluff that could contribute to coastal cliff erosion. However, as described under question G-1, the project area is located on terrace and basin deposits that are composed of soils underlain with clay materials that would be subject to landslides, lateral spreading, subsidence, liquefaction and potential collapse. Through implementation of the recommendations that have been included in the geotechnical analyses, the project would be designed and constructed under the parameters established by this study. Therefore, impacts that may be caused by the instability of the geologic units that underlay the project area would be minimized, and the project would remain stable over time. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

4. Be located on expansive soil, as defined in section 1803.5.3 of the California Building Code (2016), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐

Discussion: The project area has been mapped through the Santa Cruz County GIS Hazard Map as being underlain with expansive soils. As described under question G-1, the entire project area is underlain by varying layers of moderate to highly expansive clay as contained in the terrace and basin geologic units. Expansive soils tend to expand during the rainy season and contract during the dry season. Therefore, the project area is subject to shrink/swell potential, based on the moisture fluctuations of the seasons, particularly in those areas close to water bodies (Struve Slough and Watsonville Slough). Potential impacts would be minimized by designing the project in accordance with the recommendations identified in the geotechnical analysis. Therefore, impacts that may be caused by the expansive clay soils that underlay the project area would be minimized, and the project would remain stable over time. The impact would be **Less than Significant**. No mitigation would be required.

5. Have soils incapable of adequately supporting the use of septic tanks, leach fields, or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion: The project does not include the use of septic tanks, leach fields or any alternative waste water disposal systems. The project would also not require connection to the Santa Cruz County Sanitation District infrastructure, as there would be no waste water that would be generated as a result of project implementation. Therefore, there would be **No Impact** that would result through waste water disposal.

6. Directly or indirectly destroy a unique paleontological resource or site of unique geologic feature?	☐	☐	☒	☐

Discussion: Implementation of the project would involve ground disturbing activities through the construction of the trail alignments, Struve Slough Bridge, and the replacement of culverts, storm drains, and associated drainage infrastructure. Paleontological resources are located within geologic deposits or bedrock that underlay soil layers. Throughout Santa Cruz County, areas that are considered sensitive for paleontological resources have been mapped (Santa Cruz County GIS Mapping, 2016). To develop this map, a review of relevant scientific literature was undertaken, in addition to a review of local museum records. This information was then evaluated in conjunction with the local geography to identify valuable paleontological and geologic resources that are known to exist, or are likely to be present, throughout the County. Throughout this process, seven areas were identified as supporting, or being likely to support, rare or unique paleontological or geologic resources. These areas are all located within the northern portion of the County (Santa Cruz County GIS Mapping, 2016).

The project area is not located within an area that has been identified as supporting paleontological or geologic resources or characteristics in which paleontological or geologic resources may occur. Therefore, ground disturbing activities from project construction are not expected to disturb existing paleontological resources. The impact would be **Less than Significant**. No mitigation would be required.

H. GREENHOUSE GAS EMISSIONS

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

Discussion: The project, like all development, would be responsible for an incremental increase in greenhouse gas (GHG) emissions by usage of fossil fuels during site grading and construction. As described in the project description, the trail would be constructed in three phases over three years. The project would result in GHG emissions of approximately 167 MT CO2e during Phase 1, with similar emissions annually for Phases 2 and 3 over the following two years.

In 2013, Santa Cruz County adopted a Climate Action Strategy (CAS) intended to establish specific emission reduction goals and necessary actions to reduce greenhouse gas levels to pre-1990 levels as required under Assembly Bill (AB) 32 legislation. The strategy intends to reduce GHG emissions and energy consumption by implementing measures such as reducing vehicle miles traveled through the County and regional long-range planning efforts and increasing energy efficiency in new and existing buildings and facilities.

Implementing the CAS, the Monterey Bay Community Power (MBCP) was formed in 2017 to provide carbon-free electricity. All PG&E customers in unincorporated Santa Cruz County were automatically enrolled in the MBCP in 2018. Additionally, in 2015, Watsonville adopted the Watsonville CAP to assist the City in preparing for the potential impacts of climate change and protect public health, safety and critical infrastructure. The CAP identifies and prioritizes policies and programs that both reduce GHG emissions and increase the ability of the city to adapt to future climate impacts. Neither the CAS nor CAP establish emissions goals for construction GHG emissions.

All project construction equipment would be required to comply with the CARB emissions requirements for construction equipment. Further, the project would expand alternative transportation opportunities and would be expected to result in a net decrease in GHG emissions following construction. As a result, impacts associated with the temporary increase in GHG emissions would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*	☐	☐	☒	☐

Discussion: See the discussion under H-1 above. The impact would be **Less than Significant**. No mitigation would be required.

I. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*	☐	☐	☒	☐
2. *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?*	☐	☐	☒	☐

Discussion: The project would not create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials, nor through the reasonably foreseeable upset and accident conditions involvement the release of hazardous materials into the environment.

No routine transport or disposal of hazardous materials is proposed. However, during construction, fuel would be used by construction equipment at the project site. In addition, fueling of equipment may occur within the limits of the staging area(s). As stated in the project description, all staging areas would be located within the disturbed road right-of-way where there is adequate room to support construction vehicles and/or materials. All staging areas would be a minimum of 50 feet from any waters, drainages, and the CDFW Ecological Reserve, and would not be located on private property (unless prior agreements are executed). Following project completion, all staging areas and all affected areas within the project area would be returned to pre-project conditions.

Additionally, as stated in the project description, the following BMPs for hazards and hazardous materials would be implemented: Refueling and/or maintenance of vehicles and equipment will be performed in designated staging areas. Workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur. All stationary equipment such as motors, pumps, generators, and/or compressors will be positioned over drip pans. Vehicles and equipment will be stored in designated staging area(s), and parked equipment over drip pans or absorbent material.

Further, as described in Section J-1, the County BMPs that would be included in the SWPPP and sedimentation and erosion control plans require that a hazardous material spill prevention control and countermeasure plan would be developed before construction begins to minimize the potential for and the effects of hazardous or toxic substances spills during construction. The plan would include storage and containment procedures to prevent and respond to spills and would identify the parties responsible for monitoring the spill response. During construction, any spills would be cleaned up immediately according to the spill prevention and countermeasure plan. The County would review and approve the contractors' toxic materials spill prevention control and countermeasure plan before allowing construction to begin. The plan would include the prohibition of the following types of materials from being rinsed or washed into the streets, shoulder areas, or gutters: concrete; solvents and adhesives; thinners; paints; fuels; sawdust; dirt; gasoline; asphalt and concrete saw slurry; heavily chlorinated water

Therefore, the impact would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐

Discussion: The Pajaro Valley High School, 500 Harkins Slough Road, is adjacent to the far north side of the trail alignment, where it extends along Harkins Slough Road. As described above, there would be no routine transport or disposal of hazardous materials. There would be construction-related fuel use near the school during construction of the Lee Road North section. However, the project includes implementation of BMPs to minimize the potential for hazardous emissions such as fuel leaks, thus minimizing the risk near the school. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

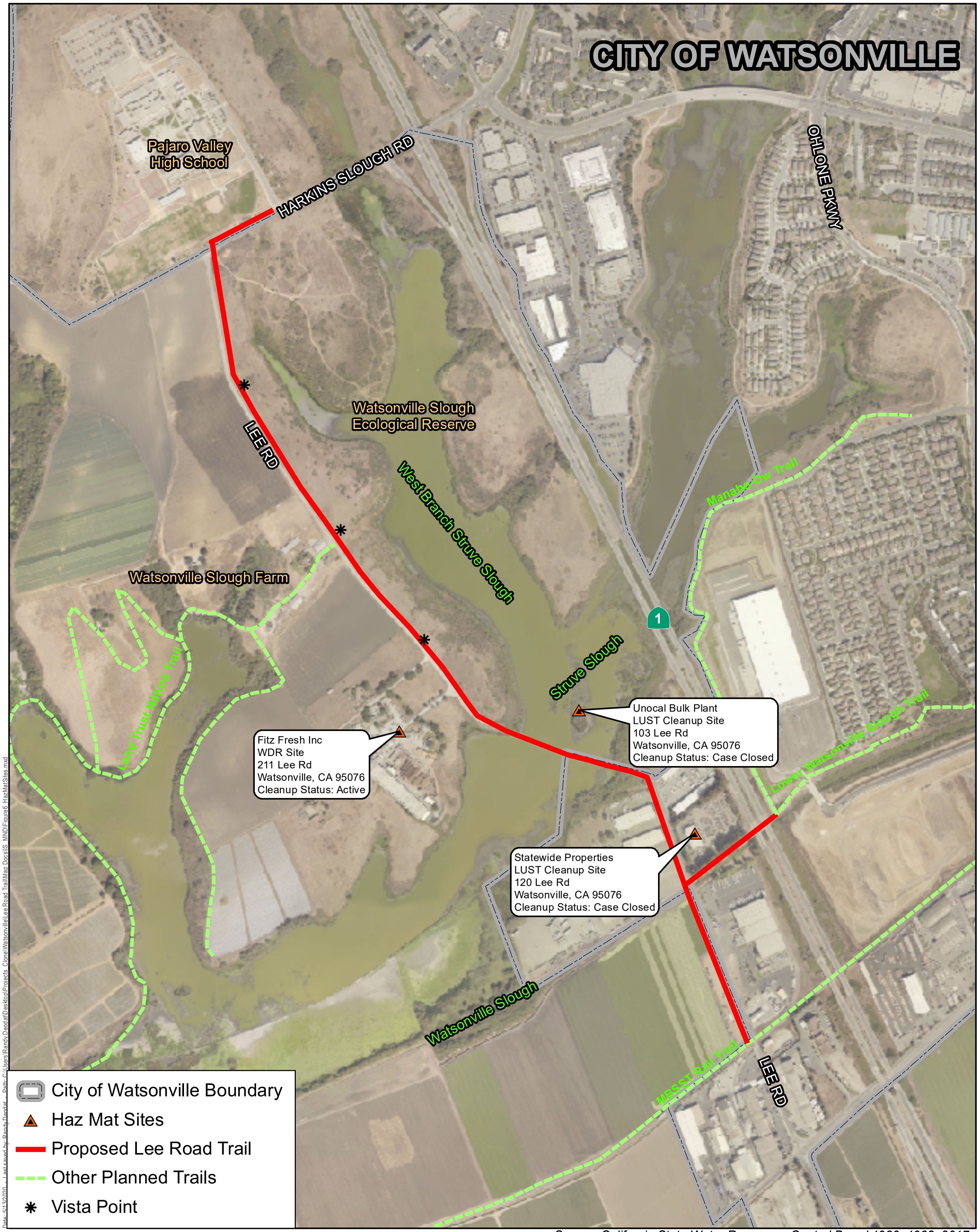
	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
4. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐

Discussion: According to the most recent information on the State of California GeoTracker GIS site, accessed on May 4, 2020, the project area (trail) would extend adjacent to two closed LUST (leaking underground storage tank) sites and one open/active site, as shown in **Figure 7**. The two closed sites are the former Unocal Bulk Site (closed as of 10/13/1992), and the Statewide Properties site (closed as of 10/20/1986). The active site, is located at Fitz Fresh Mushrooms located at 211 Lee Road on the north side of Struve Slough, also shown below. It is a waste discharge requirement (WDR) site, with an active discharge permit issued by the Regional Water Quality Control Board.

None of the three sites would create a significant hazard to the public or the environment, as two sites have been remediated and closed, and one site maintains an active permit and regulatory oversight by the Regional Water Quality Control Board. Furthermore, the active site is on private property, approximately 400-500 feet down a private driveway. Potential users of the project (trail) would not have access to the mushroom farm, and construction activities associated with the proposed bridge would be of sufficient distance and shallow depth, minimizing potential exposure. Therefore, the potential impacts would be **Less than Significant**. No mitigation would be required.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☒	☐

Discussion: The northern most portion of the project area (Lee Road North section) is located approximately 1.15 miles south of the Watsonville Municipal Airport. The project is the construction of a bike/pedestrian recreation trail and would not result in a safety hazard to airport operations or expose people residing or working in the project area to excessive noise. As described in Section M, temporary construction noise impacts would not exceed unreasonable levels and would be similar to normal road noise impacts. Although the project includes a new elevated structure, Struve Slough Bridge, it would be located approximately 2 miles south of the airport, and would be situated at a lower elevation than the surrounding topography to the north. The impact would be **Less than Significant**. No mitigation would be required.



Source: California State Water Resources Control Board 1986, 1992, 2017; County of Santa Cruz Imagery 2016.

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Figure 7

Hazardous Materials Sites

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	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
6. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

Discussion: The proposed trail alignment would not conflict with implementation of the County of Santa Cruz Local Hazard Mitigation Plan 2015-2020 (County of Santa Cruz, 2020b) or other adopted emergency response or evacuation plan. Additionally, as stated in the project description, the construction contractor would ensure emergency vehicle access during construction; and once constructed, the pedestrian/bicycle trail including the Struve Slough Bridge section would be accessible by emergency vehicles (cars, ambulances, and small trucks, but not large fire engines). This would ensure emergency vehicle access in the project area. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
7. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

Discussion: The project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. There would be **No Impact**. Refer to the discussion in Section T-2.

J. HYDROLOGY, WATER SUPPLY, AND WATER QUALITY

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐

Discussion: The project area includes Struve Slough and Watsonville Slough. The project has the potential to generate water quality impacts throughout construction activities if erosion or sedimentation occurs, or hazardous materials are stored or spilled, adjacent to these waterbodies.

As described in the project description under Erosion and Water Quality BMPs, the project would result in ground disturbance of over an acre of land, which requires preparation of a Stormwater Pollution Prevention Plan (SWPPP) that would include sedimentation and erosion control plans, in accordance with the 2009-0009-DWQ Construction General Permit[7]. Within the SWPPP, standard County BMPs to minimize erosion and sedimentation would be included. The BMPs included would be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable and are subject to review and approval by the County. The County would perform routine inspections of the construction area to verify the BMPs are properly implemented and maintained, and would notify contractors immediately if there was a noncompliance issue and would require compliance.

The BMPs would include, but are not limited to, the following measures.

- All earthwork or foundation activities involving sloughs, ephemeral drainages, and culverts would occur in the dry season (generally between April 15 and October 15).
- A netting and tarp system at the Struve Slough Bridge site would be installed to prevent and minimize debris from entering the river during demolition and construction activities.
- Equipment used in and around sloughs, drainages, and wetlands would be in good working order and free of dripping or leaking engine fluids. All vehicle maintenance would be performed at least 300 feet from all sloughs, drainages, and wetlands. Any necessary equipment washing would be carried out where the water cannot flow into sloughs, drainages, and wetlands.
- A hazardous material spill prevention control and countermeasure plan would be developed before construction begins that would minimize the potential for and the effects of hazardous or toxic substances spills during construction. The plan would include storage and containment procedures to prevent and respond to spills and would identify the parties responsible for monitoring the spill response. During construction, any spills would be cleaned up immediately according to the spill prevention and countermeasure plan. The County would review and approve the contractors' toxic materials spill prevention control and countermeasure plan before allowing construction to begin. The plan would include the prohibition of the following types of materials from being rinsed or washed into the streets, shoulder areas, or gutters: concrete; solvents and adhesives; thinners; paints; fuels; sawdust; dirt; gasoline; asphalt and concrete saw slurry; heavily chlorinated water.
- Water quality measurements, including baseline turbidity, pH, specific conductance, and temperatures in Struve Slough and Watsonville Slough would occur during all

[7] [1] State Water Resources Control Board, Storm Water Program, Section II.C.2 of 2009-0009-DWQ Construction General Permit as amended by 2010-0014-DWQ & 2012-0006-DWQ. https://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

work within these water bodies. As required by the Central Coast RWQCB, the project would avoid exceeding water quality standards specified in the Basin Plan standards over the natural in-situ conditions. If dewatering activities are required, water samples would be taken periodically during construction to ensure that overall water quality was being maintained throughout project implementation.

- Any surplus concrete rubble, asphalt, or other rubble from construction would be hauled offsite to a local landfill.
- Discharge from dewatering operations, if needed, and runoff from disturbed areas, would be made to conform to the water quality requirements of the waste discharge permit issued by the RWQCB.
- Temporary erosion control measures, such as sandbagged silt fences, would be applied throughout construction of the project and would be removed after the working area is stabilized or as directed by the engineer. Soil exposure would be minimized through use of temporary BMPs, groundcover, and stabilization measures. Exposed dust-producing surfaces would be sprinkled daily, if necessary, until wet; this measure would be controlled to avoid producing runoff. Paved streets would be swept daily following construction activities.
- The contractor would conduct periodic maintenance of erosion and sediment control measures.
- An appropriate seed mix of native species would be planted on disturbed areas upon completion of construction.
- Cover or application of nontoxic soil stabilizers would be added to inactive construction areas (previously graded areas inactive for 10 days or more) that could contribute sediment to waterways.
- Stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways would be enclosed and covered. Material stockpiles would be located in non-traffic areas only. Side slopes would not be steeper than 2:1. All stockpile areas would be surrounded by a filter fabric fence and interceptor dike.
- All soil and filter runoff would be contained from disturbed areas by berms, vegetated filters, silt fencing, straw wattle, plastic sheeting, catch basins, or other means necessary to prevent the escape of sediment from the disturbed area.
- Temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary re-vegetation or other ground cover) to control erosion from disturbed areas would be installed as necessary.

- Earth or organic material would not be deposited or placed where it may be directly carried into the channel.
- All areas that are disturbed/compacted during construction would be stabilized, vegetated, and de-compacted, as necessary, so that runoff rates from landscaped and pervious areas do not exceed those from pre-disturbed/natural conditions.

Implementation of the BMPs that are identified in the project SWPPP would avoid and minimize water quality impacts to Struve and Watsonville Sloughs and their tributaries. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐

Discussion: The project would only use small amounts of water during construction for dust control and concrete work, and it would be provided by the construction contractor through use of a water truck. No water use would be required during the operational phase of the project.

The project area is located adjacent to both Struve and Watsonville Sloughs, which are part of the Watsonville Slough Watershed Area. The Watsonville Slough system is comprised of six individual sloughs including, both Struve and Watsonville Sloughs, and drains 14 square miles from the hills of southern Santa Cruz County into the Pajaro River and Monterey Bay. The sloughs within the watershed represent significant water supply resources, part of which are being used to offset salt-contaminated coastal groundwater wells in the region. Therefore, the infiltration of the waters within the project area are vital to maintaining a sustainable groundwater basin for the County.

During project construction, there would be excavation ranging from between 12 to 18 inches for the construction of the trail sections and drainage improvements, and up to 125 feet for the piers associated with the construction of the Struve Slough Bridge. Initial groundwater investigations, undertaken as part of the Hydrologic and Hydraulic Analyses conducted by Balance Hydrologics (2020a) (**Attachment G**), found that groundwater exists between 9 and 15 feet below ground. Therefore, the construction of the trails and drainage improvements would not result in impacts to local groundwater.

The new Struve Slough Bridge section would require boring up to 125 feet for the bridge piers, which would result in the discovery of groundwater. However, all construction activities within this area would occur within water. As described above, BMPs would be required to protect water quality and would be applicable to any groundwater encountered through boring activities, minimizing potential impacts to water quality.

As stated in the project description (**Table 1**), project implementation would result in an increase of up to 1.59 acres of additional impermeable surfaces that would be spread out over the 1.4-mile-long trail alignment. This includes the 0.33 acres of impermeable surfaces that comprise the Struve Slough Bridge. Throughout the Struve Slough Bridge section, there would be no changes in impermeable surfaces as the bridge would be constructed over the slough. The remaining trail sections would be constructed adjacent to existing roadways and/or replace existing trails that are comprised of compacted materials, providing poor infiltration opportunities.

The proposed trail alignments would be designed to sheet flow runoff into the existing storm drain system. The amount of runoff would remain largely unchanged, and the water would continue to be conveyed in a similar manner to existing conditions through the existing storm drain system, with the proposed altered and new drainage facilities (described in the project description under Drainage and Culvert Improvements). The unpaved lands along the new trail alignment would remain unpaved following project implementation and would continue to allow infiltration into the local groundwater wells. In the southern portion of the Lee Road North section of the trail, the proposed vegetated bioswale on the uphill side of the trail would capture and convey stormwater runoff to a rock-lined infiltration basin north of the Struve Slough Bridge, and the proposed bioswale on the downhill side of the trail would convey stormwater to the slough, similar to existing conditions.

Therefore, based on the minor changes to impervious surfaces throughout the project area and storm drainage system, and based on the proposed drainage improvements, the changes in the ability of the project area to support groundwater recharge would not be substantial. This impact would be **Less than Significant**. No mitigation would be required. Refer to Section J-5 for further discussion of sustainable groundwater management.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. *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:*	☐	☐	☒	☐
A. *result in substantial erosion or siltation on- or off-site;*	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
B. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
C. 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;	☐	☐	☒	☐
D. impede or redirect flood flows?	☐	☐	☒	☐

Discussion: Implementation of the project would not alter the course of Struve or Watsonville Sloughs and, as discussed above under H-1 and H-2, would not substantially lead to a decrease in water quality or the additional of substantial impervious surfaces. The proposed drainage improvements would ensure the overall existing drainage pattern in the project area does not change substantially, and the required SWPPP would ensure drainage patterns during construction do not result in erosion or siltation, or an increase in runoff from the site. Because the changes in storm water or runoff into the existing storm drain system would be minor, and the proposed drainage improvements would improve stormwater flow, the existing storm water facilities would be adequate to accommodate the minor increase in stormwater from project implementation, including the up to 1.59 acres of increased impervious surface.

The existing Watsonville Slough channel and culvert that extends under Lee Road does not currently have adequate capacity to pass a 100-year flood event. Excessive flows currently flow over Lee Road, moving across the roadway where the water is diverted into the existing storm drain system or passes across the road and under the guardrail, returning into the Watsonville Slough channel. As described in the project description under Drainage and Culvert Improvements, the project includes replacement of the existing culvert, two aged 60-inch CMPs, with a box culvert when Lee Road is widened in this section to accommodate the new bike lanes. The proposed replacement culvert would be a precast concrete box culvert with an invert elevation of 5 feet, a crown elevation of 10 feet (and therefore a rise of 5 feet), a width/span of 10 feet, and a length of 55 feet. The preliminary modeling results for the existing and proposed conditions, show the proposed culvert design would not cause a rise in the 100-year water service elevation of the Watsonville Slough at the project location (Balance Hydrologics 2020b) (**Attachment H**).

Because the project would not substantially alter the existing drainage pattern of the project area that would result in water quality degradation, increase the rate of surface runoff, exceed

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

the capacity of the existing storm drain system or redirect flood flows, this impact would be **Less than Significant**. No mitigation would be required.

4. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐

Discussion: According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Map, dated September 29, 2017, the entire project area is located within designated flood hazard zones. The area within Struve Slough and Watsonville Slough are designated as being within Zone AE, a high-risk zone; and the remainder of the project area is designated as Zone A or V, both designated as special flood hazard areas.

The project has been designed to meet the minimum flood plain management standards of the National Flood Insurance Program and the minimum flood plain design criteria in County Code section 16.10.070(F)(3). This includes the design of the Struve Slough Bridge, which would be approximately 1 foot higher than the maximum flood level that has been modeled for a 100-year flood event, and replacement of the Watsonville Slough culvert beneath Lee Road, as described above. Because the proposed design is replacement of an existing culvert, the total fill in the floodplain fringe is anticipated to be less than 50 cubic yards and, therefore, in compliance with the Santa Cruz County ordinance requiring that no more than 50 cy of fill are incorporated into the floodplain (Balance Hydrologics 2020b).

There are two primary types of tsunami vulnerability in Santa Cruz County. The first is a teletsunami or distant source tsunami from elsewhere in the Pacific Ocean. This type of tsunami is capable of causing significant destruction in Santa Cruz County. However, this type of tsunami would usually allow time for the Tsunami Warning System for the Pacific Ocean to warn threatened coastal areas in time for evacuation (County of Santa Cruz 2016).

A greater risk to the County of Santa Cruz is a tsunami generated as the result of an earthquake along one of the many earthquake faults in the region. Even a moderate earthquake could cause a local source tsunami from submarine landsliding in Monterey Bay. A local source tsunami generated by an earthquake on any of the faults affecting Santa Cruz County would arrive just minutes after the initial shock. The lack of warning time from such a nearby event would result in higher causalities than if it were a distant tsunami (County of Santa Cruz 2016).

Seiches are recurrent waves oscillating back and forth in an enclosed or semi-enclosed body of water. They are typically caused by strong winds, storm fronts, or earthquakes. The project area is located approximately 3 miles inland from the Monterey Bay, and 2 miles inland from Pajaro Dunes, the closest tsunami inundation area. The project area contains both Struve and

Watsonville Sloughs; however, these water bodies are not enclosed or semi-enclosed and would not support a seiche.

Because the project would not result in the production of pollutants and would not result in an increased risk of the project area due to flooding, tsunami or seiche, this impact would be **Less than Significant**. No mitigation would be required.

5. *Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?*	☐	☐	☒	☐

Discussion: All County water agencies are experiencing a lack of sustainable water supply due to groundwater overdraft and diminished availability of streamflow. Because of this, coordinated water resource management has been of primary concern to the County and to the various water agencies. As required by state law, each of the County's water agencies serving more than 3,000 connections must update their Urban Water Management Plans (UWMPs) every five years, with the most recent updates completed in 2016.

County staff are working with the water agencies on various integrated regional water management programs to provide for sustainable water supply and protection of the environment. Effective water conservation programs have reduced overall water demand in the past 15 years, despite continuing growth. In August 2014, the Board of Supervisors and other agencies adopted the Santa Cruz Integrated Regional Water Management (IRWM) Plan Update 2014, which identifies various strategies and projects to address the current water resource challenges of the region. Other efforts underway or under consideration are stormwater management, groundwater recharge enhancement, increased wastewater reuse, and transfer of water among agencies to provide for more efficient and reliable use.

The County is also working closely with water agencies to implement the Sustainable Groundwater Management Act (SGMA) of 2014. By January 2020, Groundwater Sustainability Plans will be developed for two basins in Santa Cruz County that are designated as critically over drafted, Santa Cruz Mid-County and Corralitos - Pajaro Valley. These plans will require management actions by all users of each basin to reduce pumping, develop supplemental supplies, and take management actions to achieve groundwater sustainability by 2040. A management plan for the Santa Margarita Basin will be completed by 2022, with sustainability to be achieved by 2042.

The project is located in the Corralitos – Pajaro Valley Groundwater Basin. The Pajaro Valley Water Management Agency (PVWMA) completed its Basin Management Plan update in 2014, is bringing its plan into full compliance with SGMA, and is scheduled to complete the updated plan January 2022.

Since the sustainable groundwater management plan is still being developed, the project will comply with SCCC Chapters 13.13 (Water Conservation – Water Efficient Landscaping), 7.69 (Water Conservation) and 7.70 (Water Wells), as well as Chapter 7.71 (Water Systems) section 7.71.130 (Water use measurement and reporting), to ensure that it will not conflict with or obstruct implementation of current water quality control plans or sustainable groundwater management plans such as the Santa Cruz IRWMP and UWMP for the PVWMA.

Implementation of the project would not require the use of water, outside of a small amount that would be required for dust abatement during project construction. The project would also not require the use of any groundwater resources. Therefore, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. This impact would be **Less than Significant**. No mitigation would be required.

K. LAND USE AND PLANNING

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. Physically divide an established community?	☐	☐	☐	☒

Discussion: The project and potential alignment alternatives do not include any elements or features that will physically divide an established community. The new trail would provide a connection for the community on the east side of Highway 1 where the community is currently divided by the unpassable, submerged portion of Lee Road through Struve Slough which is considered beneficial. There would be **No Impact**.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐

Discussion: The project would not cause a significant environmental impact due to a conflict with any land use plan, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect. The project would be consistent with the City of Watsonville Trails & Bicycle Master Plan for the Watsonville Scenic Trails Network (City of Watsonville 2012), as well as City of Watsonville General Plan and County of Santa Cruz General Plan policies encouraging bicycle/pedestrian use.

County of Santa Cruz General Plan policy 5.2.3 (Activities Within Riparian Corridors and Wetlands) states: "Development activities, land alterations and vegetation disturbance within riparian corridors and wetlands and required buffers shall be prohibited unless an exception is granted per the Riparian Corridor and Wetlands Protection ordinance". The project would require approval of a Riparian Exception in order to be consistent with the County of Santa Cruz Riparian Corridor and Wetlands Protection Ordinance. Preliminary analysis has determined that the project complies with these findings. The project is therefore consistent with the County of Santa Cruz Riparian Corridor and Wetlands Protection Ordinance, and impacts from project implementation would be **Less than Significant**. Refer to the discussion in Section D-2 and D-3.

L. MINERAL RESOURCES

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. 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?	☐	☐	☐	☒

Discussion: The project area does not contain any known mineral resources that would be of value to the region and the residents of the state. Therefore, **No Impact** is anticipated from project implementation.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. 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?	☐	☐	☐	☒

Discussion: As shown in the Planning Policies section at the beginning of this IS/MND, the project area is a mixture of zoning classifications in both the County of Santa Cruz and City of Watsonville. Within the County, none of the zoning classifications are considered to be an Extractive Use Zone (M-3) nor do any have a land use designation with a Quarry Designation Overlay (Q) (County of Santa Cruz 1994). Furthermore, none of the City classifications are identified as mineral rich/dependent. Therefore, no potentially significant loss of availability of a known mineral resource of locally important mineral resource recovery (extraction) site delineated on a local general plan, specific plan or other land use plan would occur as a result of this project. Therefore, there would be **No Impact**.

M. NOISE

Would the project result in:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. 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?	☐	☐	☒	☐

Discussion:

General Plans

Neither the County of Santa Cruz nor City of Watsonville has adopted noise thresholds for construction noise. The following applicable noise related policy is found in the Public Safety and Noise Element of the Santa Cruz County General Plan (Santa Cruz County 1994).

- Policy 6.9.7 Construction Noise. Require mitigation of construction noise as a condition of future project approvals.

The Santa Cruz County General Plan also contains the following table, which specifies the maximum allowable noise exposure for stationary noise sources (operational or permanent noise sources) (**Table 6).**

Table 6. Maximum Allowable Noise Exposure for Stationary Noise Sources[1]

	Daytime[5] (7:00 am to 10:00 pm)	Nighttime[2, 5] (10:00 pm to 7:00 am)
Hourly Leq average hourly noise level, dB[3]	50	45
Maximum Level, dB[3]	70	65
Maximum Level, dB – Impulsive Noise[4]	65	60

Notes:
1 As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied to the receptor side of noise barriers or other property line noise mitigation measures.
2 Applies only where the receiving land use operates or is occupied during nighttime hours
3 Sound level measurements shall be made with “slow” meter response.
4 Sound level measurements shall be made with “fast” meter response
5 Allowable levels shall be raised to the ambient noise levels where the ambient levels exceed the allowable levels. Allowable levels shall be reduced to 5 dB if the ambient hourly Leq is at least 10 dB lower than the allowable level.
Source: County of Santa Cruz 1994

The City of Watsonville General Plan does not include policies or standards related to construction noise.

County of Santa Cruz Code

There are no County of Santa Cruz ordinances that specifically regulate construction or operational noise levels. However, Section 8.30.010 (Curfew—Offensive noise) of the Santa Cruz County Code contains the following language regarding noise impacts:

(A) No person shall make, cause, suffer, or permit to be made any offensive noise.

(B) “Offensive noise” means any noise which is loud, boisterous, irritating, penetrating, or unusual, or that is unreasonably distracting in any other manner such that it is likely to disturb people of ordinary sensitivities in the vicinity of such noise, and includes, but is not limited to, noise made by an individual alone or by a group of people engaged in any business, activity, meeting, gathering, game, dance, or amusement, or by any appliance, contrivance, device, tool, structure, construction, vehicle, ride, machine, implement, or instrument.

(C) The following factors shall be considered when determining whether a violation of the provisions of this section exists:

(1) Loudness (Intensity) of the Sound.

(a) Day and Evening Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 8:00 a.m. and 10:00 p.m. and it is:

(i) Clearly discernible at a distance of 150 feet from the property line of the property from which it is broadcast; or

(ii) In excess of 75 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data.

A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

(b) Night Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 10:00 p.m. and 8:00 a.m. and it is:

(i) Clearly discernible at a distance of 100 feet from the property line of the property from which it is broadcast; or

(ii) In excess of 60 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data.

A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

(2) Pitch (frequency) of the sound, e.g., very low bass or high screech;

(3) Duration of the sound;

(4) Time of day or night;

(5) Necessity of the noise, e.g., garbage collecting, street repair, permitted construction activities;

(6) The level of customary background noise, e.g., residential neighborhood, commercial zoning district, etc.; and

(7) The proximity to any building regularly used for sleeping purposes. [Ord. 5205 § 1, 2015; Ord. 4001 § 1, 1989]

Watsonville Municipal Code

There are no City of Watsonville ordinances that specifically regulate construction or operational noise levels. However, Section 5-8.01 of the Watsonville Municipal Code states that between the hours of 10:00 pm and 7:00 am it shall be unlawful for any person on residential property or a public way to make or continue, or cause to be made or continued, any offensive, excessive, unnecessary, or unusually loud noise or any noise which either annoys, disturbs, injures, or endangers the comfort, repose, health, peace, or safety of others on residential property or public ways within the City. The ordinance is specifically concerned with the using, operating, or permitting to be played, used, or operated of any radio receiving set, musical instrument, phonograph, stereo, television, or other machine or device for producing or reproducing sound in such a manner as to disturb the peace, quiet, and comfort of neighboring residential inhabitants.

Impacts

Construction

The use of construction equipment to accomplish the project would result in temporary noise in the project area, i.e., construction zone. **Table 7** shows typical noise levels for common construction equipment. The sources of noise that are normally measured at 50 feet, are used to determine the noise levels at nearby sensitive receptors by attenuating 6 dB for each doubling of distance for point sources of noise such as operating construction equipment. Noise levels are analyzed on a worst-case basis, using the equipment with the highest noise level expected to be used.

Although construction activities would likely occur during daytime hours, noise may be audible to nearby sensitive receptors. However, periods of noise exposure would be temporary. Due to the linear nature of the project, an individual receptor's exposure to construction noise would be limited to a few weeks.

As stated in the project description, anticipated equipment includes drill rigs, cranes, excavators, and dump trucks. There would be drilling but no pile driving. Based on the activities proposed for the project, the equipment with the loudest operating noise level that would be used often during activity would be excavators, dozers, and rollers, which would produce noise levels of 85 dBA at a distance of 50 feet. The nearest sensitive receptor is Pajaro Valley High School. The school athletic fields are located approximately 100 feet from the construction site. At that distance, the decibel level is reduced by approximately 6 dBA to 79 dBA decibels. Additionally, classrooms are located more than 450 feet from the construction area. Noise levels at this distance would be reduced to 66 dBA, which is just above normal conversation levels and would be unlikely to be a nuisance. Noise levels would be reduced to approximately 74 dBA at the rural residence on the south side of Struve Slough, 69 dBA at the hotel located north of W. Beach Street, and 67 dBA at the rural residence on the north side of Struve Slough. However, the existing rural residences and hotel in the project vicinity are currently subject to heavy vehicle noise from Highway 1, existing industrial noise, and farm equipment and truck activity associated with farming operations. It is unlikely that construction noise would be noticeably audible over these existing noise sources to the point of causing a nuisance. Additionally, construction would not occur during nighttime hours when the residences and hotel would be most sensitive to noise. These impacts would also be temporary, and noise exposure would decrease with distance.

Noise generated during project construction would potentially increase the ambient noise levels in adjacent areas. Construction would be temporary, and construction hours would be limited as a condition of approval. Therefore, this impact is considered less than significant with no mitigation required.

Table 7. Typical Noise Levels for Common Construction Equipment (at 50 feet)

Equipment	Lmax (dBA)
Air Compressor	80
Backhoe	80
Chain Saw	85
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Saw	90
Crane	83
Dozer	85
Dump Truck	84
Excavator	85
Flat Bed Truck	84
Fork Lift	75
Generator	82
Grader	85
Hoe-ram	90
Jack Hammer	88
Loader	80
Paver	85
Pick-up Truck	55
Pneumatic Tool	85
Roller	85
Tree Chipper	87
Truck	84

Source: Federal Transit Authority, 2006, 2018.

Operation

Following construction, operation of the proposed project would not be anticipated to generate more than a nominal increase in vehicle trips to and from the trail for maintenance activities. Therefore, operation of the proposed project would not result in a permanent increase in ambient vehicle noise levels.

Operational noise levels along the proposed trail alignment would be influenced by the sound of trail users talking, occasional animal sounds, as well as occasional maintenance of proposed project features. New noise sources would be intermittent and typically limited to normal conversation. Normal conversation typically results in a noise level of 65 dBA Leq at three feet (Caltrans 2013). As such, intermittent noise would not exceed conversational levels at the nearest receptors and would not result in nuisance noise levels.

Regular maintenance activities may include occasional repairs that would potentially involve the use of power equipment. It is currently unknown what type of equipment would be required for occasional repairs. A leaf blower, or similar equipment, is anticipated to be used for landscaping or to clear debris from the trail. Therefore, a typical leaf blower is assumed to represent conditions from operation of equipment for routine maintenance. Newer leaf blowers typically generate noise levels of 65 dBA or below at 50 feet from the equipment. However, older leaf blowers generate an average noise level of 78 dBA at 50 feet (Long Beach 2017). This noise level is similar to smaller pieces of construction equipment (described above) and is assumed a worst-case noise level for maintenance and operation activities. Maintenance would be occasional, limited in duration, and due to distance, generally not audible above ambient conditions at the nearest sensitive receptors. Thus, maintenance of the trail would not be expected to generate a noticeable increase in ambient noise levels compared to existing conditions. The impact would be less than significant with no mitigation required.

Therefore, construction and operational impacts of the proposed project would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐

Discussion: The use of construction and grading equipment would potentially generate periodic vibration in the project area. Due to the linear nature of the project, construction would generally be separated from the nearest structures by more than 100 feet. The equipment required for the project with the potential to generate the highest level of vibration is a vibratory roller, which typically generates vibration levels of 0.21 PPV at 25 feet (FTA 2018). At 100 feet, vibration would be reduced to 0.03 PPV, which is below the Federal Transit Administration potential damage criteria of 0.12 PPV for buildings highly susceptible to damage (FTA 2018). This impact would be temporary and periodic and is not expected to cause damage. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. 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?	☐	☐	☒	☐

Discussion: The project is located approximately one mile south of the Watsonville Municipal Airport. However, the project proposes a recreational trail that would not be sensitive to flight noise. The project would not expose people residing or working in the project area to aircraft noise. Although the project would include a new bridge (raised structure), it would be at the Struve Slough crossing which is surrounded by higher topography on the north side and well outside the Safety Compatibility Zones. Therefore, the impacts would be **Less than Significant**. No mitigation would be required.

N. POPULATION AND HOUSING

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. 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)?	☐	☐	☐	☒

Discussion: The project (trail) would not induce substantial population growth in an area because the project does not propose any physical or regulatory change that would remove a restriction to or encourage population growth in an area including, but limited to the following: new or extended infrastructure or public facilities; new commercial or industrial facilities; large-scale residential development; accelerated conversion of homes to commercial or multi-family use; or regulatory changes including General Plan amendments, specific plan amendments, zone reclassifications, sewer or water annexations; or LAFCO annexation actions. Furthermore, the project would not extend the road(s) or increase capacity. There would be **No Impact**.

2. *Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?*	☐	☐	☐	☒

Discussion: The project and alignment alternatives would not displace any existing housing and would not require the construction of any replacement housing. There would be **No Impact**.

O. PUBLIC SERVICES

Would the project:

1. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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
a. *Fire protection?*	☐	☐	☒	☐
b. *Police protection?*	☐	☐	☒	☐
c. *Schools?*	☐	☐	☒	☐
d. *Parks?*	☐	☐	☒	☐
e. *Other public facilities; including the maintenance of roads?*	☐	☐	☒	☐

***Discussion (a through e)*:**

Fire. Fire protection services in the project area are provided by the City of Watsonville Fire Department (FD) within the incorporated areas and by Santa Cruz County Fire Department in cooperation with Cal Fire and Volunteer Firefighters. The closest fire stations to the project area are: Watsonville FD 1 (115 Second Street, Watsonville), 1.4 miles from the south end of the trail alignment; Watsonville FD 2 (370 Airport Blvd, Watsonville), 1.4 miles from the north end of the trail alignment, and Pajaro Dunes Fire Station 42 (2661 Beach Road, Watsonville), 3 miles from the south end.

Police. Police protection services in the project area are provided by the City of Watsonville Police Department within the incorporated areas and by the Santa Cruz County Sheriff in the unincorporated areas. There is currently a City police officer present at Pajaro Valley High School who patrols the area for truants and illegal activity around the school, including the northern portion of the project area.

Schools. The Pajaro Valley Unified School District serves the project area, with the closest school being Pajaro Valley High School located adjacent to the project area on the north side of Harkins Slough Road.

Parks. Park services in the project area are provided by the City of Watsonville Parks Department and the Santa Cruz County Parks Department. The closest park to the project area is Seaview Ranch Park, a residential neighborhood park located at 105 Lighthouse Drive, 0.25 mile east of the proposed trail terminus of the Watsonville Slough section on the east side of Highway 1. The proposed trail Watsonville Slough section would connect to existing trails leading to Seaview Ranch Park and the Watsonville Slough trail system.

Other. Other public facilities, including the maintenance of roads, in the project area are generally provided by the City of Watsonville and Santa Cruz County Public Works Departments, both of whom would provide ongoing maintenance to the public roads within their respective jurisdictions. County Public Works is currently patrolling the unincorporated area north of Struve Slough for garbage dumping.

The project would not generate a population needing public services, such as parks and schools. The proposed trail would provide a safer pedestrian and bicycle connection to, from and between existing school and park facilities (e.g., Pajaro Valley High School, Seaview Ranch Park, Watsonville Slough trail system), as well as planned trails as described in Section P, Recreation. This is considered a beneficial effect.

The project would provide a new trail that would require maintenance by the City Public Works Department. As described in the project description under Trail Maintenance, the trail would be operated and maintained by the City public works department.

Trail users or maintenance personnel could request police or emergency service (e.g., fire or first responders). However, the level of service anticipated would not result in the need for the provision of new or physically altered governmental facilities (e.g., police or fire stations), the construction of which could cause significant environmental effects, in order to maintain acceptable service ratios or response times (Lopez, Pursley, Thul pers. comms.). Police and sheriff patrol primarily from their vehicles, and there are fire stations less than 1.5 miles from each end of the trail alignment. The project signage would prohibit smoking along the undeveloped open space in the northern portion, which would reduce fire risk and need for fire service. The trail is adjacent to existing public roadways, and the trail and bridge could accommodate emergency vehicles, if necessary, which would facilitate response time.

Property owners have expressed concern about public safety and security with respect to transient or homeless encampments, loitering, and illegal activity, particularly at nighttime. As described in the project description under Trail Operation, trail usage would be limited to daylight hours from dawn to dusk. There is existing street lighting along the Lee Road Middle and Lee Road South sections, on the south side of Struve Slough. Additional lighting may be included for security along these sections, the Watsonville Slough Trail section extending beneath Highway 1, and the Struve Slough Bridge section, subject to California Coastal Commission requirements and approval.

The City of Watsonville Police Department and County of Santa Cruz Sheriff would routinely patrol portions of the trail within their respective jurisdictions. The City Police Department would continue to have a police officer present at the school to patrol the area for truants and illegal activity. County Public Works would continue to patrol for garbage dumping every 1-2 weeks. There would be bi-weekly monitoring for trail maintenance, which includes monitoring for loitering, encampments, and illegal activity along the public trail that would be reported to City and/or County law enforcement, depending on the jurisdiction. Patrol and maintenance would be performed to ensure presence along the trail at least weekly. Monitoring once or twice weekly is considered appropriate frequency by the Land Trust of Santa Cruz County, which operates and maintains trails in the County (Largay pers. comm.).

Additionally, the County would post “no parking” or “limited parking” (no nighttime parking) signs along Lee Road in the Lee Road North section. Initially, the signs would be posted on the trail side where there is no room for parking for safety because the trail is only five feet from the road. Parking restrictions would be increased as necessary (e.g., on both sides of the road) if the County receives frequent public nuisance for safety and security.

Further, portions of the trail include fencing with native vegetation, such as California blackberry and wild rose, to deter trespassing into the Reserve in the northern portion and agricultural land in the southern portion.

Therefore, the impact to these public services and public safety would be **Less than Significant**. No mitigation would be required.

P. RECREATION

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. 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?	☐	☐	☒	☐

Discussion: The project involves the installation of a new pedestrian/bicycle trail along Harkins Slough Road and Lee Road, which would potentially increase pedestrian and bicycle traffic along these roads, connecting trails, and throughout the existing neighborhoods and neighborhood parks and open spaces, particularly when the project is built out after all five sections are constructed. However, the increased use of existing neighborhood and regional parks or other recreational facilities is expected to be relatively minor, such that substantial physical deterioration of the facilities would not occur or be accelerated. As a public trail, the project would create additional recreation opportunities which would be considered a potentially beneficial impact regarding recreation and could reduce impacts to other recreation facilities, by providing another recreation option to residents of Watsonville and Santa Cruz County. Therefore, the impacts would be **Less than Significant**. No mitigation would be required.

2. *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?*	☐	☐	☒	☐

Discussion: The project would be a new multi-use trail extending for 1.4 miles along Lee Road, from Harkins Slough Road on the north to the railroad tracks on the south. As described in **Table 1**, the proposed project trail alignment would result in approximately 2.17 acres of ground disturbance. The project would not require the construction or expansion of recreational facilities beyond that which has been included as part of the project. The physical effects of the project on environmental resources are analyzed in other sections of this Initial Study, and therefore are not discussed further in this section.

The new multi-use trail would provide an additional recreational amenity in Santa Cruz County and the City of Watsonville that is not currently available in this area west of Highway 1. The new trail would provide an opportunity for the public to walk, run, bicycle, and view nature through open space areas. Additionally, the project would provide an educational opportunity to experience and learn about the natural resources in the area through interpretive signage. This is considered beneficial.

Because the new trail would not require construction or expansion of other recreational facilities beyond that included as part of the project, as well as result in a beneficial effect, this impact would be **Less than Significant**. No mitigation would be required.

Q. TRANSPORTATION

Would the project:

1. *Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?*	☐	☐	☒	☐

Discussion: The trail is a part of and consistent with the City of Watsonville's Trails & Bicycle Master Plan.

The project would create a small incremental increase (de minimis) in traffic on nearby roads and intersections, as potential recreational users may choose to drive to the various trail access points, particularly once all the trail sections are constructed and the nearby Watsonville Slough Farm trail system is in place. The increase would not cause the LOS at any nearby intersection to drop below LOS D, consistent with Santa Cruz County General Plan Policy 3.12.1, for reasons described below.

The trail is estimated to have a total of up to approximately 225 daily users, with 25 bicyclists and 200 pedestrians, throughout the week at full buildout of the project. On weekdays, the users would be predominately high school students accessing Pajaro Valley High School located on Harkins Slough Road. On weekends, the users would be predominately recreationists.

Although there is some truck traffic associated with the industrial land uses south of Struve Slough and the mushroom farm north of Struve Slough, overall the existing traffic volumes on project area roadways are low. The increased vehicle use could be accommodated on the existing roadways with low traffic volumes, and would not cause the LOS at any nearby intersection to drop below LOS D, consistent with General Plan Policy 3.12.1.

Further, as described in the project description under Design Engineering, the project elements (trail, sidewalks, bike lanes) would comply with current road requirements, including the regulations under section 13.11.074 of the County Code, "Access, circulation and parking" to prevent potential hazards to motorists, bicyclists, and/or pedestrians, as well as the County of Santa Cruz Department of Public Works design criteria. In addition, the project is consistent with Policy 7.5.6 of the Santa Cruz County General Plan, which requires the provision of public access around the margins of all major inland water bodies without disturbance to the shorelines. The project would provide a public recreational train around the Struve and Watsonville Sloughs, both being major inland water bodies.

In summary, the trail is consistent with and represents implementation of the City's Trails & Bicycle Master Plan and other City and County programs and plans addressing the circulation system and supporting increased bicycle and pedestrian facilities. The project would provide additional pedestrian/bicycle access and connection where there currently is no pedestrian, bicycle, or vehicular access through the submerged portion of Lee Road. Increased traffic from trail users, resulting from buildout of the project and other trails in the area, would not have a substantial adverse effect on traffic circulation and would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. *Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1) (Vehicle Miles Traveled)?*	☐	☐	☒	☐

Discussion: In response to the passage of Senate Bill 743 in 2013 and other climate change strategies, the Governor's Office of Planning and Research (OPR) amended the CEQA Guidelines to replace LOS with vehicle miles traveled (VMT) as the measurement for traffic impacts. The "Technical Advisory on Evaluating Transportation Impacts in CEQA," prepared by OPR (2018) provides recommended thresholds and methodologies for assessing impacts of new developments on VMT. Tying significance thresholds to the State's GHG reduction goals, the guidance recommends a threshold reduction of 15% under current average VMT levels for residential projects (per capita) and office projects (per employee), and a tour-based reduction from current trips for retail projects. Based on the latest estimates compiled from the Highway Performance Monitoring System, the average daily VMT in Santa Cruz County is 18.3 miles per capita (Department of Finance [DOF] 2018, Caltrans 2018). The guidelines also recommend a screening threshold for residential and office projects—trip generation under 110 trips per day is generally considered a less-than-significant impact.

<u>Impacts</u>

Construction

The project would result in a minor increase in construction-related traffic in and near the project area. Construction vehicles entering or exiting the project area could cause temporary delays or stoppage of through traffic on Harkins Slough Road and Lee Road, as well as within the vicinity of the general project area, which could adversely affect traffic circulation and safety. The increase in vehicles on the roadway would be relatively small, dispersed throughout the day, and short term. The project (trail) would be constructed in phases, with Phase 1 (Lee Road North) being approximately 6 months in duration (2021/2022); Phase 2 (Struve Slough Bridge, Lee Road Middle, and Watsonville Slough) being 12 months (2023/2024); Phase 3 (Lee Road South) being 9 months (2025/2026), as detailed in **Table 1** of the Project Description. Additionally, as described under Best Management Practices, traffic control measures during construction would ensure access is retained.

Operation

Once construction of the pedestrian/bicycle trail is complete, there would be a minor increase in the number of vehicle trips to and from the project area from trail maintenance and patrol activities (anticipated to be twice weekly). This would be offsite by the anticipated reduction in vehicle trips to the high school by providing a safe alternative route to school for students, teachers and families who would otherwise use vehicles. For example, based on the City's zoning map, aerial photos, and the Pajaro Valley High School Attendance Zone, there are 500-

1,000 residences located in the neighborhoods along Ohlone Parkway, south of Loma Vista, which could access the proposed trail from the existing trail on Lighthouse Drive, less than 1,000 feet northeast of the Watsonville Slough trail section that extends beneath Highway 1.

Additionally, as described above in Q-1, there could be increased vehicle trips in the project area once the trail system is built out from recreational trail users who choose to drive to trail access points. This would be a redistribution of vehicle miles traveled by recreational trail users who would otherwise drive to other trail access point. Vehicle travel to the project area would be discouraged by the lack of available parking.

The project does not create new parking areas, and there would be parking restrictions along the northern portion of Lee Road, which would discourage vehicle trips to the area. However, trail users may find parking along portions of Harkins Slough Road, in the Pajaro Valley High School parking lots (when/if gates are open), and in the off-street parking area planned as part of the Watsonville Slough Farm trail system. On the southern end, parking could be available in the parking lot of the hotel/shopping center being constructed at Lee Road near West Beach Street. Nonetheless, it is anticipated that most users would access the trail from existing connecting roadways/trails.

The overall increase in vehicle miles traveled in the project area would be offset by the provision of a non-vehicular pedestrian/bicycle facility which would reduce vehicle miles traveled.

Therefore, the impact would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. *Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*	☐	☐	☒	☐

Discussion: The proposed trail would be ADA accessible and would provide a safe alternative route and connection to PVHS through an area that is currently inaccessible due to the closed portion of Lee Road where it is submerged by Struve Slough. However, the trail would have potential conflict points between recreation users (pedestrians and bicyclists) and vehicular traffic at the crosswalk locations (shown in **Figure 2**) and the driveway crossings.

As described in the project description, the crosswalks would have visible surface striping in accordance with County and City design standards, and there would be “Pedestrian/Bicycle Crossing” warning signs along the roadways approaching the crosswalks. The City and County would install additional signage along the roadway and trail as determined appropriate for safety where the trail crosses driveways. Further, the crosswalks, sidewalks, driveways, and curb ramps would designed in accordance with ADA design standards.

The project design does not include any sharp curves, the grades are ADA compliant, and the bridge has safety railings. Aside from occasional trail maintenance and patrol vehicles, vehicles would be prohibited along the trail.

Therefore, the project would not substantially increase hazards due to geometric design feature (e.g., sharp curves, dangerous intersections) or incompatible uses (e.g., farm equipment). The impact would be **Less than Significant.** No mitigation would be required.

4. Result in inadequate emergency access?	☐	☐	☒	☐

Discussion**:** Temporary lane closures in the public roadways would be required for short periods of time during project construction. As described in the project description under Best Management Practices, traffic control measures include notifying emergency personnel of construction timeframe and the location of planned closures, and retaining emergency access throughout construction. Once constructed, emergency vehicles would be able to access all trail portions, as they would be designed to accommodate smaller emergency vehicles (e.g., police cars, emergency response, small fire trucks), but not larger fire engines. Therefore, the impact would be **Less than Significant.** No mitigation would be required.

R. TRIBAL CULTURAL RESOURCES

1. 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. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources Code section 5020.1(k), or	☐	☒	☐	☐
B. 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.	☐	☒	☐	☐

Discussion: The project proposes to establish a 1.4-mile-long trail along Lee Road in Watsonville and unincorporated Santa Cruz County. Section 21080.3.1(b) of the California Public Resources Code (AB 52) requires a lead agency formally notify a California Native American tribe that is traditionally and culturally affiliated within the geographic area of the discretionary project when formally requested. As of this writing, no California Native American tribes traditionally and culturally affiliated with the Santa Cruz County region have formally requested a consultation with the County of Santa Cruz (as Lead Agency under CEQA) regarding Tribal Cultural Resources.

However, as described in Section E, Cultural Resources, the project area overlaps the Costanoan-Ohlone Cemetery Site, based on the NWIC records search. According to the Phase 1 Archaeological Investigations Report prepared by Albion (2020), the Costanoan-Ohlone Cemetery Site qualifies as a historical resource under CEQA and as a historic property under the National Historic Preservation Act, and that that ground disturbing activities associated with the project have the potential to result in significant impacts to this resource. Therefore, in accordance with SCCC Chapter 16.40, Native American outreach was conducted, and the results included in Albion's report.

The California Native American Heritage Commission was contacted in August 2020 for information from the Commission's Sacred Lands File and a list of Native American stakeholders. The Commission found no information in their files and forwarded the names of six Tribal representatives. Each of these representatives was contacted by letter and follow-up emails and phone calls, describing the project and asking for information or comments. Five representatives provided responses and recommendations outlined in Albion's report.

Recommendations identified in Albion's Phase I Archaeological Investigations Report have been incorporated into the required mitigation below and the County's Conditions of Approval for all phases of development for the proposed project, as applicable. Therefore, this impact would be **Less than Significant with Mitigation**.

Mitigation Measure

CR-1: Conditions of Approval to Minimize Impacts to Cultural Resources and Tribal Cultural Resources. This measure is described above in Section E, Cultural Resources.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

S. UTILITIES AND SERVICE SYSTEMS

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐

***Discussion*:**

Water and Wastewater

The proposed pedestrian/bicycle trail, including the design options, would not require connection to or result in the relocation or construction of new or expanded water or wastewater treatment facilities. There would be **No Impact**.

Stormwater

The proposed pedestrian/bicycle trail would involve the development of an approximately 1.4-mile-long, 12-foot-wide trail along Harking Slough Road and Lee Road (refer to the project description for details on the five trail sections).

As described in the project description (under Drainage and Culvert Improvements and Best Management Practices), the project includes several stormwater and drainage features and improvements, including installation of a bioswale along the trail in the Lee Road North section, replacement of the Watsonville Slough culvert beneath Lee Road, as well as installation of a storm drain pipe where there is currently a non-jurisdictional ditch in the Lee Road South section, to accommodate road widening for the new bike lane. The project description also includes several BMPs for erosion control and to protect water quality during construction.

The evaluation in Section J, Hydrology, Water Supply, and Water Quality found that potential impacts related to stormwater drainage and flooding would be less than significant. The preliminary modeling results for the existing and proposed conditions at the Watsonville Slough culvert demonstrate the proposed culvert design would not cause a rise in the 100-year water service elevation of the Watsonville Slough at the project location (Balance Hydrologics 2020b). Additionally, the capacity of storm drain pipe that would replace the existing ditch along the east side of Lee Road (south of the Watsonville Slough channel), would accommodate existing flow, as well as any nominal increase from the additional pavement.

Overall, the project would result in up to 1.59 acres of new impervious surface (refer to **Table 1**). The addition of up to 1.59 acres of new impervious surfaces, spread out over the 1.4-mile trail length, would be minimal and would not generate a substantial amount of increased runoff. The flows from the proposed trail alignments would generally sheet flow to the adjacent unpaved pervious areas in some sections and storm drain gutters in other sections, similar to existing conditions (refer to Section J, Hydrology, Water Supply and Water Quality). Therefore, it would not result in the need for new or expanded drainage facilities, other than those proposed. The drainage facilities and improvements proposed as part of this project would not result in any significant environmental impacts that cannot be mitigated, as described in other sections of this report. The impact would be **Less than Significant Impact**. No mitigation would be required.

Electric Power and Natural Gas

Pacific Gas and Electric Company (PG&E) provides power to existing and new developments in the Santa Cruz County area. As of 2018, residents and businesses in the County were automatically enrolled in MBCP's community choice energy program, which provides locally controlled, carbon-free electricity delivered on PGE's existing lines. PG&E also serves the urbanized portions of Santa Cruz County with natural gas, and rural areas use propane tanks.

The proposed trail would not require the extension or provision of natural gas or electric power. As described in the Utilities discussion of the Project Description, the project would require the relocation of three utility poles along Harkins Slough Road, two guy wire poles, and a gas main in Lee Road south of Struve Slough. Any potential disruption to service would be coordinated in advance with PG&E or other utility providers. Therefore, the impact would be **Less than Significant**. No mitigation would be required. No mitigation would be required

Telecommunications

Telecommunications, including telephone, wireless telephone, internet, and cable, are provided by a variety of organizations. AT&T is the major telephone provider, and its subsidiary, DirectTV provides television and internet services. Cable television services in Santa Cruz County are provided by Charter Communications in Watsonville and Comcast in other areas of the county. Wireless services are also provided by AT&T, as well as other service providers, such as Verizon.

No improvements related to telecommunications would be required. As described above, existing utility poles and infrastructure would not be disturbed, and any potential disruption to service would be coordinated in advance with service providers. Therefore, the impact would be **Less than Significant**. No mitigation would be required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. *Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?*	☐	☐	☒	☐

Discussion: The project would only use small amounts of water during construction for dust control and concrete work, and sufficient water supplies are available to construction contractors for this purpose. No water use would be required during the operational phase of the project. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. *Result in 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?*	☐	☐	☐	☒

Discussion: No wastewater would be connected to the municipal sewer collection system during construction of the project. No wastewater would be generated during the operational phase of the project. Therefore, **No Impact** would to occur from project implementation.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
4. *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?*	☐	☐	☒	☐

Discussion: The project could not generate solid waste during the operational phase of the project. However, Construction debris and greenwaste would be generated during trail construction, which would include demolition (e.g., pavement removal) and grading in both unpaved and paved areas, much of which would be recycled. Once operational, trail users could use the trash and recycling containers located at the vista points for trash disposal. As described under Trail Maintenance, trash and recycling collection and disposal would occur on a monthly basis or more often if needed. The waste generated would not exceed local or state standards, or require additional landfills or recycling centers. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
5. *Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?*	☐	☐	☐	☒

Discussion: The project would comply with all federal, state, and local statutes and regulations related to solid waste disposal. **No impact** would occur.

T. 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
1. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

Discussion: The project is not located in a State Responsibility Area, a Very High Fire Hazard Severity Zone, or a County-mapped Critical Fire Hazard Area and will not conflict with emergency response or evacuation plans. Therefore, **No Impact** would occur.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. 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?	☐	☐	☒	☐

Discussion: The project is not located in a State Responsibility Areas, a Very High Fire Hazard Severity Zone, or a County-mapped Critical Fire Hazard Area. However, the project design incorporates all applicable fire safety code requirements and is unlikely to exacerbate wildfire risks. Therefore, the impacts would be **Less than Significant**. No mitigation would be required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. 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?	☐	☐	☒	☐

Discussion: The project is not located in a State Responsibility Areas, a Very High Fire Hazard Severity Zone, or a County-mapped Critical Fire Hazard Area. The project would not require installation or maintenance of wildfire infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that would exacerbate the fire risk or impact the environment. Additionally, as described under Trail Operation and Maintenance, no smoking is allowed along CDFW property in the Lee Road North section, and vehicles or equipment used for trail maintenance would use the existing Lee Road and trail itself. Therefore, improvements associated with the project are unlikely to exacerbate wildfire risks. The impacts would be **Less than Significant**. No mitigation would be required.

4. 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?	☐	☐	☒	☐

Discussion: The project is not located within a State Responsibility Areas, a Very High Fire Hazard Severity Zone, or a County-mapped Critical Fire Hazard Area. Downslope and downstream impacts associated with wildfires are unlikely to result from the project. Regardless, the project design incorporates all applicable fire safety code requirements and includes fire protection devices as required by the local fire agency. Additionally, the trail, including the Struve Slough Bridge section, would be located at least 1 foot above the 100-year flood elevation. Therefore, the impact would be **Less than Significant**. No mitigation would be required.

U. MANDATORY FINDINGS OF SIGNIFICANCE

1. 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 community or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐

Discussion:

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 were considered in the response to each question in Section III (A through T) of this Initial Study.

As described in the project description, the project would implement Best Management Practices and comply with applicable regulations and standards, which avoids and reduces potentially significant environmental impacts. However, mitigation measures are required to reduce potentially significant impacts to Biological Resources and Cultural Resources to a less than significant level. Mitigation Measures BIO-1 to BIO-10 reduce impacts to California red legged frog, Western pond turtle, nesting birds, San Francisco dusky-footed woodrat, roosting bats, sensitive habitat, and wetlands. Mitigation Measure CR-1 reduces impacts to archaeological and historical resources. As a result of this evaluation, there is no substantial evidence that, after mitigation, significant effects associated with this project would result. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

2. *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)?*	☐	☐	☒	☐

Discussion: In addition to project specific impacts, this evaluation considered the project's potential for incremental effects that are cumulatively considerable. As a result of this evaluation, there were determined to be no potentially significant cumulative effects associated with this project. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

3. *Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?*	☐	☐	☒	☐

Discussion: In the evaluation of environmental impacts in this Initial Study, the potential for adverse direct or indirect impacts to human beings were considered in the response to specific questions in Section III (A through T). As a result of this evaluation, no potentially adverse effects to human beings associated with this project were identified. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

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Initial Study Attachments

The Initial Study includes the following attachments, hereby incorporated by reference and available with the County of Santa Cruz.

Attachment A Required Mitigation Measures
Attachment B Representative Photographs of the Project Area
Attachment C Air Quality Model Output (April 2020)
Attachment D Biotic Assessment (October 2020) and Approval Letter from County of Santa Cruz Attachment E Jurisdictional Aquatic Resources Delineation (May 2020)
Attachment F Geotechnical Investigation (September 2020) and Approval Letter from County of Santa Cruz
Attachment G Hydrologic and Hydraulic Analyses (April 2020)
Attachment H Culvert Hydraulic Analysis (December 2020)
Attachment I Approval Letter from County of Santa Cruz for Phase 1 Archaeological Investigation (September 2020)

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Attachment A

Required Mitigation Measures

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No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
Biological Resources				
BIO-1	**CRLF Protection Measures during Construction.** During project construction activities, the City shall ensure the following avoidance measures and biological monitoring will be implemented to protect the California red-legged frog (CRLF) and other sensitive wildlife species: a. Prior to initiation of construction activities, a USFWS- and CDFW-approved biologist shall prepare a construction monitoring plan that identifies all areas to be protected with exclusion fencing on a 1:1500 scale map (or similar scale determined to be practicable), and all areas requiring monitoring by a USFWS- and CDFW-approved biologist. b. Prior to initiation of construction activities, the agency-approved biologist shall conduct an environmental training for all construction personnel. The training shall include a description of CRLF and its habitat, and measures to protect CRLF, and other sensitive wildlife species known or with potential to occur (WPT, nesting avian species, San Francisco dusky-footed woodrat, and roosting bats) in the Project alignments and surroundings. c. Prior to initiation of construction activities, the construction contractor shall install exclusion fencing (solid silt fencing) in specified areas along the project boundaries, 2.0 feet below grade and 3.0 feet above grade, with wooden stakes at intervals of not more than 5.0 feet. The fence shall be maintained in working order for the duration of construction activities. The agency-approved biologist or designated trained construction monitor shall inspect the fence daily and notify the construction foreman when fence maintenance is required. The fence shall allow for wildlife passage across the Project Area at intervals to be determined in conjunction with USFWS and CDFW. d. If feasible, construction activities within and adjacent to the CDFW Reserve, Struve Slough, and Watsonville Slough shall take place during the dry season and before the first rain of the season, especially vegetation removal and work in or near Struve Slough. Avoid working at night or during rain events when special-status amphibians and mammals are generally more active. Consult weather forecasts from the National Weather Service at least 72 hours prior to performing work. e. During vegetation removal in or adjacent to the CDFW Reserve and construction within or adjacent to Struve Slough and Watsonville Slough, with the authorization of the USFWS and CDFW, the agency-approved biological monitor will be present (or on call) to relocate CRLF (and WPT) as needed. The approved biologist shall have the authority to stop work that may result in the “take” of a special-status species. The biologist will thoroughly check all vegetation for CRLF, WPT, and other wildlife species prior to vegetation removal activities. f. The approved biologist or construction monitor will check under all equipment for wildlife before use. If any special-status wildlife is observed under equipment or within the work	City with construction supervisor and agency-approved biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to and during construction activities

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	area, the approved biologist will be permitted to handle and relocate it. g. At the end of each work day, excavations shall be secured with a cover, or a ramp installed to prevent wildlife entrapment. h. All trenches, pipes, culverts or similar structures shall be inspected for animals prior to burying, capping, moving, or filling.			
BIO-2	**Conceptual Mitigation Plan for California Red Legged Frog and Other Sensitive Resources.** To minimize take of CRLF and degradation of its habitat during trail operation, the City will retain an agency-approved biologist to develop a Conceptual Mitigation Plan (CMP) for CRLF and other sensitive resources. The details of the CMP will be developed in consultation with USFWS and CDFW, with input from collaborative partners Watsonville Wetlands Watch and, if determined to be appropriate and beneficial, the Land Trust of Santa Cruz County. The CMP will include the following components: a. Identification and mapping of occupied and potential CRLF aquatic (breeding and non-breeding), upland, refuge, movement, and dispersal habitat within and adjacent to the CDFW Reserve, proposed Struve Slough Bridge crossing, and channelized Watsonville Slough. b. Strategies to protect these areas from take of individual CRLF or degradation associated with trail operation. c. Monitoring of CRLF habitat (at a frequency to be determined in consultation with the agencies) by an agency-approved biologist to ensure degradation of habitat is not occurring. The monitor will confirm that protective maintenance measures are being implemented, including restricting mowing and pruning to the dry season (typically from April 15 to October 15). d. Adaptive management strategies to modify and/or supplement existing mitigation measures, in the event that the monitoring biologist identifies degradation of CRLF habitat. e. Humane removal of non-native predators in off-channel ponds or other potential breeding ponds lacking direct connection to the larger slough system. f. Communication protocol for local law enforcement and public works representatives to enforce parking restrictions along Lee Road and immediately alert Watsonville Wetlands Watch, CDFW Reserve Representatives, and/or the assigned monitoring biologist in the event that illegal encampments or other degradation of CRLF habitat is observed. For efficiency, this CMP for CRLF protection could be integrated with the CMP developed to mitigate impacts to sensitive habitats and displaced wetlands (described in Mitigation Measures BIO-7 and BIO-10, respectively), such as creation or enhancement of off-channel breeding habitat within the CDFW Reserve or on Watsonville Slough Farm, and planting of adjacent refuge habitat with native vegetation.	City with agency-approved biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to, during and after construction activities

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
BIO-3	**Nesting Bird Protection Measures.** To protect nesting birds, the City in coordination with the construction contractor and a qualified biologist, will implement the following avian protection measures prior to and during construction: a. The avian breeding season occurs between February 1 and September 1. If feasible, perform vegetation removal activities within or near the CDFW Reserve and along Watsonville Slough outside of breeding bird season to avoid direct harm or mortality to potential nesting bird species and other sensitive biological resources. b. For all project activities initiated during the breeding bird season, or if construction activities lapse for a period of two weeks or more during breeding bird season, a qualified biologist will conduct a breeding bird survey for nesting birds, including raptors. Surveys will be conducted within 15 days prior to beginning project activities and will include all work, staging, and access areas and a minimum buffer radius of 400 meters (or more as determined by the resource agencies). The survey will include potential habitat for sensitive and common raptors and other nesting avian species known to occur within the Study Area (grassland, coastal scrub, arroyo willow riparian, freshwater marsh, non-native forest/eucalyptus grove). c. If no nesting sensitive or common avian species are observed during breeding bird surveys no additional measures will be required. d. If common nesting birds are observed within or adjacent to (within 90 meters or 300 feet) vegetation proposed for removal, vegetation removal activities will be postponed until young have fledged to avoid direct harm or mortality of nesting birds and/or establish buffers depending on the activity and appropriate to the species, as determined by the qualified biologist. e. Sensitive bird species, if nesting in or near the Project Area, will be given special consideration and may require additional protective measures as determined through consultation with the relevant agency (USFWS or CDFW), such as protective buffers: • bald eagle: 400 meters (1,300 feet) • northern harrier, white-tailed kite, and other raptors: 90 meters (300 feet) • lawrence’s goldfinch, grasshopper sparrow: 25 meters (75 feet) • oak titmouse: 15 meters (50 feet) f. Destruction of fossorial mammal burrows will be avoided to the greatest extent feasible. g. If any work is performed within or adjacent to the CFDW Reserve, Struve Slough, or Watsonville Slough during the burrowing owl and tricolored blackbird wintering period (from November to March), a qualified burrowing owl biologist will conduct a survey for these species and include the project area and suitable habitat within 150 meters (490 feet). A qualified burrowing owl biologist will have: 1) familiarity with the species and its local ecology; 2) experience conducing habitat assessments and non-breeding and breeding season surveys, or experience with these surveys conducted under the direction of an experienced surveyor; 3) familiarity with the appropriate state and federal statutes related to burrowing owls, scientific research, and conservation; and 4) experience with analyzing impacts of development on burrowing owls and their habitat. If burrowing owls are detected: • place visible markers near occupied burrows and fence off suitable habitat • avoid direct destruction of burrows, and • include the burrowing owl in the environmental training for construction personnel.	City with construction supervisor and qualified biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to and during construction activities

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
BIO-4	**San Francisco Dusky-Footed Woodrat Protection Measures.** To protect San Francisco dusky-footed woodrat, the City in coordination with the construction contractor and a qualified biologist, will implement the following protection measures prior to and during construction: a. Prior to construction, a qualified biologist shall conduct a preconstruction survey for woodrat houses, and clearly flag all houses within the construction impact area and immediate surroundings. b. The construction contractor shall avoid woodrat houses to the extent feasible by installing a minimum 10-foot (preferably 25-foot) buffer with silt fencing or other material that shall prohibit encroachment. If this buffer and avoidance is not feasible, the qualified biologist shall allow encroachment into the buffer, but retain microhabitat conditions such as shade, cover and adjacent food sources. c. If avoidance of woodrat houses is not possible, in coordination with CDFW, a qualified biologist shall develop and implement a San Francisco Dusky-footed Woodrat Relocation Plan (an example is provided in Appendix F of the Biotic Report, which is Attachment D of the IS/MND).	City with construction supervisor and qualified biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to and during construction activities
BIO-5	**Roosting Bat Protection Measures.** To protect roosting bats, the City, in coordination with the construction contractor and a qualified biologist, will implement the following protection measures to protect maternity roosts, individual roosts and winter hibernacula prior to and during construction: a. If feasible, conduct limbing/tree removal operations between September 15 and November 1 to avoid bat maternity roosts and winter hibernacula, as well as other sensitive biological resources. b. During all months, prior to limbing/tree removal, a qualified biologist shall conduct a pre-construction survey for bats to determine if crevice or foliage roosting bats are present, as follows: • a qualified biologist shall determine if bats are utilizing the site for roosting. For any trees/snags that could provide roosting space for cavity or foliage-roosting bats, potential bat roost features shall be thoroughly evaluated to determine if bats are present. Visual inspection and/or acoustic surveys shall be utilized as initial techniques. If roosting bats are found, the biologist shall develop and implement acceptable passive exclusion methods in coordination with or based on CDFW recommendations. If feasible, exclusion shall take place during the appropriate windows (between September 1 and November 1) to avoid harming bat maternity roosts and/or winter hibernacula. (Authorization from CDFW is required to evict winter hibernacula for bats). • if established maternity colonies are found, in coordination with CDFW, a buffer shall be established around the colony to protect pre-volant young from construction disturbances until the young can fly; or implement other measures acceptable to CDFW. • if a tree is determined not to be an active roost site for roosting bats, it may be immediately limbed or removed as follows: If foliage roosting bats are determined to be present, limbs shall be lowered, inspected for bats by a bat biologist, and chipped immediately or moved to a dump site. Alternately, limbs may be lowered	City with construction supervisor and qualified biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to and during construction activities

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	and left on the ground until the following day, when they can be chipped or moved to a dump site. No logs or tree sections shall be dropped on downed limbs or limb piles that have not been in place since the previous day. • if the tree is not limbed or removed within four days of the survey, the survey efforts shall be repeated.			
BIO-6	**Sensitive Habitat Protection Measures during Construction**. To protect sensitive habitat, the City in coordination with the construction contractor and a qualified biologist, will implement the following protection measures prior to and during construction: a. Minimize the construction footprint, including removal or disturbance of existing vegetation, as feasible. b. Stage equipment in ruderal and developed areas only. c. Confine project activities and operation of equipment and vehicles, including site access and parking, to designated staging areas to the greatest extent feasible. d. Within the CDFW Reserve, access the trail alignment from the Lee Road side to the greatest extent feasible. e. Fence off coastal scrub and other sensitive habitats to prevent encroachment, and protect edge habitats wherever feasible. f. Avoid grubbing and construction within 100 feet of the edge of sensitive habitats, where feasible. g. Restrict and minimize access roads into Struve Slough to the greatest extent feasible. h. Clean all equipment caked with mud, soils, or debris from offsite sources or previous project sites prior to staging equipment on site to avoid introducing or spreading invasive exotic plant species into the adjacent remaining habitats. All equipment used on the premises should be cleaned prior to leaving the site for future projects. i. Revegetate coastal scrub and arroyo willow riparian forest that is temporary or permanently removed, so there is no net loss, with locally-sourced native plantings. Adjacent non-native grassland and ruderal habitats may also be planted with native vegetation, preserving edge effects, where appropriate. j. Upon project completion, areas remaining outside the project footprint will be planted with a planting palate of suitable native species. This will include using a native seed mix and container plants where appropriate. The native seed mix will be developed in coordination with Watsonville Wetlands Watch and CDFW to ensure proper species selection and application rates. Sterile barley or wheat may be used as erosion control in the first year following disturbance but the seed must have a minimum purity of 95 percent and 85 percent germination rate. A preliminary seed mix recommended for revegetation is included in Appendix H of the Biotic Report, which is Attachment D of the IS/MND. k. In areas within, outside and adjacent to the project footprint, remove invasive species, particularly those designated by Cal-IPC as having moderate to high potential for "severe ecological impacts on physical processes, plant and animal communities, and vegetation structure". l. Where temporary impacts to sensitive habitats (e.g., coastal scrub or arroyo willow riparian forest) occur, re-vegetate as needed with locally-sourced native plantings. Adjacent non-native grassland and ruderal habitats may also be planted with native vegetation, preserving edge effects, where appropriate.	City with construction supervisor and qualified biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to and during construction activities

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
BIO-7	**Conceptual Mitigation Plan for Sensitive Habitat.** To compensate for the loss of the non-native grassland buffer, and to minimize degradation of sensitive habitats during trail operation, the City will retain a qualified biologist to develop a Conceptual Habitat Mitigation Plan (CMP). The details of the CMP will be developed in consultation with CDFW, Watsonville Wetlands Watch and, if determined to be appropriate and beneficial, the Land Trust of Santa Cruz County. The CMP will include the following components: a. Strategies to protect sensitive habitat from degradation associated with trail operation and to enhance core areas to improve habitat values. b. Monitoring of sensitive habitat (at a frequency to be determined in consultation with the agencies) by a qualified biologist to ensure degradation is not occurring and invasive weeds are eradicated to prevent further encroachment into sensitive habitat areas. Adaptive management strategies to modify and/or supplement existing mitigation measures, in the event that the monitoring biologist identifies degradation of sensitive habitat. c. Communication protocol for local law enforcement and public works representatives to immediately alert Watsonville Wetlands Watch, CDFW Reserve Representatives, and/or the assigned monitoring biologist in the event that illegal encampments or other degradation of sensitive habitats are observed. For efficiency, this CMP for sensitive habitat protection could be integrated with the CMP developed to mitigate impacts to CRLF habitat and displaced wetlands (described in Mitigation Measures BIO-2 and BIO-10, respectively), such as the creation or enhancement of sensitive habitats within the CDFW Reserve or on Watsonville Slough Farm.	City with qualified biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to, during and after construction activities
BIO-8	**Wetlands Protection Measures during Construction**. The City, in coordination with the construction contractor and qualified biologist, will implement the following wetlands protection measures during construction near Struve Slough: a. Avoid or minimize disturbance to palustrine emergent wetlands (seasonal wetland, seep, and freshwater marsh), and aquatic habitats by having a qualified biologist identify fencing limits for the work, staging, and access areas; and restrict all activity to within this footprint. b. Where feasible, avoid grubbing and construction within 100 feet of the edge of wetlands and other waters per the County's Sensitive Habitat Protection and Riparian Corridor and Wetlands Protection ordinances (SCCC 16.30 and 16.32). Restrict access roads into Struve Slough and minimize access roads to the greatest extent feasible.	City with construction supervisor and qualified biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to and during construction activities
BIO-9	**Wetland Replacement.** The City in coordination with a qualified biologist will replace and/or enhance displaced wetlands (seasonal wetland and freshwater marsh) at a ratio to be determined in consultation with regulatory agencies. Typical mitigation ratios vary between 2:1 and 4:1 depending on the quality of the displaced habitat. The size and location of the wetland would be developed in the Conceptual Mitigation Plan (refer to Mitigation Measure BIO-11). On site mitigation (i.e., within the CDFW Reserve and along channelized Watsonville Slough) would be the	City with qualified biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and	Within one year of completion of construction

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	preferred location for the mitigation wetland(s). The Land Trust of Santa Cruz County also proposed Watsonville Slough Farm (located adjacent to the CDFW Reserve on the west side of Lee Road) as an alternate wetland mitigation site. A memo developed by Watsonville Wetlands Watch, identifying potential mitigation sites is included in Appendix H of the Biotic Report, which is Attachment D of the IS/MND. This memo outlines several viable areas for wetland creation and enhancement, including with the CDFW Reserve. Site reconnaissance and advanced planning for these locations indicate these area would meet the objectives for long-term benefits to wetland resources and wildlife within the Watsonville Sloughs system.		Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	
BIO-10	**Conceptual Mitigation Plan for Wetlands Habitat.** The City will retain a qualified biologist to develop a conceptual mitigation plan (CMP) for wetlands habitat. The details of the CMP will be developed in consultation with USFWS, CDFW, Regional Water Quality Control Board, and Watsonville Wetlands Watch and include the following components: a. Description of the Lee Road Trail Project including acreage of temporary and permanent impacts to palustrine emergent wetland, arroyo willow riparian, freshwater marsh, and aquatic habitat (Struve Slough and Watsonville Slough), as identified in the formal delineation of jurisdictional wetlands and other Waters of the U.S. b. Goals of compensatory mitigation project including types and areas of wetland and aquatic habitat to be created, restored, and/or enhanced, and mitigation ratios (created/restored/enhanced : impacted). c. Location and acreage of wetland and riparian mitigation areas including size and ownership status (refer to Appendix H of the Biotic Report, which is Attachment D of the IS/MND). d. Detailed construction and planting techniques. e. Replacement in kind of fresh water marsh vegetation that is temporarily or permanently lost. Replacement vegetation for temporary loss will occur by natural recruitment (which occurs if roots remain near freshwater marsh) or, where necessary, by replacement planting. Replacement vegetation for permanent loss will occur through replacement or enhancement. f. Replacement of all non-native tree and shrub vegetation with native, locally-sourced vegetation. The non-native tree to be removed for trail construction (at southern Struve Slough Bridge approach) will be replaced with native trees. Any permanent disturbance to coastal scrub or riparian habitat will be mitigated through in kind replacement and/or enhancement. g. Description and design of habitat requirements for special-status wildlife, including CRLF, occupying wetland and aquatic habitats. h. Maintenance activities during the monitoring period, including replanting native wetland and riparian vegetation and weed removal, that will not result in take of CRLF. i. Strategies for protecting the habitat values of the CDFW Reserve, Struve Slough, and Watsonville Slough, including wildlife movement. j. Long-term quantitative and qualitative monitoring and reporting, documenting ability to meet or surpass performance criteria. k. Adaptive management strategies to ensure long-term viability of mitigation areas. For efficiency, this CMP for displaced wetlands could be integrated with the CMP developed to	City with qualified biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to, during and after construction activities

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	mitigate impacts to CRLF and sensitive habitats (described in Mitigation Measures BIO-2 and BIO-7, respectively).			
BIO-11	**Replacement Tree(s) and Native Vegetation for Significant Tree Removal.** The City will ensure the following measures are implemented: a. The southern Struve Slough Bridge approach will be revegetated with native vegetation suitable to the location such as: blue elderberry (Sambucus nigrum), coffeeberry (Frangula californica), Indianhemp dogbane (Apocynum cannabinum), California blackberry (Rubus ursinus), and wild rose (Rosa californica). Although these species are not tree species, this palette is more suitable than trees to the natural landscape in this location. b. To fulfill the condition of approval to replace Significant Trees within the County Coastal Zone, and to mitigate for impacts elsewhere along the trail, Native tree(s) will be planted as a component of Mitigation BIO-7: Conceptual Mitigation Plan for Sensitive Habitat (#2 above). The mitigation location for tree replacement and selection of tree species will be determined by a qualified biologist in conjunction with the County, CDFW, and Watsonville Wetlands Watch. Native tree(s) suitable to the proposed mitigation location for mitigation and the planting plan will be approved at replacement ratio determined by the County prior to implementation.	City with qualified biologist	Compliance monitored by qualified agency-approved biologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Within one year of completion of construction
Cultural Resources				
CR-1	**Conditions of Approval to Minimize Impacts to Cultural Resources and Tribal Cultural Resources.** Prior to and during construction, the City of Watsonville will implement the following measures: a. Prior to any site disturbance, a pre-construction meeting shall be conducted. The purpose of the meeting will be to ensure that the conditions set forth in the proposed project description and permit requirements are communicated to the various parties responsible for constructing the project. The meeting shall involve all relevant parties including the project proponent, construction supervisor, the project Archaeologist, and the Native American Monitor. b. A California trained Archaeologist and qualified trained Native American Monitor shall be on site during all ground-disturbing activities in the vicinity of CA-SCR-107 and any other areas where monitoring is determined necessary through Native American Consultation and pre-construction testing. Both monitors shall have the authority to stop construction to implement the Archaeological Treatment Plan if necessary. c. A Construction Monitoring Plan for Cultural Resources and Human Remains shall be prepared by a qualified Archaeologist. This formal monitoring plan shall be intended to provide a detailed outline for targeted archaeological monitoring of construction in the project area. The monitoring plan shall be a standalone document prepared in conjunction with the Archaeological Treatment Plan. d. In consultation with Native American Tribes and the County, an Archaeological Treatment Plan shall be prepared by a qualified archaeologist for implementation during all ground disturbance associated with the project (including archaeological testing activities). The Archaeological Treatment Plan shall outline the treatment of archaeological resources encountered during ground disturbance and shall include the following at minimum:	City with construction supervisor, project archaeologist, and Native American monitor.	Compliance monitored by qualified archaeologist with oversight by the City and Construction supervisor or qualified consultant representative assigned to overall construction monitoring.	Prior to and during construction activities

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance

	• Background information that summarizes the sensitivity of the project area for archaeological resources and significant Native American Cultural Sites.
	• Description of the specific locations and methods of pre-construction archaeological testing activities for the two different construction phases as outlined below:
	  ○ Testing shall be undertaken to the maximum depth of planned project impacts with a Native American monitor present at all times.
	  ○ The goal of this testing shall be to determine if intact archaeological deposits or ancestral human remains survive in these locations, assess the nature of these deposits, and recommend any additional protective measures to be implemented.
	  ○ Archaeological testing for Phase 1 on the north side of Struve Slough shall be comprised of clearing/mowing of vegetation along the trail alignment, additional surface surveys to identify any necessary testing locations, and excavation of a series of shovel probes to be determined in coordination with a Native American representative.
	  ○ Archaeological testing for Phase 2 on the south side of Struve Slough shall be undertaken on both sides of Lee Road, using hand and/or mechanical excavation methods, in locations determined in coordination with a Native American representative. Specific care and instructions should be directed to where the previously recorded Costanoan-Ohlone Cemetery Site (CA-SCR-107) intersects with proposed ground disturbing project activities.
	• Avoidance and preservation in place is the preferred method of treatment. Archaeological resources shall be avoided and preserved in place as much as feasible. Reasonable efforts shall be made to preserve archaeological resources in place or leave in an undisturbed state.
	• Describe the methods for identification, evaluation, and treatment of any discoveries (e.g., leave in place and cap based on Native American recommendations).
	• Outline the notification procedures given in SCCC Chapter 16.40 for discovery of archaeological resources and human remains.
	• If disturbance is unavoidable, the preferred method of treatment would be to record any data necessary to adequately document the scientifically consequential information from and about the disturbed historical resource, and then return all artifacts as close to their original location as possible before capping or covering with soil.
	e. All construction personnel working on the project shall receive cultural sensitivity training conducted by a California trained Archaeological monitor and qualified trained Native American Monitor. Cultural sensitivity training shall occur before a person is authorized to work at the project site.
	f. Pursuant to section 16.40.040 of the SCCC, if archaeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the following notification procedures given in SCCC Chapter 16.40.
	• Pursuant to section 16.40.040 of the SCCC, and California Health and Safety Code sections 7050.5-7054, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible			

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	persons will immediately cease and desist from all further site excavation and notify the Sheriff-Coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archaeological report will be prepared, and representatives of local Native American Indian groups shall be contacted. If it is determined that the remains are Native American, the Native American Heritage Commission will be notified as required by law. The Commission will designate a Most Likely Descendant who will be authorized to provide recommendations for management of the Native American human remains. Pursuant to Public Resources Code section 5097, the descendants will complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. Disturbance will not resume until the significance of the resource is determined and appropriate mitigations to preserve the resource on the site are established.			

A.2 Mitigation Measures Required for Each Section of the Watsonville Lee Road Trail Project by

Mitigation Measure	Lee Road North	Struve Slough Bridge	Lee Road Middle	Watsonville Slough	Lee Road South[1]
	Phase 1	Phase 2	Phase 2	Phase 2	Phase 3
BIO-1: CRLF Protection Measures during Construction	X	X	X	X	X
BIO-2: Conceptual Mitigation Plan for California Red Legged Frog and Other Sensitive Resources	X	X	X	X	X
BIO-3: Nesting Bird Protection Measures	X	X	X	X	X
BIO-4: San Francisco Dusky-Footed Woodrat Protection Measures	X	X	X	X	X
BIO-5: Roosting Bat Protection Measures	X	X	X	X	X
BIO-6: Sensitive Habitat Protection Measures during Construction	X	X	X	X	X
BIO-7: Conceptual Mitigation Plan for Sensitive Habitat	X	X	X	X	X
BIO-8: Wetlands Protection Measures during Construction	X	X		X	X
BIO-9: Wetland Replacement	X	X		X	X
BIO-10: Conceptual Mitigation Plan for Wetlands Habitat	X	X		X	X
BIO-11: Replacement and Native Vegetation for Significant Tree Removal[2]		X	X		
CR-1: Conditions of Approval to Minimize Impacts to Cultural Resources and Tribal Cultural Resources	X	X	X	X	X

[1] The Watsonville Slough culvert (under Lee Road) replacement is part of the Lee Road South section.
[2]This mitigation is for removal of the existing 72-inch DBH eucalyptus tree, which is on the border of the Struve Slough Bridge and Lee Road Middle sections

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Attachment B

Representative Photographs of the Project Area

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Source: County of Santa Cruz Imagery 2016.

Harris & Associates

N

0 400 800
Feet

Attachment B

Photo Locations

1. Lee Road North section: Photo of Harkins Slough Road, taken at the PVHS driveway (facing west).

2. Lee Road North section: Photo of Lee Road, taken from the Harkins Slough Road intersection (facing south).

3. Lee Road North section: Photo of Lee Road, taken at the driveway to the Land Trust of Santa Cruz property (facing south).

4. Lee Road North section: Photo of Lee Road, taken at the driveway to the Land Trust of Santa Cruz property (facing north).

Path: C:\Users\Randy.Deodat\Desktop\Projects_Clone\Fanita\Map Docs\EIR\Project_Description

Harris & Associates

5. Lee Road North section: Photo of Lee Road, taken north of the Fitz property driveway (facing south).

6. Lee Road North section: Photo of Lee Road and Struve Slough, taken south of the gate (facing south).

Path: C:\Users\Randy.Deodat\Desktop\Projects_Clone\Fanita\Map Docs\EIR\Project_Description

7. Lee Road North section: Photo of Struve Slough and Highway 1 in the background, taken from Lee Road (facing east).

8. Lee Road Middle section: Photo of Lee Road, taken south of the gate (facing south).

9. Watsonville Slough section: Photo of existing unpaved Watsonville Slough Trail (facing east).

10. Lee Road South section: Photo of Lee Road, taken on the north side of the Watsonville Slough drainage crossing (facing south).

11. Lee Road South section: Photo of Watsonville Slough culvert under Lee Road (facing southwest).

12. Lee Road South section: Photo of Lee Road, taken from the railroad tracks (facing north).

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Attachment C

Air Quality Model Output
(April 2020)

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Lee Road Trail

North Central Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	1.17	Acre	1.17	50,965.20	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Phase 1 is six months

Off-road Equipment - Applicant provided fleet

Grading - Disturbance area provided

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	4.00	120.00
tblConstructionPhase	PhaseEndDate	6/7/2021	10/15/2021
tblConstructionPhase	PhaseStartDate	6/2/2021	5/2/2021
tblGrading	AcresOfGrading	0.00	2.17
tblGrading	MaterialExported	0.00	1,490.00
tblGrading	MaterialImported	0.00	1,925.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1509	1.5234	0.9908	1.8800e-003	0.5649	0.0750	0.6399	0.3039	0.0691	0.3729	0.0000	165.5297	165.5297	0.0445	0.0000	166.6409
Maximum	**0.1509**	**1.5234**	**0.9908**	**1.8800e-003**	**0.5649**	**0.0750**	**0.6399**	**0.3039**	**0.0691**	**0.3729**	**0.0000**	**165.5297**	**165.5297**	**0.0445**	**0.0000**	**166.6409**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1509	1.5234	0.9908	1.8800e-003	0.2662	0.0750	0.3411	0.1399	0.0691	0.2090	0.0000	165.5296	165.5296	0.0445	0.0000	166.6407
Maximum	**0.1509**	**1.5234**	**0.9908**	**1.8800e-003**	**0.2662**	**0.0750**	**0.3411**	**0.1399**	**0.0691**	**0.2090**	**0.0000**	**165.5296**	**165.5296**	**0.0445**	**0.0000**	**166.6407**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**52.88**	**0.00**	**46.69**	**53.95**	**0.00**	**43.96**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	5-3-2021	8-2-2021	0.9159	0.9159
2	8-3-2021	9-30-2021	0.5874	0.5874
		Highest	0.9159	0.9159

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.3600e-003	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.3600e-003**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.3600e-003	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.3600e-003**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	5/2/2021	10/15/2021	5	120	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2.17

Acres of Paving: 1.17

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Skid Steer Loaders	2	6.00	65	0.37
Grading	Rollers	2	6.00	80	0.38
Grading	Plate Compactors	2	6.00	8	0.43
Grading	Rubber Tired Dozers	2	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Grading	Graders	0	6.00	187	0.41

<u>Trips and VMT</u>

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	10	25.00	0.00	338.00	17.10	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5431	0.0000	0.5431	0.2980	0.0000	0.2980	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1411	1.4700	0.9114	1.5600e-003		0.0747	0.0747		0.0688	0.0688	0.0000	135.7904	135.7904	0.0433	0.0000	136.8729
Total	**0.1411**	**1.4700**	**0.9114**	**1.5600e-003**	**0.5431**	**0.0747**	**0.6178**	**0.2980**	**0.0688**	**0.3668**	**0.0000**	**135.7904**	**135.7904**	**0.0433**	**0.0000**	**136.8729**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.3100e-003	0.0454	8.2900e-003	1.3000e-004	2.8700e-003	1.7000e-004	3.0400e-003	7.9000e-004	1.6000e-004	9.5000e-004	0.0000	12.9223	12.9223	5.2000e-004	0.0000	12.9353
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.5700e-003	7.9800e-003	0.0712	1.9000e-004	0.0189	1.5000e-004	0.0190	5.0200e-003	1.4000e-004	5.1600e-003	0.0000	16.8171	16.8171	6.3000e-004	0.0000	16.8327
Total	**9.8800e-003**	**0.0534**	**0.0795**	**3.2000e-004**	**0.0218**	**3.2000e-004**	**0.0221**	**5.8100e-003**	**3.0000e-004**	**6.1100e-003**	**0.0000**	**29.7393**	**29.7393**	**1.1500e-003**	**0.0000**	**29.7680**

3.2 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2444	0.0000	0.2444	0.1341	0.0000	0.1341	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1411	1.4700	0.9114	1.5600e-003		0.0747	0.0747		0.0688	0.0688	0.0000	135.7902	135.7902	0.0433	0.0000	136.8727
Total	**0.1411**	**1.4700**	**0.9114**	**1.5600e-003**	**0.2444**	**0.0747**	**0.3191**	**0.1341**	**0.0688**	**0.2029**	**0.0000**	**135.7902**	**135.7902**	**0.0433**	**0.0000**	**136.8727**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.3100e-003	0.0454	8.2900e-003	1.3000e-004	2.8700e-003	1.7000e-004	3.0400e-003	7.9000e-004	1.6000e-004	9.5000e-004	0.0000	12.9223	12.9223	5.2000e-004	0.0000	12.9353
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.5700e-003	7.9800e-003	0.0712	1.9000e-004	0.0189	1.5000e-004	0.0190	5.0200e-003	1.4000e-004	5.1600e-003	0.0000	16.8171	16.8171	6.3000e-004	0.0000	16.8327
Total	**9.8800e-003**	**0.0534**	**0.0795**	**3.2000e-004**	**0.0218**	**3.2000e-004**	**0.0221**	**5.8100e-003**	**3.0000e-004**	**6.1100e-003**	**0.0000**	**29.7393**	**29.7393**	**1.1500e-003**	**0.0000**	**29.7680**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	4.3600e-003	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	4.3600e-003	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**4.3500e-003**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**4.3500e-003**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lee Road Trail

North Central Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	1.17	Acre	1.17	50,965.20	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Phase 1 is six months

Off-road Equipment - Applicant provided fleet

Grading - Disturbance area provided

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	4.00	120.00
tblConstructionPhase	PhaseEndDate	6/7/2021	10/15/2021
tblConstructionPhase	PhaseStartDate	6/2/2021	5/2/2021
tblGrading	AcresOfGrading	0.00	2.17
tblGrading	MaterialExported	0.00	1,490.00
tblGrading	MaterialImported	0.00	1,925.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.5327	25.4039	16.5570	0.0313	9.4266	1.2496	10.6761	5.0671	1.1509	6.2180	0.0000	3,036.6090	3,036.6090	0.8171	0.0000	3,057.0357
Maximum	**2.5327**	**25.4039**	**16.5570**	**0.0313**	**9.4266**	**1.2496**	**10.6761**	**5.0671**	**1.1509**	**6.2180**	**0.0000**	**3,036.6090**	**3,036.6090**	**0.8171**	**0.0000**	**3,057.0357**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.5327	25.4039	16.5570	0.0313	4.4478	1.2496	5.6974	2.3350	1.1509	3.4859	0.0000	3,036.6090	3,036.6090	0.8171	0.0000	3,057.0357
Maximum	**2.5327**	**25.4039**	**16.5570**	**0.0313**	**4.4478**	**1.2496**	**5.6974**	**2.3350**	**1.1509**	**3.4859**	**0.0000**	**3,036.6090**	**3,036.6090**	**0.8171**	**0.0000**	**3,057.0357**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**52.82**	**0.00**	**46.63**	**53.92**	**0.00**	**43.94**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0239	0.0000	1.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.6000e-004	2.6000e-004	0.0000		2.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0239**	**0.0000**	**1.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0239	0.0000	1.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.6000e-004	2.6000e-004	0.0000		2.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0239**	**0.0000**	**1.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	5/2/2021	10/15/2021	5	120	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2.17

Acres of Paving: 1.17

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Skid Steer Loaders	2	6.00	65	0.37
Grading	Rollers	2	6.00	80	0.38
Grading	Plate Compactors	2	6.00	8	0.43
Grading	Rubber Tired Dozers	2	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Grading	Graders	0	6.00	187	0.41

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	10	25.00	0.00	338.00	17.10	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0523	0.0000	9.0523	4.9674	0.0000	4.9674			0.0000			0.0000
Off-Road	2.3509	24.5006	15.1893	0.0259		1.2442	1.2442		1.1458	1.1458		2,494.7217	2,494.7217	0.7955		2,514.6088
Total	**2.3509**	**24.5006**	**15.1893**	**0.0259**	**9.0523**	**1.2442**	**10.2965**	**4.9674**	**1.1458**	**6.1132**		**2,494.7217**	**2,494.7217**	**0.7955**		**2,514.6088**

3.2 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0224	0.7570	0.1465	2.2200e-003	0.0492	2.8700e-003	0.0521	0.0135	2.7400e-003	0.0162		234.3831	234.3831	0.0101		234.6353
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1595	0.1463	1.2213	3.0900e-003	0.3250	2.5300e-003	0.3276	0.0862	2.3300e-003	0.0885		307.5043	307.5043	0.0115		307.7916
Total	**0.1818**	**0.9032**	**1.3678**	**5.3100e-003**	**0.3743**	**5.4000e-003**	**0.3797**	**0.0997**	**5.0700e-003**	**0.1048**		**541.8874**	**541.8874**	**0.0216**		**542.4269**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0735	0.0000	4.0735	2.2353	0.0000	2.2353			0.0000			0.0000
Off-Road	2.3509	24.5006	15.1893	0.0259		1.2442	1.2442		1.1458	1.1458	0.0000	2,494.7217	2,494.7217	0.7955		2,514.6088
Total	**2.3509**	**24.5006**	**15.1893**	**0.0259**	**4.0735**	**1.2442**	**5.3177**	**2.2353**	**1.1458**	**3.3811**	**0.0000**	**2,494.7217**	**2,494.7217**	**0.7955**		**2,514.6088**

3.2 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0224	0.7570	0.1465	2.2200e-003	0.0492	2.8700e-003	0.0521	0.0135	2.7400e-003	0.0162		234.3831	234.3831	0.0101		234.6353
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1595	0.1463	1.2213	3.0900e-003	0.3250	2.5300e-003	0.3276	0.0862	2.3300e-003	0.0885		307.5043	307.5043	0.0115		307.7916
Total	**0.1818**	**0.9032**	**1.3678**	**5.3100e-003**	**0.3743**	**5.4000e-003**	**0.3797**	**0.0997**	**5.0700e-003**	**0.1048**		**541.8874**	**541.8874**	**0.0216**		**542.4269**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0239	0.0000	1.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.6000e-004	2.6000e-004	0.0000		2.7000e-004
Unmitigated	0.0239	0.0000	1.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.6000e-004	2.6000e-004	0.0000		2.7000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.8200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0181					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.6000e-004	2.6000e-004	0.0000		2.7000e-004
Total	**0.0239**	**0.0000**	**1.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.6000e-004**	**2.6000e-004**	**0.0000**		**2.7000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.8200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0181					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.6000e-004	2.6000e-004	0.0000		2.7000e-004
Total	**0.0239**	**0.0000**	**1.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.6000e-004**	**2.6000e-004**	**0.0000**		**2.7000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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Attachment D

Approval Letter from
County of Santa Cruz

and

Biotic Assessment (October 2020)

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County of Santa Cruz

PLANNING DEPARTMENT
701 Ocean Street, 4th floor, Santa Cruz, Ca 95060
(831) 454-2580 Fax: (831) 454-2131 Tdd: (831) 454-2123
Kathleen Molloy, Planning director

November 5, 2020

Kate Giberson
Harris & Associates
450 Lincoln Avenue, Suite 103
Salinas, CA 93901
Kate.Giberson@weareharris.com

Subject: Lee Road Trail Project Biotic Report Review and Conditioned Biotic Approval
APN: Road Rights of Way Santa Cruz County and City of Watsonville; APN 052-091-41
Application #s: REV201053; 201188

Attachment 1. Biotic Assessment
Attachment 2. Aquatic Resources Delineation

Dear Ms. Giberson,

The Planning Department received and reviewed a Biotic Assessment Report, dated October 10, 2020, and an Aquatic Resources Delineation Report, dated May 2020, prepared by Ecosystems West Consulting Group (Ecosystems West) for the Lee Road Trail Project. Copies of the reports are included as Attachments 1 and 2. The Biotic Report Review was required because of the potential for sensitive habitats and protected species in the disturbance area for this project where grading, installation of a concrete path, construction of a bridge, and other development activities are proposed. Portions of the proposed project are located within the jurisdiction of the City of Watsonville, and the remainder of the project is in unincorporated Santa Cruz County within the Coastal Zone.

Project Description

The proposed project involves creation of 1.4-miles of pedestrian/bicycle access along Harkins Slough Road and Lee Road between Pajaro Valley High School and the City of Watsonville's existing and proposed trail systems to the south including the Land Trust of Santa Cruz County's Watsonville Slough Farm west of Lee Road, the Manabe-Ow Trail and Lower Watsonville Slough Trail east of Highway 1, and the Monterey Bay Sanctuary Scenic Trail Network (MBSST Rail Trail) at the south end of the proposed project. There is currently no through access on Lee Road because a portion of the Road is submerged under the waters of Struve Slough. The trail components are described further below and summarized in Table 1 of the attached Biotic Assessment.

The 1.4-mile-long proposed project would install approximately 0.68-mile of new pervious concrete pedestrian/bicycle path, construct a new 940-foot-long (0.17 mile) pedestrian/bicycle bridge over Struve Slough, and add chip seal to the existing 0.12-mile unpaved spur trail along Watsonville Slough. The proposed project also includes installation of new sidewalks along Harkins Slough Road (0.10 mile) and Lee Road (0.33 mile), restriping portions of Harkins Slough Road and Lee Road to add new crosswalks and bicycle lanes, pavement widening of a portion of Lee Road (south of Struve Slough) to accommodate bicycle lanes, replacement of the existing culvert where Lee Road crosses a channelized portion of Watsonville Slough, and installation of Educational/interpretive signage and fencing along the east side of Lee Road (north of Struve Slough) where the new pedestrian/bicycle path is proposed along the edge of the California Department of Fish and Wildlife (CDFW) Watsonville Slough Ecological Reserve.

The new pedestrian/bicycle paths would be 8-foot-wide with 2-foot-wide unpaved shoulders, and would be installed in two separate locations along the project alignment: 1) Approximately 0.68-mile of trail would occur parallel to, and along the east side, of Lee Road about 5 feet from the existing pavement, and would be constructed of pervious concrete. 2) Another 0.12-mile of new path would be installed on the alignment of an existing dirt trail parallel to Watsonville Slough that extends perpendicularly east from Lee Road under Highway 1 to the convergence with the existing Manabe-Ow Trail, and would be constructed of impervious chip seal.

Through traffic along Lee Road is restricted on both sides of Struve Slough by ranch swing gates. Between these gates, approximately 500 feet of pavement occurs before the existing paved original grade of Lee Road is submerged under the waters of Struve Slough. At each gate, the trail alignment would transition onto the existing pavement. Both gates would be modified as part of the trail project with improvements to allow pedestrian and bicycle access while still restricting public vehicular access. A new 12-foot-wide, 940-foot-long pedestrian/bicycle bridge over Struve Slough would be constructed to connect the two sides. The bridge would be constructed with abutments on each end and up to 4 piers within Struve Slough. Installation of a water diversion system in Struve Slough will be required to install the new bridge. Access for installation of the bridge piers is proposed to occur on the existing paved road surface that occurs below the OHWM of the Slough once the area is dewatered.

South of Struve Slough, Lee Road would be widened on both sides to accommodate bicycle lanes. Installation of a sidewalk is proposed along the west side of the roadway beyond the gate. An existing storm drainage ditch along the east side of the road, south of the Watsonville Slough channel would be filled in and replaced with a stormdrain pipe to accommodate the road widening to the east. This pipe would outfall into Watsonville Slough.

The culvert that carries Watsonville Slough under Lee Road (south of Struve Slough) must be replaced to accommodate the new sidewalk and roadway improvements. The existing culvert, made up of two deteriorating 60” corrugated metal pipes, would be replaced with a flat bottom box culvert. The replacement culvert will be longer than the existing pipes, but would be designed so the invert and elevation of the roadway are consistent with the existing conditions. Installation of a water diversion system in Watsonville Slough will be required to replace this culvert.

As described in further detail in the attached Biotic Assessment, the project will be constructed in three phases of project implementation: Phase 1 of project implementation includes the portion of Lee Road North of Struve Slough, which is located between Harkins Slough Road and the Struve Slough Bridge. Phase 2 of project implementation includes the portion between the Struve Slough Bridge and Watsonville Slough, as well as the Watsonville Slough spur trail. Phase 3 of project implementation includes the portion of Lee Road South of the Watsonville Slough channel.

Baseline Environmental Conditions

The approximately 54.2-acre linear Biological Study Area includes the Project Impact Area of the proposed 1.4-mile project, and an approximately 150-foot buffer. The Study Area is generally flat to gently sloping and occurs mostly along the alignment of existing roadways.

The Biotic Assessment (Attachment 1) identifies eleven habitat types occurring within the Study Area: non-native grassland, coastal scrub, freshwater marsh, seasonal wetlands, seep wetland, arroyo willow riparian, aquatic (Struve Slough), agricultural fields, non-native forest, ruderal, and developed/landscaped. Figure 4 on page 29 of the Biotic Assessment shows habitat types and plant communities identified in the Study Area. The Biotic Assessment also identifies a large 72-inch diameter (DBH) eucalyptus tree located south of Struve Slough along the eastern edge of Lee Road.

The portions of the Study Area dominated by ruderal vegetation, non-native grasslands, existing agricultural fields, and previously developed areas occur along the existing asphalt roadways of Harkins Slough Road and Lee Road.

Struve Slough is a perennial, non-tidal freshwater slough that passes through the Study Area where construction of the new pedestrian/bicycle bridge is proposed. Freshwater marsh and arroyo willow riparian habitats occur along the banks of Struve Slough within the Study Area.

Watsonville Slough is a perennial slough that has been channelized in the Study Area and is carried under Lee Road through a culvert comprised of two 60" corrugated metal pipes. The bed and banks of Watsonville Slough are dominated by freshwater marsh on both sides of Lee Road. No OHWM or open-water habitat was identified during field surveys. The non-native forest habitat is comprised of a hedgerow of eucalyptus and non-native pine trees located along the top of Watsonville Slough on its north bank where a portion of new trail is proposed.

A small seasonal wetland (0.07-acre) was identified near the southeast corner of the Harkins Slough Road/Lee Road intersection. This roadside feature is located in an area of high foot traffic near the entrance to the CDFW Reserve and is dominated by weedy annual vegetation. A 0.01-acre wetland seep dominated by Santa Barbara sedge is located along the eastern embankment of Lee Road immediately north of where the road becomes submerged beneath Struve Slough. While these two features meet the three parameters that define a wetland, according to the analysis in the Biotic Assessment, in their current condition these features provide only marginal value for wildlife or water quality.

An additional 0.26 acre recently restored seasonal wetland is located northeast of the CDFW gate along Harkins Slough Road directly across from the driveway to the Pajaro Valley High School. This feature is outside of the impact area of the project.

An area dominated by coastal scrub begins just above the fringe of emergent freshwater marsh of Struve Slough and extends up the hillside. Coastal Scrub also occurs along the margins of the CDFW Reserve east of the proposed trail.

Struve Slough and Watsonville Slough are associated with a larger connected complex of freshwater sloughs known as the Watsonville Slough System. This system also includes Harkins Slough, Hanson Slough, and Gilligan Slough. These interconnected sloughs, their associated riparian areas, emergent wetlands, and surrounding agricultural lands create a rich mosaic of aquatic, wetland, and upland habitats in and around the project impact area.

Analysis

Coastal Scrub, Arroyo Willow Riparian, wetlands, and perennial drainages are considered sensitive under Santa Cruz County's Sensitive Habitat Protection and Riparian Corridor and Wetlands Protection ordinances (Chapters 16.30 and 16.32). Riparian Corridors, as defined by Santa Cruz County Code (SCCC) Section 16.30.030 are granted special protections. Lands extending 100 feet (measured horizontally) from the high-water mark of a lake, wetland, estuary, lagoon or natural body of standing water, lands extending 30 feet (measured horizontally) out from each side of an intermittent stream, lands extending 50 feet (measured horizontally) out from each side of a perennial stream, and lands containing a riparian woodland are considered Riparian Corridors. Development activities are prohibited within Riparian Corridors unless Riparian Exception Findings (SCCC 16.30.060) are met and a Riparian Exception is authorized. SCCC Section 13.20.130(B)(2) includes requirements for minimizing site disturbance associated with grading, earth moving, and removal of major vegetation in the Coastal Zone. Pursuant to SCCC 13.20, mature trees in the Coastal Zone should be retained when possible.

Wetlands, ponds, and drainages on the property may be regulated under the Clean Water Act Section 404 by the U.S. Army Corps of Engineers (USACE), and Section 401 by the Regional Water Quality Control Board (RWQCB). These features and associated banks of the drainages may be subject to regulation under the Porter-Cologne Water Quality Act as "Waters of the State", and under California Fish and Game Code Section 1602.

Biological Resources including special-status species and their habitats, riparian habitats, federally protected wetlands, migration corridors for wildlife, and other sensitive natural communities as identified by local policies, CDFW, or USFWS are also protected under the California Environmental Quality Act (CEQA). Additionally, the Coastal Scrub, Arroyo Willow Riparian Scrub, wetlands, and habitat for special-status species are also offered special protections under the California Coastal Act as Environmentally Sensitive Habitat Areas (ESHA).

Sensitive plant species are not expected to occur in the project Impact Area, and no impacts to sensitive plant species are anticipated to result from the proposed Project.

The project site and surrounding areas provide habitat for a variety of terrestrial and aquatic wildlife species including special-status species protected under Federal, State, and Local regulations.

The project site contains breeding habitat and upland habitat for Federal Threatened California red-legged frog (*Rana draytonii*; CRLF) and is partially located within Federally designated Critical Habitat for this species (northern portion up to the southern embankment of Struve Slough). Potential habitat is also present for State Endangered bald eagle (*Haliaeetus leucocephalus)*, State Threatened tricolored blackbird (*Agelaius tricolor*, TCBB), State Fully Protected white-tailed kite (*Elanus leucurus*), and the following State Species of Special Concern: western pond turtle (*Emys marmorata)*, northern harrier (*Circus hudsonius*), western burrowing owl (*Athene cunicularia*), grasshopper sparrow(*Ammodramus savannarum*), and San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*). Based on a USFWS protocol site assessment, long-toed salamander and California tiger salamander are not expected to occur with the Study Area.

CRLF are known to occur in Struve Slough, the channelized portion of Watsonville Slough, and surrounding areas. WPT are also known to occur in Struve Slough. The bald eagle is known to nest in lower Harkins Slough and may forage over the sloughs and grasslands within the Study Area. Offspring may nest in the vicinity. TCBB historically nested in Struve Slough and Hanson Slough, and the emergent wetlands in the study area provide potential nesting habitat for this species. Willow Riparian and Coastal Scrub provide potential habitat for San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens; SSC*).

Common bat species protected under Fish and Game Code may also utilize the Study Area for breeding and foraging. Large trees, shrublands, and grasslands in the study area also provide potential nesting and foraging habitat for birds of prey and migratory birds. Birds of prey and migratory birds are offered protection under the California Fish and Game Code, and the Federal Migratory Bird Treaty Act (MBTA). Under the MBTA, it is "unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill" a migratory bird unless and except as permitted by regulations.

The Impact Figure included as Appendix G of the attached Biotic Assessment shows the project footprint in relation to specific habitats on site. Impacts to sensitive habitats are included in Table ES-1 of the Biotic Assessment. These impacts are summarized in the table and text below. The project will be required to restore all temporarily impacted areas to pre-project contours and conditions, or better where possible, upon project completion. Compensatory mitigation is required for unavoidable permanent impacts to sensitive habitats. Measures requiring habitat restoration and compensatory mitigation have been included in the conditions of approval below.

Habitat Type	Permanent Impacts (acres)	Temporary Impacts (acres)
Struve Slough (Aquatic)	0.003	0.497
Freshwater Marsh	0.017	0.121
Arroyo Willow Riparian	0.017	0.031
Seasonal Wetlands	0.005	0.009
Seep Wetland	0.010	--
Coastal Scrub	0.077	0.028

Impacts to Struve Slough
Installation of bridge piers would result in approximately 0.003 acre of permanent impact below the OHWM of Struve Slough. Temporary impacts below the OHWM of Struve Slough would result from installation of the water diversion system, and equipment access during bridge construction.

Impacts to Freshwater Marsh
Approximately 0.017 acre of permanent impact to freshwater marsh will result from construction of the new bridge (approach, bridge deck, abutments) over Struve Slough and replacement of the culvert in Watsonville Slough. Temporary impacts to freshwater marsh will result from construction access for installing the water diversion systems and construction activities within both sloughs.

Impacts to Arroyo Willow Riparian
Construction of the new bridge (approach, bridge deck, abutments) will result in approximately 0.017 acre of permanent impact to Arroyo Willow Riparian habitat that occurs along the banks of Struve Slough. Temporary impacts to arroyo willow riparian would result from equipment access during bridge construction.

Impacts to Seasonal Wetlands
Construction of the new bicycle/pedestrian path would result in approximately 0.005 acre of permanent impact to the weedy seasonal wetland near the southeast corner of the Harkins Slough Road/Lee Road intersection.

Impacts to Seep Wetland
Construction of the new bicycle/pedestrian path will require cutting into the existing hillslope and installing drainage improvements where the seep wetland occurs. It is assumed this will result in permanent displacement of this feature in the amount of 0.010 acre of permanent impact.

Impacts to Coastal Scrub Habitat
Construction of the new bicycle/pedestrian path will require cutting into the existing hillslope east of Lee Road just north of Struve Slough which will result in 0.077 acre of permanent impact to Coastal Scrub.

Impacts to Mature Trees
One large (72-inch DBH) eucalyptus tree is proposed for removal to allow installation of the proposed southern Struve Slough Bridge approach.

Impacts to Special-Status Species
The impacts listed above to sensitive habitats also have the potential to result in direct and/or indirect impacts to special-status species that occur within those habitats. Project construction activities in aquatic habitats and upland areas including grubbing and vegetation removal, removal of mature trees, grading, and equipment and vehicle access could result in direct injury or mortality to special-status species such as nesting birds, roosting bats, CRLF, and WPT; and could cause harassment and nest abandonment through increased noise levels, vibrational, and visual disturbances, and barriers to movement and dispersal.

Construction activities would temporarily reduce available upland, aquatic, and dispersal habitat for CRLF and other species. These activities could interfere with important life events, including movement to breeding habitat, breeding, foraging, dispersal, and movement to aquatic non-breeding habitats.

Conclusion

The impact area for the proposed new pedestrian/bicycle paths and sidewalks is largely located within or adjacent to the developed footprint of roadways and ruderal road shoulders that are dominated by non-native grasslands, existing agricultural fields, and previously developed areas. The completed project is not expected to create any permanent impediments to dispersal of CRLF, WPT, or other species. Construction related activities could result in indirect impacts, and direct injury or mortality, to special-status species.

Conditions have been included below to avoid and minimize these impacts to the maximum extent possible. Conditions are also included that are intended to minimize operational impacts that might result from increased human activity due to trail use. Best Management Practices (BMPs) have been included in the project design to avoid and minimize potential impacts to sensitive biological resources. Detailed descriptions of proposed construction activities and methods of avoidance and minimization are included in the attached documents.

Replacement of the culvert in Watsonville Slough is expected to improve existing conditions, including habitat for CRLF, by replacing two deteriorating metal pipes with a flat bottom box culvert.

All temporarily impacted areas must be restored to pre-project contours and conditions, or better where possible, upon project completion. Conditions for habitat restoration and compensatory mitigation for unavoidable permanent impacts have been included below. Habitat restoration activities associated with the project will result in a net increase in wetland and riparian habitat.

There are sensitive habitat constraints on the project site associated with wetlands, riparian habitat, special-status species, and habitat for nesting birds that must be considered prior to and during project implementation. Conditions have been included below to ensure that impacts to special-status species, their habitats, and other sensitive habitats will be *less than significant.*

The Conditions of Approval below shall be incorporated into all phases of development for this project as applicable.

Conditions of Approval

In order to conduct development activities for the Lee Road Trail Project, the following conditions shall be adhered to:

1. No work shall occur within a County defined Riparian Corridor unless the Riparian Exception Findings are met, and a Riparian Exception is authorized.

2. The project proponent is responsible for obtaining all necessary approvals and permits from the appropriate regulatory agencies including the County of Santa Cruz, the United States Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), and the United States Fish and Wildlife Service (USFWS).

    a. Endangered Species Act Consultation with USFWS for potential effects on California red-legged frog shall be completed.

    b. Permit approvals shall be submitted to Environmental Planning Staff prior to commencement of construction.

    c. All measures and conditions included in permit approvals shall be adhered to.

3. Prior to any site disturbance, a pre-construction meeting shall be conducted. The purpose of the meeting will be to ensure that the conditions set forth in the proposed project description and permit requirements are communicated to the various parties responsible for constructing the project. The meeting shall involve all relevant parties including the project proponent, construction supervisor, Environmental Planning Staff, and the project biologist.

4. To minimize impacts to sensitive habitats and special-status species the following conditions shall be adhered to:
    a. Every individual working on the Project must attend biological awareness training prior to working on the job site. The training shall be delivered by a USFWS approved biologist and shall include at minimum information regarding the following:
        i. Location and identification of sensitive habitats and all special-status species with potential to occur in the project area including information specific to identifying California red-legged frog (*Rana draytonii*; CRLF) and its habitat, and the measures being implemented to protect CRLF for the current project.
        ii. The importance of avoiding impacts to special-status species and their habitat, and the steps necessary if any special-status species is encountered at any time.
        iii. Best management practices to be implemented, identification of the limits of work, and project-specific avoidance measures and permit conditions that must be followed.
    b. The location of sensitive habitats and all areas to be protected with exclusion fencing shall be included on the final project plans and must be approved by Environmental Planning Staff prior to final plan approval.
    c. Prior to commencement of construction, high visibility fencing and/or flagging shall be installed, with the assistance of a qualified biologist, to indicate the limits of work and the boundaries of sensitive habitat areas to be avoided.
        i. Environmentally sensitive areas intended for protection during construction shall be clearly marked.
        ii. No work-related activity including equipment staging, vehicular access, grading and/or vegetation removal shall be allowed outside the designated limits of work.
        iii. The fencing shall be inspected and maintained daily until project completion.

d. Erosion and sediment control measures must be in place, and best management practices adhered to during construction. All disturbed soils shall be stabilized to prevent siltation and reduce sediment and chemical-laden runoff into any drainages or water courses within the project vicinity.
e. All refueling, maintenance, and staging of equipment and vehicles will occur at least 60 feet from aquatic or riparian habitat and not in a location from where a spill would drain directly toward aquatic habitat. A spill response plan shall be in place for such an event.
f. One large (72-inch DBH) eucalyptus tree is proposed for removal. Pursuant to SCCC Section 13.20.130(B)(2) removal of this tree should be avoided if possible. If avoidance is not possible, adequate compensation for the loss of habitat associated with removal of a tree this size, shall be included in the project Habitat Mitigation and Monitoring Plan as outlined in the Biotic Assessment and Condition 9 below.

5. To avoid/minimize impacts to CRLF, WPT, and other special-status species, the following shall be adhered to unless otherwise advised or authorized by USFWS or CDFW:

   a. The Project proponent shall implement all measures required by the USFWS as part of project-specific Endangered Species Act Consultation for California red-legged frog (*Rana draytonii*).

   b. Capturing and handling CRLF is not permitted unless a project-specific Take Permit has been obtained from USFWS. Only USFWS-approved biologists shall participate in activities associated with capturing and handling of CRLF. The agency-approved biologist(s) shall be onsite during all activities that may result in take of CRLF.

   c. Ground-disturbing activities in upland areas including clearing, grubbing, and grading shall not occur between November 1 and March 31 because that is the time period when California red-legged frogs are most likely to be moving through upland areas. Construction activities shall not take place at night or during rain events. Consult weather forecasts from the National Weather Service at least 72 hours prior to performing work.

   d. Within 48 hours prior to commencement of development related site disturbance (including clearing and grubbing) a qualified biologist shall survey the project disturbance area to identify the presence of any special status species. If any individual special-status species are found and these individuals are likely to be injured or killed by work activities the qualified biologist shall be allowed enough time to move them from the site before work activities begin.

   e. If a western pond turtle egg clutch is discovered during pre-construction surveys, or at any time during construction, work in the vicinity of the egg clutch shall be halted immediately. Unless otherwise advised by CDFW, the nest location shall be surrounded with high visibility fencing under the guidance of a qualified biologist and shall be avoided until the biologist determines that the clutch has hatched and individuals are no longer likely to be injured by work activities.

   f. Prior to initiation of construction activities, exclusion fencing (solid silt fencing) shall be installed, with the assistance of the agency-approved biologist, in areas along locations determined in conjunction with USFWS and CDFW. Fences should be 2.0 feet below grade and 3.0 feet above grade, with wooden stakes at intervals of not more than 5.0 feet. The fence shall be inspected daily and maintained in working order for the duration of construction activities.

g. If a special-status species is identified at any time prior to or during construction, work shall cease immediately in the vicinity of the individual. The animal shall either be allowed to move out of harm's way on its own or the project biologist or agency-approved construction monitor shall move the animal out of harm's way to a safe relocation site.

h. During construction within the active channels of Struve Slough and Watsonville Slough (i.e. installation of water diversion systems) the agency-approved biologist shall be present to relocate CRLF and WPT out of harm's way as needed. The qualified biologist shall oversee the installation of the diversion/dewatering system to divert stream flow around the active construction area. Construction activity other than installation of water diversion/dewatering systems shall occur only within dry or dewatered areas.

i. Once water diversion systems are in place and work areas are dewatered, an alternate construction monitor may be designated for execution of daily monitoring activities if approved by USFWS and CDFW.

j. The approved biologist or agency-approved construction monitor shall be present during initial clearing, grubbing, and grading for work along the boundary of the CDFW Reserve.

k. The approved biologist and agency-approved construction monitor shall have the authority to stop work that may result in the "take" of a special-status species and shall be given enough time to ensure that animals have been properly moved out of harm's way to a designated relocation site.

l. Daily monitoring by the project biologist or agency-approved construction monitor shall occur for the duration of project construction within all areas identified as "sensitive habitat" in the study area (including aquatic and upland habitat for CRLF). Daily monitoring activities shall include the following at minimum:

   i. Monitoring the work area for the presence of special-status species and ensuring that individuals are properly relocated out of harm's way as needed.
   ii. Monitoring the ESA fences and exclusionary fences at the project site to ensure good working condition and prevent wildlife entrapment.
   iii. Checking under all equipment for wildlife before use.
   iv. Ensuring that at the end of each workday, all excavations shall be secured with a cover, or a ramp installed to prevent wildlife entrapment.
   v. All trenches, pipes, culverts or similar structures shall be inspected for animals prior to burying, capping, moving, or filling.

6. To protect San Francisco dusky-footed woodrat, a qualified biologist shall implement the following protection measures:

   a. Within two weeks prior to commencement of development activities (including clearing and grubbing) a qualified biologist shall survey the project disturbance area to identify any woodrat nest locations that may be affected by the proposed development. All woodrat houses within the construction impact area and immediate surroundings shall be clearly flagged.

   b. If no woodrat nests are found during the survey, no further avoidance and minimization measures for this species are necessary.

c. If woodrat houses are found, the construction contractor shall avoid the houses to the extent feasible by installing a 25-foot buffer with protective fencing or other material that shall prohibit encroachment. A reduction in the size of this buffer, or encroachment into this buffer, may be allowed if the biologist determines that microhabitat conditions such as shade, cover and adjacent food sources can be retained.

d. If avoidance of woodrat houses is not possible, a qualified biologist shall develop and implement a Woodrat Relocation Plan to be implemented prior to the commencement of construction. The plan shall be developed in consultation with CDFW and shall include the following:

    a. Trapping and relocation activities shall be conducted during the months of August – September when the species is active and young are able to disperse on their own. Trapping efforts shall not take place during low night temperatures (below 40 degrees Fahrenheit), inclement or extreme weather conditions.

    b. If no San Francisco ducky-footed woodrats are captured at a given house, it shall be dismantled by hand to ground level, and the woody debris spread to reduce rebuilding.

    c. For occupied houses, the existing woodrat house shall be dismantled and the woody debris, including cached food and nesting material, carried to the nearest suitable relocation site outside the Project footprint and used to build an artificial shelter.

    d. Sites for artificial shelters shall be located as near as possible to the original house location and no closer than 20 feet from existing woodrat houses and other artificial shelters. Choose the best available microhabitat, ideally in a location with sun and shade and if possible under the same species of tree or shrub as was present at the original house location. Relocation sites shall contain biologically-suitable habitat features (e.g. stands of poison oak, coast live oaks, and dense native brush).

    e. When releasing woodrats, the occupied live-trap shall be placed against the entrance to the artificial shelter, opened, and the woodrat allowed to enter, ideally on its own accord. After the individual enters, the entrance shall be loosely but completely plugged with dirt and leaf duff to encourage it to stay, at least for the short-term.

    f. If occupied houses were relocated, monitoring shall be conducted for 30 days after relocation is completed and include infrared and motion activated cameras and an occupancy assessment. A report on San Francisco dusky-footed woodrat nest monitoring shall be provided to CDFW and County Environmental Planning within 30 days following the end of the monitoring period and shall include the methods and results of trapping and relocation, occupancy determinations, and discussion of any remedies that may be needed.

7. To avoid/minimize impacts to nesting birds the following measures shall be adhered:
   a. If removal of vegetation, grading activity, or other use of heavy equipment begins outside of the February 1 to August 31 breeding season, there will be no need to conduct a preconstruction survey for active nests.
   b. Trees intended for removal shall be removed during the period of September 1st through January 31st, in order to avoid the nesting season.
   c. If removal of vegetation, grading activity, or other use of heavy equipment is to commence between February 1st and August 31st, a survey for active bird nests shall be conducted by a qualified biologist within two weeks prior to the start of such activity. The survey area shall include the project area, and a survey radius around the project area of 50 feet for MBTA birds and 250 feet for birds of prey.
   d. If no active nest of a bird of prey or MBTA bird is found, then no further avoidance and minimization measures are necessary.
   e. If active nest(s) of tricolored blackbird or western burrowing owl are found in the survey area, the project proponent shall contact CDFW immediately to determine the appropriate course of action and potential conservation measures to implement.
   f. If active nest(s) of MBTA birds or birds of prey are found in the survey area, the following avoidance buffers shall be adhered to unless otherwise advised by CDFW or USFWS: Avoidance buffer of 50 feet for MBTA birds and 250 feet for birds of prey shall be established around the active nest(s). The biologist shall monitor the nest and advise the applicant when all young have fledged the nest. Removal of vegetation, grading activity, or other use of heavy equipment may begin after fledging is complete.
   g. If the biologist determines that a smaller avoidance buffer will provide adequate protection for nesting birds, a proposal for alternative avoidance/protective measures, potentially including a smaller avoidance buffer and construction monitoring, may be submitted to USFWS and CDFW for review and approval prior to removal of vegetation, grading activity, or other use of heavy equipment.
   h. If removal of vegetation, grading activity, or other use of heavy equipment stops for more than two weeks during the nesting season (February 1st - August 31st) a new survey shall be conducted prior to re-commencement of construction.
8. To avoid/minimize impacts to special-status bats the following measures shall be adhered to:
   a. Conduct limbing/tree removal operations between September 15 and November 1 to avoid bat maternity roosts and winter hibernacula.
   b. Prior to commencement of construction related activities including tree trimming and removal, a qualified biologist shall conduct a pre-construction survey for bats as follows:
      i. The biologist shall determine if bats are utilizing the site for roosting. For any trees/snags/buildings that could provide roosting space for cavity or foliage-roosting bats, potential bat roost features shall be thoroughly evaluated to determine if bats are present. Visual inspection and/or acoustic surveys shall be utilized as initial techniques.
      ii. If roosting bats are found, the biologist shall develop and implement acceptable passive exclusion methods in coordination with or based on CDFW

recommendations. If feasible, exclusion shall take place during the appropriate windows (September 15 and November 1) to avoid harming bat maternity roosts and/or winter hibernacula. (Authorization from CDFW is required to evict winter hibernacula for bats).

iii. If established maternity colonies are found, in coordination with CDFW, a buffer shall be established around the colony to protect pre-volant young from construction disturbances until the young can fly; or implement other measures acceptable to CDFW.

iv. If a tree is determined not to be an active roost site for roosting bats, it may be immediately limbed or removed as follows:

- If foliage roosting bats are determined to be present, limbs shall be lowered, inspected for bats by a bat biologist, and chipped immediately or moved to a dump site.
- Alternately, limbs may be lowered and left on the ground until the following day, when they can be chipped or moved to a dump site. No logs or tree sections shall be dropped on downed limbs or limb piles that have not been in place since the previous day.

9. To compensate for disturbance of sensitive habitats, and to comply with the Santa Cruz County General Plan Policy 5.1.12, restoration of degraded sensitive habitat shall be required. A site-specific Conceptual Mitigation Plan (CMP) shall be developed for compensation of impacts to Struve Slough (Aquatic), Freshwater Marsh, Arroyo Willow Riparian, Wetlands, Coastal Scrub, and mature trees. The CMP shall be prepared by a qualified biologist or restoration professional, and shall include the following minimum elements:

a. Identification of areas on site where temporary disturbance and re-establishment of native habitat shall occur. All areas temporarily disturbed as a result of the project shall be restored to pre-project contours to the maximum extent possible and re-vegetated with native plant species appropriate to the habitat disturbed.

b. Identification of on-site or off-site restoration areas to compensate for permanently impacted sensitive habitats. All sensitive habitats permanently impacted as a result of the project shall be compensated for at a minimum 2:1 ratio through restoration or establishment of in-kind habitat at designated restoration areas on site, or at off-site locations on nearby properties identified through coordination with Watsonville Wetland's Watch and/or CDFW.

i. Riparian and wetland restoration areas may be identified along previously disturbed portions of Struve Slough or Watsonville Slough where these habitats are degraded and/or not currently present.

ii. Restoration, establishment, or enhancement of in-kind habitat at designated restoration sites on nearby properties may be identified in consultation with Watsonville Wetland's Watch.

c. A site-specific planting plan intended to inform the re-vegetation efforts. Local plant stock shall be used whenever possible. The plant pallet should include native species common to the surrounding native habitats that are being restored.

i. Species, size, and locations of all restoration plantings should be included in the planting plan and this plan must be included in the final project plans.

ii. Native plantings shall occur at sizes and ratios determined by the restoration specialist to adequately restore native habitat while maximizing plant health and survivability of individual trees and shrubs.

iii. In areas designated for emergent wetland or seasonal wetland restoration, wetland plantings of native hydrophytic plant species and native erosion seed mix specific to wetlands shall be installed.

d. Information regarding the methods of irrigation for restoration plantings.

e. Plan for removal of non-native species and a management strategy to control re-establishment of invasive non-native species within the project impact area.

f. 5-year management plan for maintenance and monitoring of restored areas to maintain 100% survival of installed container stock in year 1, 90% survival in years 2-3, and at least 80% survival in years 4-5. Replacement plants shall be installed as needed during the monitoring period to meet survival rates. Annual habitat monitoring reports shall be submitted to the County Planning Department by December 31 of each monitoring year.

g. The project proponent shall be responsible for execution of the 5-year management plan for maintenance and monitoring of restored areas. If responsibility is transferred legally to another entity, County Environmental Planning Staff shall be informed of any such transfer of responsibility.

h. Establishment and planting of all restoration and mitigation area(s) as outlined in the final approved Restoration Planting Plan shall be inspected and approved by Environmental Planning staff prior to final project approval.

10. To minimize impacts to CRLF and degradation of its habitat during trail operation, a qualified biologist shall develop a post construction monitoring program for CRLF. The monitoring program shall be a standalone document prepared and implemented in conjunction with the CMP. The details of the CRLF monitoring program shall be developed in consultation with USFWS and CDFW and shall include the following.

    a. An agency-approved biologist shall identify and map occupied and potential CRLF aquatic (breeding and non-breeding), upland, refuge, movement, and dispersal habitat within and adjacent to the CDFW Reserve, proposed Struve Slough Bridge crossing, and channelized Watsonville Slough.

    b. Strategies to protect these areas from take of individual CRLF or degradation associated with trail operation.

    c. To ensure degradation of habitat is not occurring, the approved biologist shall conduct monitoring of CRLF habitat (at a frequency to be determined in consultation with the agencies) for a total of 5 years unless otherwise advised or authorized by USFWS or CDFW.

    d. The monitor will confirm that all required protective measures are being implemented, and in the event that the monitoring biologist identifies degradation of CRLF habitat, the biologist shall develop provisions for adaptive management to modify and/or supplement existing protective measures.

e. Results of the CRLF post construction monitoring program and recommendations for supplemental protective measures shall be presented annually in conjunction with the project's annual CMP report submitted to the County Planning Department by December 31 of each monitoring year.

These conditions should be incorporated as mitigation measures into the CEQA document prior to public circulation. By complying with these conditions, the project will result in *no significant impacts* to special status species and sensitive habitats and will improve habitat features present on site.

A copy of this biotic approval, including attachments, should be submitted with any future permit applications.

If you have any questions regarding this letter, please feel free to contact me by email or telephone at Juliette.Robinson@santacruzcounty.us or 831-454-3156.

Sincerely,

Juliette Robinson
Resource Planner IV, Biologist

CC: Leah MacCarter, Area Resource Planner
Matt Johnston, Environmental Coordinator
Randall Adams, Project Planner

Biotic Assessment for the
Proposed Lee Road Trail Project
City of Watsonville and County of Santa Cruz

Prepared for

City of Watsonville
and
County of Santa Cruz

Prepared by

EcoSystems West Consulting Group
180 7th Avenue, Suite 201
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October 2020

EXECUTIVE SUMMARY

Summary Project Description

This report presents the findings of a biotic assessment conducted by EcoSystems West Consulting Group (EcoSystems West) and Bryan Mori Biological Consulting Services of the proposed Lee Road Trail Project alignment and surroundings in the City of Watsonville (City) and County of Santa Cruz (County) (see **Figures 2**). A joint effort by the City and County, the proposed project consists of a 1.43-mile-long and 12-foot-wide pedestrian/bicycle scenic nature trail along the east (inland) side of Lee Road, with a pedestrian/bicycle bridge over Struve Slough where Lee Road is submerged. The trail would also include a short stretch along the northwest side of Harkins Slough Road to Pajaro Valley High School and along the unpaved path located on the north side of channelized Watsonville Slough to the convergence with the existing Manabe-Ow Trail under Highway 1. To accommodate the proposed sidewalk and bike lane crossings, the existing culvert under Lee Road for channelized Watsonville Slough would be replaced.
Two additional design options are being considered. One of these is for the northern section of the trail between Harkins Slough Road and Struve Slough, in which the proposed trail would be located on the west (coastal) side of Lee Road between Harkins Slough Road and the Watsonville Slough Farm driveway and proposed crosswalk (West Side Design Option B). The other design option is for the southern section of the trail, in which the trail would be positioned on the east side of Lee Road instead of the west (East Side Design Option).

The proposed trail alignment spans jurisdictions of the City and the County with portions of the trail located in the Coastal Zone (See **Appendix G**). The trail would meet Americans with Disabilities Act requirements and would include up to three vista points. The northern portion of the proposed trail is adjacent to the California Department of Fish and Wildlife Ecological Reserve (CDFW Reserve). The trail would be open to pedestrians and cyclists from dawn to dusk. City and County Public Works Departments would maintain the trail with support from law enforcement services from both jurisdictions.
The trail would be constructed in three phases between 2021 and 2026. Best Management Practices would be implemented during construction to protect natural resources, including air and water quality, and biological resources.

Summary of Methods

The approximately 54.2-acre linear Study Area[1] was determined to be the trail alignment (and two design options) and an approximately 150-foot buffer on either side. In general, the trail is proposed to occur along the existing roadway within or adjacent to the developed footprint of the roadway and shoulder on the north side of Struve Slough, with the proposed bridge across Struve Slough above the existing seasonally- to perennially-submerged Lee Road, and within the industrial developed footprint on the south side of Struve Slough. The surrounding area includes Pajaro Valley High School; the CDFW Reserve; West Struve Slough, Struve Slough, Chivos Pond on Watsonville Slough Farm, channelized Watsonville Slough and associated riparian habitats; agricultural fields; the ruderal and developed areas associated with the roadway, driveways, and farm facilities and infrastructure; and a light industrial area.
EcoSystems West biologists conducted a thorough literature and database search to determine sensitive biological resources with potential to occur and their conservation status. We also consulted other local experts for occurrence and distribution information.

[1] For certain resources, such as red-legged frog (CRLF) (*Rana draytonii*) and birds, we considered a larger area based on distribution information, agencies standards and/or protocols.

In June, July, August, and September of 2019 and May of 2020, EcoSystems West and Bryan Mori Consulting Services characterized and evaluated the Study Area for biological resources, including sensitive plants, wildlife species, and habitats, wetlands and other waters of the U.S. We assessed potential impacts to these resources and developed measures to minimize and mitigate for potential impacts. We considered local, state, and federal regulatory authorities in our assessment. City ordinances were considered for those sections of the proposed trail within the City's jurisdiction and County ordinances were considered for those sections of the trail within the County's jurisdiction (**Appendix G**). Where the proposed trail alignment falls within the Coastal Zone, we also considered the Local Coastal Programs (LCP) for each jurisdiction.

Based on CDFW and other standard survey protocols, we reviewed distribution information for sensitive species to determine which species would have the potential to occur in or near the alignments and which species could be eliminated from consideration, based on soils, vegetation and habitat types in the alignments and surroundings, locations of known occurrences, dispersal distances (for wildlife), and professional knowledge of the region and local sensitive species.

Summary of Results

EcoSystems West recorded 93 species of vascular plants within the Study Area (**Appendix C**). Twenty-six of these identified species are native, and 67 species are non-native. Of the non-native species, 17 are considered invasive species with "moderate" or "high" ecological impacts by the California Invasive Plant Council (Cal-IPC, 2020). No special-status plant species were observed in 2019 and 2020 within the Study Area during focused rare plant surveys or other site visits.
We recognize seven predominant habitat types occurring within the Study Area:

- Non-native grassland (with scattered coyote brush),
- Coastal scrub (*Baccharis pilularis* Alliance and *Rubus* Alliance),
- Palustrine emergent wetlands,
- Arroyo willow riparian,
- Aquatic,
- Agricultural fields,
- Non-native forest (eucalyptus hedgerow),
- Ruderal/ruderal scrub, and
- Developed/Landscaped.

SENSITIVE HABITAT TYPES

Of the seven habitat types identified in the Study Area, four are considered sensitive habitats:

- Coastal scrub,
- Palustrine emergent wetlands,
- Arroyo willow riparian, and
- Aquatic.

In addition, we considered areas that support sensitive species or high biological diversity to be sensitive, such as CRLF refuge, upland, movement, and dispersal habitats, and edge habitats within the CDFW Reserve that may also support sensitive bird species and the San Francisco dusky-footed woodrat.
The two coastal scrub alliances present near the proposed trail alignment provide habitat for a range of wildlife species, offering varied food sources, cover from predators, and shelter. The coastal scrub habitats are in proximity to West Struve Slough and Struve Slough, as well as to open areas such non-native grassland and agricultural fields. Habitat mosaics and reliable water sources increase the habitat value of

these coastal scrub habitats for wildlife, including common reptiles, numerous bird species (see also Appendix D), and common mammal species. This habitat type is likely to support San Francisco dusky-footed woodrat.

Edge habitats or ecotones are present on the CDFW Reserve, at the intersection between non-native grassland and adjacent coastal scrub and slough habitats. While the grasslands are not considered sensitive, together with the adjacent habitats, these areas are particularly productive and provide a range of foraging, refuge, and nesting opportunities for wildlife species. We documented a number of bird species, including Lawrence's goldfinch, a USFWS Bird of Conservation Concern, using the ecotones near the proposed trail (see also **Appendix D**).

The aquatic, freshwater marsh, and riparian habitats associated with Struve Slough and Watsonville Slough offer important habitat values to wildlife species, providing water and food sources, as well as shade and cover. Aquatic habitats in the area moderate the Mediterranean climate of the region, allowing wildlife to adjust to seasonal and climatic fluctuations. These habitats support a suite of wildlife species including insects, amphibians, birds, and mammals. Sierran chorus frog and CRLF are known to occur in these habitats, as well as the following non-native species: American bullfrog, Louisiana crayfish, common carp, bullheads, mosquitofish, sunfishes, and largemouth bass. Riparian and marsh habitats provide dense multi-tiered canopies with diverse foraging, roosting, sheltering, and/or nesting habitat for birds and are important stopover sites for migratory bird species (**Appendix D**). The riparian vegetation provides cover from predators and insulating properties that shelter wildlife species from the sun and prevailing weather patterns. Foliage-roosting bat species may roost in the riparian habitat and hunt over the adjacent sloughs.

The riparian vegetation also buffers the adjacent aquatic habitat contributing shade, food, and sources of nutrients to the sloughs and aquatic wildlife species. Structurally, downed trees and willow mats create microhabitats that are important for birds, amphibians, and aquatic insects.

The seasonal and seep wetlands along the alignment, while meeting all three criteria as US Army Corps of Engineers jurisdictional features, are saturated only for a short time during the rainy season and provide only marginal benefits to wildlife species.

SENSITIVE WILDLIFE SPECIES

The proposed Lee Road Trail Project Area and Study Area supports or has potential to support 11 sensitive wildlife species. During our 2019 and 2020 surveys, we observed the following sensitive wildlife species:

- white-tailed kite (California Fully Protected), and
- Lawrence's goldfinch (Federal Bird of Conservation Concern).

The following sensitive wildlife species are known to occur in or near the Study Area:

- California red-legged frog (CRLF) (Federally Threatened/California Species of Special Concern),
- western pond turtle (California Species of Special Concern*)*,
- bald eagle (Federally Endangered/California Fully Protected),
- northern harrier (California Species of Special Concern),
- grasshopper sparrow (California Species of Special Concern), and
- oak titmouse (Federal Bird of Conservation Concern).
-

The following species has the potential to occur based on the presence of available suitable habitat and known occurrences in the vicinity:

- San Francisco dusky-footed woodrat (California Species of Special Concern).

The following avian species are known from the vicinity of the Study Area outside of their breeding seasons (and have not been known to breed in the area since 1987 and 2008, respectively):

- western burrowing owl (Federal Bird of Conservation Concern/California Species of Special Concern)
- tricolored blackbird (nesting colony) (California Threatened).

Common avian species are likely to use the Study Area for nesting. Common bat species may utilize the trees within or near the Study Area for roosting, and forage over the sloughs.

Wildlife species are likely to use the sloughs and adjacent uplands for movement between the Study Area and other local habitat patches such as Watsonville Slough Farm and the larger slough system. Marginal connectivity exists through drainages, agricultural fields and hedgerows, between the Study Area and larger contiguous open spaces such as Ellicott Reserve, the Pajaro River, and open spaces in Freedom and Corralitos.

Impacts and Mitigation

The proposed Lee Road Trail has been designed to minimize impacts to biological resources. With a few exceptions, the proposed trail is positioned along the shoulder of Lee Road, and is predominantly displacing ruderal and developed areas. Project impacts are associated with:

- Trail construction and operation along the boundary of the CDFW Reserve; which would displace low-quality seasonal wetland features and non-native grassland open space; and has the potential to impact sensitive wildlife species (CRLF and nesting birds);
- Construction of Struve Slough Bridge, which would impact small amounts of aquatic, freshwater marsh, and riparian habitat types and may impact potential sensitive wildlife (CRLF, WPT, nesting birds, roosting bats);
- Culvert replacement within channelized Watsonville Slough, which would displace a minimal amount of freshwater marsh and has the potential to impact sensitive wildlife (CRLF and nesting birds); and
- Removal of one County of Santa Cruz significant tree (a large non-native eucalyptus tree).

Permanent and temporary impacts to sensitive habitat types are listed in Table ES-1 on the following page (see also **Appendix G**).

Table ES-1. Lee Road Trail Permanent and Temporary Impacts to Sensitive Habitat Types.

Habitat Type	Proposed Project	
	Permanent Impacts	Temporary Impacts
Aquatic	0.003	0.497
Arroyo Willow Riparian	0.017	0.031
Coastal Scrub (*Baccharis pilularis* Alliance)	0.077	0.013
Coastal Scrub (*Rubus* Alliance)	0	0.015
Freshwater Marsh	0.017	0.121
Seasonal Wetland	0.005	0.009
Seep	0.001-0.010**	0-0.010
Total	0.120-0.129	0.686-0.696
Habitat Type	Option B	
	Permanent Impacts	Temporary Impacts
Aquatic	0.003	0.497
Arroyo Willow Riparian	0.017	0.031
Coastal Scrub (*Baccharis pilularis* Alliance)	0.077	0.013
Coastal Scrub (*Rubus* Alliance)	0	0.015
Freshwater Marsh	0.017	0.121
Seasonal Wetland	0.002	0.005
Seep	0.001-0.010**	0-0.010
Total	0.117-0.126	0.682-0.692

* Permanent impact from trail construction is largely located below the canopy of existing trees along Watsonville Slough and may require periodic trimming and/or maintenance but will not require removal of trees.

For the portion of the Project within County of Santa Cruz jurisdiction, a Riparian Exception would be required for impacts to wetlands, aquatic, and riparian habitat and work within the 100-foot buffer. Based on the criteria identified in detail the main body of the document in the Impacts and Mitigation Section, and summarized here, the Project meets the preliminary requirements for approval of a Riparian Exception by the County. The Lee Road Trail, an allowed activity, would provide safe scenic nature trail access for community members and for students between Pajaro Valley High School and the surrounding residential communities, and would be an asset to public welfare. The proposed trail is positioned to minimize impacts to sensitive resources and will not reduce or adversely impact the riparian corridor. Displacement of marginal value seasonal wetlands would be mitigated through replacement and enhancement with higher value wetlands that would enhance habitat conditions withing the CDFW Reserve. The Riparian Exception is necessary for the proper design and function of the trail and there is no feasible less environmentally damaging alternative. The granting of the Riparian Exception is in accordance with the purpose of [Chapter 16.30 Riparian Corridor and Wetlands Protection][2], the General Plan, and the Local Coastal Program Land Use Plan and the trail satisfies the directives of the County of Santa Cruz General Plan and the LCP by providing direct scenic access to the CDFW Reserve and educational opportunities for the community.

Overall, impacts to sensitive resources associated with trail construction and trail operation are minimal and would be further minimized through the implementation of Best Management Practices, such as working only during the dry season next to sensitive resources; minimizing the construction footprint and confining project activities to the designated staging, access, and work areas; using ruderal and developed areas for staging and access; installing construction fencing to protect adjacent sensitive habitats and prevent wildlife from entering the work area; and employing erosion control measures to prevent indirect impacts to adjacent habitats. In addition, protective measures are summarized that further reduce impacts to less-than-significant.

Temporary impacts to sensitive habitats will be mitigated through natural recruitment and, if necessary, replacement planting with suitable locally-sources native plant species. Permanent impacts to sensitive habitats will be mitigated through onsite[3] replacement and/or enhancement, as outlined below.

A Conceptual Mitigation Plan (CMP) will be developed in consultation with the City of Watsonville, County of Santa Cruz, CDFW, the Regional Board, and USFWS; and in collaboration with Watsonville Wetlands Watch, that includes the following elements:

- Creation, enhancement, protection, and monitoring of sensitive habitat types and habitat values, including strategies to prevent degradation associated with trail operation, and adaptive management.
- Monitoring and eradication of invasive weeds to prevent further encroachment into sensitive habitat areas.
- Local law enforcement and public works representatives will immediately alert Watsonville Wetlands Watch, CDFW Reserve Representatives, and/or the assigned monitoring biologist in the event that illegal encampments or other degradation of sensitive habitats (including CRLF habitat) are observed.

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[2] The purpose of this chapter is to minimize and to eliminate any development activities in the riparian corridor, preserve, protect, and restore riparian corridors for: protection of wildlife habitat; protection of water quality; protection of aquatic habitat; protection of open space, cultural, historical, archaeological and paleontological, and aesthetic values; transportation and storage of floodwaters; prevention of erosion; and to implement the policies of the General Plan and the Local Coastal Program Land Use Plan. [Ord. 3335 § 1, 1982; Ord. 2460, 1977].

[3] On-site refers to the lands adjacent to the trail alignment, West Struve Slough and Watsonville Slough.

- Mitigation strategies, goals, objectives, planting plans, monitoring/reporting criteria, maintenance, and adaptive management developed with the City of Watsonville, County of Santa Cruz, CDFW, the Regional Board, and USFWS, and in collaboration with Watsonville Wetlands Watch.
- Replacement of all non-native tree and shrub vegetation with native, locally-sourced vegetation. The non-native tree to be removed for trail construction (at southern Struve Slough Bridge approach) will be replaced with native tree/s.
- On-going CRLF protections, including for CRLF aquatic (breeding and non-breeding), upland, refuge, movement, and dispersal habitat; monitoring, adaptive management.

The plan may include:

- In conjunction with mitigation for displaced wetlands or other sensitive habitats; creation or enhancement of off-channel breeding habitat and planting of adjacent refuge habitat with native vegetation.

Components of the CMP are further detailed in the Impacts and Mitigations Section of the main document.

During construction, take of sensitive wildlife species (CRLF, WPT, nesting birds, and roosting bats) would be avoided through implementation of protective measures: dry season construction along the CDFW Reserve, Struve Slough, and channelized Watsonville Slough; biological monitoring including environmental training of construction personnel, preconstruction surveys and implementation of protective buffers, as needed; installation of protective fencing; and other measures. During trail operation, take of sensitive wildlife species would be avoided through on-going protection of habitat, and dry season maintenance activities. These measures are detailed in the Impacts and Mitigation Section of the main document.

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1.0 INTRODUCTION

This report presents the findings of a botanical and wildlife assessment conducted by EcoSystems West Consulting Group and Bryan Mori Biological Consulting Services of the proposed Lee Road Trail Project (Project) in Watsonville, Santa Cruz County, California (**Figures 1 and 2**). The Project is a 1.43-mile-long pedestrian/bicycle path extending along Lee Road in both incorporated and unincorporated areas within the Coastal Zone.

The objectives of the botanical and wildlife assessment were to:

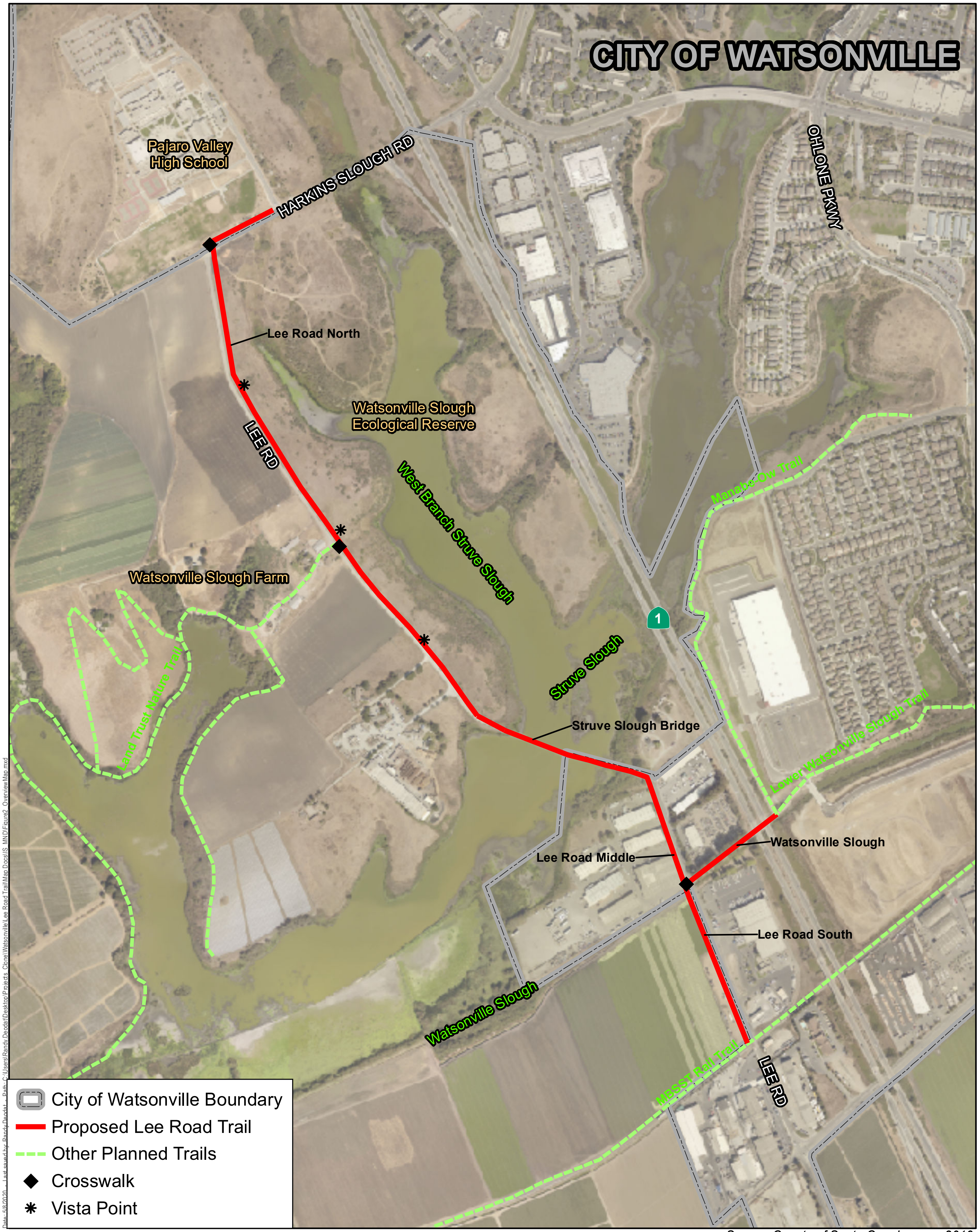
- Review relevant studies, documents, and databases, and consult with associates and agency representatives;
- Characterize, map, and evaluate the vegetation and habitat types in the Study Area including the 4.17-acre proposed Lee Road Trail Project Area;
- Identify the wildlife resources (habitats, species, and wildlife movement) in the vicinity of the larger 54.2-acre Study Area;
- Identify special-status plant and wildlife species occurring, or potentially occurring, in the Study Area;
- Summarize the results of the special-status amphibian site assessment, performed concurrently with this assessment;
- Assess potential impacts to sensitive habitat types including Environmentally Sensitive Habitat Types (ESHA) as defined by the California Coastal Act (1976) and County of Santa Cruz Local Coastal Program (LCP) (1994);
- Assess potential impacts to sensitive plant and wildlife species and wildlife movement;
- Develop best management practices and minimization measures to avoid and minimize potential impacts to sensitive biological resources, to incorporate during project design, construction, and implementation; and
- Outline the basic requirements for a conceptual mitigation plan to offset potential impacts to sensitive biological resources, to be utilized during agency consultation and permitting.

1.1 *Description of the Study Area*

The approximately 54.2-acre linear Study Area extends from near the Pajaro Valley High School driveway (near the intersection Harkins Slough Road and Lee Road), along Lee Road to the south-southeast, southeast across Struve Slough, and along Lee Road south-southeast to the railroad crossing. There is a spur trail along the channelized section of Watsonville Slough, from Lee Road through the Highway 1 underpass, connecting to the existing Manabe-Ow trail system. The Study Area includes the proposed trail, as well as two design options considered by the City, and an approximately 150-foot buffer on either side. The Study Area is mostly flat to gently sloping with a slight rise in elevation along the edge of the California Department of Fish and Wildlife (CDFW) Watsonville Slough Ecological Reserve (CDFW Reserve) near Struve Slough. In general, the trail is proposed to occur along the existing roadway and, as such, is largely within or adjacent to the developed footprint of the roadway and shoulder on the north side of Struve Slough, and within the industrial developed footprint on the south side of Struve Slough. A bridge would be constructed on the existing seasonally- to perennially-submerged Lee Road within Struve Slough.

Figure 1.

Lee Road Trail Project Area
Watsonville, California



Source: County of Santa Cruz Imagery 2016.

Harris & Associates

Figure 2

Lee Road Trail Overview

On the north side of Struve Slough, the proposed trail would begin along Harkins Slough Road at the Pajaro Valley High School driveway and then extend along the east side of Lee Road, skirting the CDFW Reserve and utilizing a proposed approximately 20-foot easement in some locations (less in others). In this area the Study Area consists of non-native grassland with encroaching coyote bush scrub transitioning to patchy coastal scrub in some locations. The CDFW Reserve and West Struve Slough lie immediately east of the proposed trail.

Agricultural fields and non-native grassland, associated with the Land Trust of Santa Cruz County's Watsonville Slough Farm, are present along the west side of Lee Road. Further southeast on the west side of Lee Road, non-native grassland and landscaping surround the Fitz Fresh Mushrooms Farm. Associated farm infrastructure, paved and dirt roads, and driveways are also present along the west side of Lee Road. A finger of Hanson's Slough and in particular the area known as Chivos Pond, extends into the agricultural fields, approximately 110 meters (360 feet) from Lee Road. The main body of Hanson's Slough is approximately 275 meters (900 feet) from Lee Road.

The proposed trail includes the Struve Slough Bridge, which would cross the seasonally to perennially-inundated Struve Slough. Here the Study Area consists of the open water and mudflats of the slough, as well as the freshwater marsh and riparian boundaries on each side of the crossing. The bridge supports would be constructed within the existing submerged portion of Lee Road; approximately one half of the existing asphalt would be removed for the project.

On the southeast side of Struve Slough, the Study Area transitions from a band of riparian habitat along the slough to a weedy ruderal area, and then to the light industrial area along Lee Road. One section along the west side of Lee Road is still in agriculture, immediately south of channelized Watsonville Slough. A eucalyptus grove lines a short span of the existing unpaved path along Watsonville Slough from Lee Road to the Hwy 1 underpass. A narrow strip of freshwater marsh and riparian vegetation is present within the channelized Watsonville Slough predominantly southwest of Lee Road.

1.2 *Project Description*

The City is proposing the Lee Road Trail Project (project) as shown in **Figure 2**. The 1.43-mile-long trail would generally be a 12-foot-wide pedestrian/bicycle trail along the east (inland) side of Lee Road, with a 12-foot-wide pedestrian/bicycle bridge over the portion of Lee Road extending through (and submerged by) Struve Slough. Additionally, portions of the trail would extend along Harkins Slough Road on the northwest end (hereafter referenced as north) and along the unpaved path located on the north side of Watsonville Slough. South of Watsonville Slough, the trail would continue along the west (coastal) side of Lee Road to the railroad crossing at the southeast end (hereafter referenced as south). Accordingly, the approximately 1.43-mile-long trail alignment is divided into the following five sections for purposes of analysis and construction phasing.

- Lee Road North
- Struve Slough Bridge
- Lee Road Middle
- Watsonville Slough
- Lee Road South

TRAIL ALIGNMENT

Lee Road North

This trail section (0.77 mile) includes the portion along Harkins Slough Road and along Lee Road to the Struve Slough crossing.

On Harkins Slough Road from the Pajaro Valley High School Driveway to Lee Road, there would be a 4- to 6-foot-wide concrete sidewalk on the north side of the road (along the high school frontage) and 5-foot-wide bike lanes added to both sides of the road. A new cross walk would be installed at the Harkins Slough Road/Lee Road intersection, crossing Harkins Slough Road on the east side of Lee Road (**Figure 2**).

The trail would continue along the east (inland) side of Lee Road extending along the Watsonville Slough Ecological Reserve owned by the California Department of Fish and Wildlife (CDFW) to the new Struve Slough pedestrian/bicycle bridge. The trail would be 8-foot-wide pervious concrete with 2-foot-wide unpaved shoulders on each side. The trail would be located adjacent to Lee Road, approximately 5 feet from the roadway until just south of the Fitz property southern driveway (which is located on the opposite side of Lee Road).

Currently, there is an existing gate on Lee Road at this location that prohibits public vehicles from accessing the submerged portion of Lee Road and Struve Slough. Here, the trail alignment would shift from east side of the roadway into the roadway. The gate would be modified to allow for the trail and still limit public vehicle access. A bollard would be installed in the path to prevent vehicles from passing. As the trail approaches Struve Slough, it would remain in the existing roadway and maintain the necessary elevation to access the Struve Slough Bridge.

As described above, the proposed project would extend along the east side of Lee Road between Harkins Slough Road and Struve Slough. However, the City, as the project applicant and responsible agency, has requested that the following design option (Option B) utilizing the west side of Lee Road also be evaluated as part of this study, in the event the City is not able to obtain an easement from CDFW to extend the trail along the east (inland) side along the edge of the Watsonville Slough Ecological Reserve.

Lee Road North - West Side Design Option B

Under this design option, the Lee Road North section would extend along the west (coastal) side of Lee Road along the Watsonville Slough Farm property owned by the Land Trust of Santa Cruz County (LTSCC), rather than the east (inland) side. At the Harkins Slough Road/Lee Road intersection, the new crosswalk would be on the west side of Lee Road instead of the east side, and the trail would continue along the west side of Lee Road until the Watsonville Slough Farm driveway. Here, the trail would cross Lee Road via crosswalk and the alignment would continue on the east (inland) side of Lee Road, as described above for the proposed project. All other aspects of the trail would be the same as described above, unless otherwise noted.

Struve Slough Bridge

This trail section (0.18 mile) includes a new 12-foot-wide, 940-foot-long pedestrian/bicycle bridge over Struve Slough. The bridge would include a concrete deck, 54-inch or higher railings on each side, and utility conduit below the deck. The bridge is intended for bicycles and pedestrians only, but would be designed to accommodate a police car and maintenance vehicle.

The bridge would be constructed with abutments on each end and up to 4 piers, installed on the previously paved original grade of Lee Road (i.e., the submerged portion of Lee Road), as shown in **Figure 3**. Approximately ½ of the asphalt of the submerged portion of Lee Road is proposed to be removed for construction of the bridge supports. The bridge would have a curve in the center to stay above the curved roadway. The bridge deck would be located approximately 16 feet above the submerged portion of Lee Road, and the underside of the bridge would be at least 1 foot above the 100-year flood elevation.

The bridge would be designed in coordination with Watsonville Wetlands Watch and CDFW to ensure it includes aesthetic compatibility and minimal intrusion in the natural slough environment.

Lee Road Middle

This trail section (0.14 mile) includes the portion along Lee Road, between the Struve Slough Bridge and the Watsonville Slough crossing. Where the trail transitions from the bridge to Lee Road, the pedestrian and bicycle traffic would be split, and a replacement gate and bollard would be installed to prevent vehicular traffic accessing the submerged portion of Lee Road and Struve Slough. There would be a new 5-foot-wide concrete sidewalk on the west side of Lee Road, and 5-foot-wide bike lanes on each side of Lee Road. The roadway would be widened westward to accommodate the new bike lane, curb and gutter, and new sidewalk – all of which would be within the City’s existing road right-of-way. A new crosswalk with signage would be installed on the north side of the Watsonville Slough crossing, so trail users could cross from the west side of Lee Road.

Watsonville Slough

This trail section (0.12 mile) includes the portion extending along the existing unpaved Lower Watsonville Slough Trail from Lee Road on the west, under Highway 1, to the convergence with the existing Manabe-Ow Trail on the east. In this area, the trail would be 8-foot-wide impervious chip seal with 2-foot-wide unpaved shoulders on each side.

Lee Road South

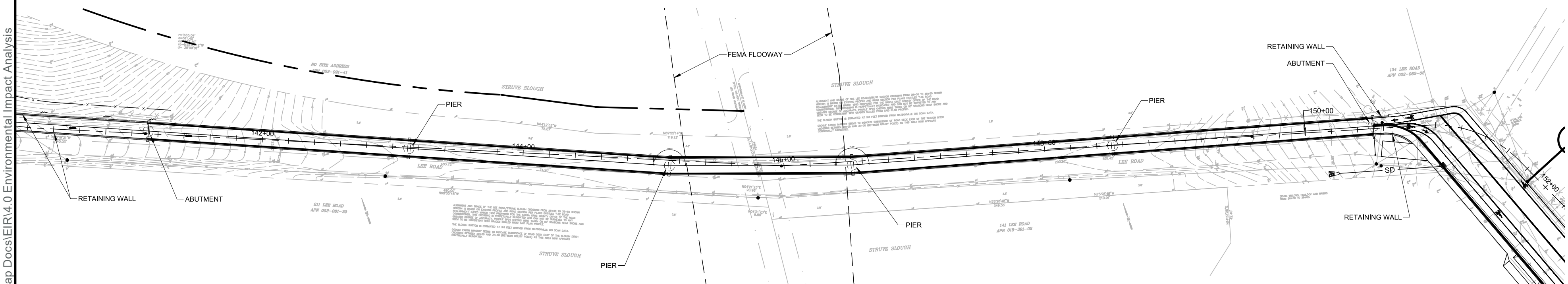
This trail section (0.20 mile) includes the portion along Lee Road from and including the Watsonville Slough channel crossing to the railroad crossing, where it would connect to the planned MBSST Rail Trail Segment 18 and existing sidewalk on the west side of the road.

The project also includes replacement of the existing 60-inch culverts where Lee Road crosses Watsonville Slough channel. The culverts need to be replaced due to age and to accommodate the sidewalk and bike lane crossings. The replacement 5-foot tall by 10-foot wide box culvert would be longer to accommodate the improvements, but it would be designed so the invert of the culvert and elevation of the roadway are consistent with the existing conditions, in order to avoid the risk of negatively impacting upstream and downstream water conveyance.

This section would be a continuation of the Lee Road Middle section. Accordingly, there would be a 5-foot-wide concrete sidewalk on the west side of Lee Road and 5-foot-wide bike lanes on each side of Lee Road. The roadway would be widened westward to accommodate the new bike lane, curb and gutter, and new sidewalk. The addition of a bike lane on the east side of this portion of Lee Road would require filling an existing drainage ditch and installing a storm drainpipe which would drain to Watsonville Slough.

Lee Road South - East Side Design Option

As a design option, the City is also considering locating the concrete sidewalk on the east side of Lee Road. The new sidewalk would be constructed above the new drainage pipe.



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Source: MME 2020.

Harris & Associates

N

0 60 120
Feet

Figure 3

Struve Slough Bridge

TRAIL DESIGN, AMENITIES AND FEATURES

ADA Accessibility

The trail would meet Americans with Disabilities Act (ADA) requirements throughout the project alignment, including the pedestrian/bicycle path portions along Lee Road, Struve Slough Bridge, and Watsonville Slough and the sidewalk portions along Harkins Slough Road and Lee Road south of the Struve Slough Bridge. There would be ADA compliant curb ramps where appropriate.

Vista Points

The trail would include up to three vista points (i.e., overlooks) along the Lee Road North section. The vista points are planned at the following locations, from north to south: 1) trail crest 1,000 feet south of Harkins Slough Road, 2) trail crest across from the Watsonville Slough Farm driveway entrance where a crosswalk with signage would be installed to cross Lee Road and access the planned trails in Watsonville Slough Farm, and 3) trail crest near the Fitz property north driveway before the trail descends toward Struve Slough (**Figure 2**).

In these areas, there would be a pull-out that is approximately 6 feet by 6 feet with educational/interpretive signage and trash and recycling bins. The signage would be developed by Watsonville Wetlands Watch in coordination with CDFW and LTSCC, and it would include educational information about the Watsonville Slough Ecological Reserve, Watsonville Slough Farm, natural resources, agricultural resources, and history of the area. It would also include trail use guidelines and restrictions (described under Trail Operations and Maintenance). There would likely be signage at the north end near the Harkins Slough Road crossing, although there may not be adequate space for a pull-out.

Under the ***Lee Road North - West Side Design Option B***, the two northern vista points would be at similar locations, but along the trail alignment as it extends along the west side of Lee Road. The third vista point would be at the same location as the proposed project on the east side of the road.

Fencing

Fencing would be installed in the Lee Road North section where the trail is adjacent to the Watsonville Slough Ecological Reserve to encourage trail users to stay on the trail and outside the CDFW Reserve, which can be accessed at the north end near Harkins Slough Road with permission. The fencing would allow wildlife movement.

Additionally, there would be guard railing made of steel rails and steel pickets on the elevated Struve Slough Bridge section for trail user safety and slough protection.

Under the ***Lee Road North - West Side Design Option B***, the fencing would be similar and installed alongside the trail as it extends along the west side of Lee Road to encourage trail users to stay on the trail and outside private property.

TRAIL OPERATIONS AND MAINTENANCE

Trail Users

The trail is estimated to have a total of up to approximately 225 users per day, with 25 bicyclists and 200 pedestrians[4], throughout the week with full buildout of the project (i.e., when all trail sections are constructed and operating), as well as the planned LTSCC Watsonville Slough Farm trail system, City Trail & Bicycle Master Plan, and Monterey Bay Sanctuary Scenic Trail network . On weekdays, the users would be predominately high school students accessing Pajaro Valley High School located on Harkins Slough Road. On weekends, the users would be predominately recreationists.

The project does not create new parking areas. It is anticipated that trail users would originate from other trail connections and locations in the City, although weekend users may park along the Lee Road shoulders. Additionally, at the north end, users may park along Harkins Slough Road, in the Pajaro Valley High School Parking lot when the gates are open, or in the future parking area on LTSCC property once it is constructed as part of the Watsonville Slough Farm trail system. On the south end, additional parking may become available in the parking lot at the hotel/shopping center being constructed at Lee Road near West Beach Street.

Trail Operation

Hours. Trail usage would be limited to daylight hours, from dawn to dusk. The hours would be posted on trail signage. No trail access gates are proposed to close the trail.

Electric Bicycles. The ADA-accessible trail is intended for pedestrians and bicyclists. In accordance with Assembly Bill (AB) 1096, Class 1 and Class 2 e-bikes are legal on any paved surface that a regular bike is allowed to operate[5]. Electronic skateboards with a rating limited to 20 miles per hour would be allowed as well. Depending on the volume of users, other speed limits may be imposed and indicated on posted signage.

No Dogs/No Smoking. In accordance with CDFW guidance, there would be no dogs and no smoking allowed on the trail extending along CDFW property. Dogs may be allowed on leash on other portions of the trail. These restrictions would be included on trail signage and would also apply to the Lee Road North West Side Design Options.

Lighting. There would be no trail lighting to protect the sensitive biological resources in the Watsonville Slough Ecological Reserve. However, there are existing streetlights along the Lee Road Middle and Lee Road South sections. Additional lighting may be included along these sections and along the Watsonville Slough Trail section extending beneath Highway 1 for security. Additionally, low-level, low-profile lighting may be considered on the bridge subject to California Coastal Commission requirements and approval.

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[4] The Watsonville Public Works & Utilities Department used two methods to estimate trail use. One was the method used in the Santa Cruz County Regional Transportation Commission's Trails Master Plan, which assumed that the trail was a park and assigned a trip generation rate per acre. The other method was to use mode splits for automobile, bicycles and pedestrians from data collected for six Watsonville intersections. The mode split data was also used to determine the number of bicycles and pedestrians, considering Watsonville has very few bicycle riders.

[5] As defined in AB 1096, a Class 1 e-bike, or low-speed pedal-assisted electric bicycle, is equipped with a motor that aids only when the rider is pedaling and that stops providing assistance when the bicycle reaches 20 miles per hour (mph). Class 2 e-bikes, or low-speed throttle-assisted electric bicycle, but that cannot provide assistance when the bike reaches 20 mph. A Class 3 e-bike, or speed pedal-assisted electric bicycle, is equipped with a motor that provides assistance only when the rider is pedaling and stops providing assistance when the bicycle reaches 28 mph. Operators of Class 3 e-bikes must be 16 or older and wear a helmet. Class 3 e-bikes are prohibited from Class I multi-use bike paths unless specifically authorized by a local ordinance.

All additional lighting installed on the proposed Struve Slough Bridge and along channelized Watsonville Slough would be wildlife-friendly (directed downward and away from aquatic features).

Security. The City of Watsonville Police Department and County of Santa Cruz Sheriff's Office would routinely patrol portions of the trail within their respective jurisdictions for safety, in addition to the bi-weekly monitoring for train maintenance described below. This includes monitoring for loitering, encampments, and illegal activity along the public trail. Additionally, the County would post "no parking" or "limited parking" (no nighttime parking) signs along Lee Road in the Lee Road North section. Initially, the signs would be posted on the trail side where there is no room for parking for safety because the trail is only five feet from the road. Parking restrictions would be increased as necessary (e.g., on both sides of the road) due to public nuisance for safety and security.

Trail Maintenance

The trail would be operated and maintained as a joint effort by the City and County public works departments. Routine trail maintenance activities would include the following.

- Bi-weekly monitoring. This would involve a small vehicle which would drive and park along Lee Road and Harkins Slough Road and access the trail on foot to check for necessary maintenance activities, as listed below.
- Trash and recycling collection and disposal on a monthly basis or more often if needed.
- Tree and shrub trimming, fallen tree removal, shoulder grass mowing, and weed removal (near the sloughs, these activities would occur during the dry season, typically April 15 to October 15)
- Path repair and maintenance
- Graffiti removal
- Fence repair and replacement
- Signage repair and replacement
- Drainage inspection and cleaning

TRAIL CONSTRUCTION

Table 1 provides a summary of the trail dimensions and estimated construction timeframe, earth disturbance, and new impervious surface.

Timeframe and Phasing

The 1.43-mile trail is comprised of five sections, which would be constructed in three phases planned as follows.

- Phase 1 (2021-2022): Lee Road North with 6-month duration.
- Phase 2 (2023-2024): Struve Slough Bridge, Lee Road Middle, and Watsonville Slough with 12-month duration beginning two years after Phase 1, and segments constructed in sequence to minimize construction traffic in the project area.
- Phase 3 (2025-2026): Lee Road South with 9-month construction duration beginning two years after Phase 2.

Construction near the Watsonville Slough Ecological Reserve, Struve Slough, and Watsonville Slough would occur during the dry season, from April 15 to October 15.

The hours of construction activities would be limited to between 7:00 a.m. to 7:00 p.m., Monday through Saturday, excluding holidays. Construction within the County jurisdiction would be limited to the hours of 8:00 a.m. to 5:00 p.m. during weekdays only, or an advanced authorization obtained for extended hours. Construction traffic on Harkins Slough Road may be adjusted to avoid the morning school commute times.

Table 1. Proposed Lee Road Trail Project Characteristics and Construction Estimates

Information	Lee Road North	Struve Slough Bridge	Lee Road Middle	Watsonville Slough	Lee Road South
		Project Characteristics			
Trail Length (1.43 miles)	0.77 mile	0.18 mile	0.14 mile	0.12 mile	0.20 mile
Trail Width and Description	Harkins Slough Rd (0.10 mile): 4-6' wide concrete sidewalk with 5' wide bike lanes along roadway Lee Rd (0.67mile): 8' wide pervious concrete multiuse path with 2' wide unpaved shoulders	12' wide concrete multiuse bridge deck with up to 4 piers	5' wide concrete sidewalk with 5' wide bike lanes along roadway	8' wide chip seal (1) multiuse path with 2' wide unpaved shoulders	5' wide concrete sidewalk with 5' wide bike lanes along roadway, including Watsonville Slough culvert
New impervious surface	0.74 acre	0.33 acre	0.04 acre	0.12 acre	0.36 acre
		Construction Estimates			
Construction Phasing	2021/2022 Phase 1	2023/2024 Phase 2	2023/2024 Phase 2	2023/2024 Phase 2	2025/2026 Phase 3
Construction Duration	6 months	6 months	3 months	3 months	9 months
Excavation Depth	Up to 18"	Up to 125 feet for bridge pilings	Up to 18"	Up to 12"	Up to 18"
Estimated Total Disturbance Area	2.17 acres	0.58 acres	0.24 acres	0.18 acres	0.36 acres
Excavation/Exported (2)	1,490 CY	400 CY	510 CY	32 CY	670 CY
Material Imported:					
Aggregate Base	760 CY	80 CY	250 CY	290 CY	490 CY
Pavement	120 CY	12 CY	70 CY	0	100 CY
Concrete	45 CY	310 CY	82 CY	0	500 CY
No. 57 Stone	500 CY	0	0	0	0
Pervious Concrete	500 CY	0	0	0	0
Chip Seal	0	0	0	570 SY	0

(1) Chip seal, which is comprised of a layer of base rock and coating of oil with chip in it, is the City's typical standard for trail construction. The unpaved shoulders are typically smaller rock, like gravel.
(2) Excavated materials would be used on site to the extent practicable, but the environmental analysis assumes all would be exported offsite to provide for a worst-case analysis.

General Methodology

Overall, construction activities for the project would include clearing, grading, placement of aggregate base and concrete or pavement, and native revegetation where vegetation was removed.

All Trail Sections (except Struve Slough Bridge). The disturbance corridor for construction activities is estimated to be 20 feet wide along the trail alignment. In the Lee Road Middle and Lee Road South sections, construction activities would occur on both sides of the roadway and would all be within the existing public road right-of-way. Excavation depth would be 12 to 18 inches.

Large construction equipment would include trail dozers, skid steers, narrow track loaders, rollers, and vibrating plate compactors. Specialized narrow-width equipment is anticipated to be used in areas where minimization of the width of construction impact is a priority. Hand excavation may be required in limited areas where the trail may cross within the dripline of trees or other sensitive resources.

Struve Slough Bridge Section. Bridge construction would include abutments on each end and up to 4 piers installed up to 125 feet deep below the existing submerged paved roadway. The eastern lane (approximately 50 percent) of the submerged asphalt roadway would be removed to accommodate the piers, and the western lane would be retained in place so utility providers have access to the existing utility poles. Anticipated equipment includes drill rigs, cranes, excavators, and dump trucks. There would be drilling but no pile driving. In order to protect water quality and facilitate construction, temporary dewatering of Struve Slough would occur for up to 3 to 4 months during the dry season (April 15 to October 1). Clean gravel with passive gravity culverts would be placed on top of the existing road pavement. Some pumping would be required for pier drilling.

Watsonville Slough. For work within channelized Watsonville Slough at the culverts under Lee Road, in order to protect water quality and facilitate construction, temporary dewatering is required. Temporary sandbag dams will be installed at each end to isolate the slough from the construction site. A screened pump diversion system would be used to divert low flows around the construction site. A diversion would be necessary due to the tight physical constraints and the need to maintain vehicular access along Lee Road during construction. Temporary dewatering would take place during the dry season (between April 15 and October 1) for up to 2 to 3 months.

Utilities

Utilities, including utility poles and aerial lines, storm drains and any buried utilities, would remain in place undisturbed, with the exception of the storm drain culverts and ditch improvements in the Lee Road South section. Additionally, there are two locations where the buried gas main would be relocated, including approximately 1,200 linear feet along the southern approach to Struve Slough and 200 feet at the Watsonville Slough culvert.

The new bridge over Struve Slough would include utility conduits so that overhead poles and wires currently extending along the submerged portion of Lee Road could be removed in the future. Any potential disruption to service would be coordinated in advance with service providers.

Drainage and Culvert Improvements

In general, the existing drainage patterns would be retained as runoff would sheet flow across the Trail surface to adjacent pervious areas and existing swales or drainage facilities. In some locations, there would be alterations to existing facilities to accommodate the proposed trail. Proposed altered and new drainage features along the trail alignment include the following by trail section from north to south. With these project features, the project should be exempt from stormwater regulation in accordance with the RWQCB guidelines.

Lee Road North. Currently, stormwater runoff flows along the north side of Harkins Slough Road, between Pajaro Valley High School driveway and Lee Road. A vegetated swale would be developed adjacent to (upslope from) this location to accommodate the sidewalk and direct stormwater runoff away from the sidewalk and road. Sheet flow from the sidewalk would drain north into the proposed swale and existing catch basin that flows under Harkins Slough Road and onto vegetated open space land on the south side of the road. The bike lane, curb, and gutter would connect to this existing catch basin as well. Near the high school driveway, an existing storm drain inlet would be relocated and a new storm drain added, connecting to an existing storm drain pipeline.

Additionally, at the south end of the Lee Road North section (beginning between Stations 135 and 136), a drainage swale (bioswale) would be constructed immediately upslope (northeast) of the trail. The function of the swale would be to capture and convey surface run-off to a rock-lined infiltration basin north of the Struve Slough Bridge approach.

Lee Road Middle. New storm drainage facilities would be installed on the southwest side of the new Struve Slough Bridge to control drainage. There would be a storm drain inlet in the new curb and gutter to convey stormwater to a buried pipeline (approximately 3 feet deep), extending approximately 150 feet to an outfall with a rock dissipater in a vegetated area on the south side of Struve Slough.

Additionally, new storm drainage facilities would be installed on the northwest side of the Watsonville Slough channel and new crosswalk. There would be stormdrain inlet in the new curb and gutter to convey stormwater to a buried pipeline (approximately 3 feet deep), extending approximately 50 feet to an outfall with a rock dissipater on the north side of the Watsonville Slough channel.

Lee Road South. As described in the Watsonville Slough section above, the project includes replacement of the existing culverts (two 60-inch-diameter pipes), where Lee Road crosses Watsonville Slough channel, with a box culvert (approximately 5 feet tall by 10 feet wide). The replacement culvert would be longer than the existing culverts, but it would be designed so the invert of the culvert and elevation of the roadway are consistent with the existing conditions, in order to avoid the risk of negatively impacting upstream and downstream water conveyance. For work within channelized Watsonville Slough, in order to protect water quality and facilitate construction, temporary dewatering is required. Temporary sandbag dams will be installed at each end to isolate the slough from the construction site. A screened pump diversion system would be used to divert low flows around the construction site. A diversion would be necessary due to the tight physical constraints and the need to maintain vehicular access along Lee Road during construction. Temporary dewatering would take place during the dry season (between April 15 and October 1) for up to 2 to 3 months.

Additionally, the existing non-jurisdictional drainage ditch (bare earth, degraded with some weedy vegetation) along the inland/east side of Lee Road, south of the Watsonville Slough channel, would be converted to a pipe so the roadway could be widened to accommodate the new bike lane. The new curb and gutters would have storm drain inlets to the pipe, which would convey stormwater northward to Watsonville Slough ditch, similar to the existing ditch. On the coastal/west side of Lee Road, a bioswale would be constructed to capture stormwater runoff from the sidewalk and bike lanes and convey it to the Watsonville Slough ditch.

Construction Staging

Construction staging areas would be located on existing pavement and disturbed areas within the road right-of way where there is adequate room to support construction vehicles and/or materials. Staging areas would not extend into private property without prior agreements and would be at least 50 feet away from any waters, drainages or the Ecological Reserve. Where this separation cannot be achieved, appropriate protections would be provided and maintained in accordance with permit requirements. Following project implementation, the staging areas and all affected areas within the project area would be returned to pre-project conditions.

BEST MANAGEMENT PRACTICES

The following best management practices (BMPs) would be implemented during project construction to protect natural resources and comply with agency guidelines, requirements, laws and regulations. These measures would be included in the construction specifications and implemented by the construction contractors and professionally qualified staff, as required.

The City or County would perform routine inspections of the construction area to verify the BMPs are properly implemented and maintained. The City or County would notify the contractor immediately if there was a violation that would require immediate compliance.

Air Quality. The following BMPs would be implemented in accordance with the Monterey Bay Air Resources District's recommendations for the control of short-term construction generated emissions.

- Water all active construction areas at least twice daily as necessary and indicated by soil and air conditions.
- Prohibit all grading during periods of high wind (over 15 mph).
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days)
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed areas.
- Haul trucks shall maintain at least 2' 0" freeboard.
- Cover all trucks hauling soil, sand, and other loose materials.
- Plant native vegetative ground cover in disturbed areas as quickly as possible.
- Cover inactive storage piles.

Biological Resources. The following measures would be implemented to protect natural resources associated with the sloughs and drainages.

- Construction near the Watsonville Slough Ecological Reserve, Struve Slough, and Watsonville Slough will occur during the dry season.
- Construction fencing will be erected to limit construction impacts to sensitive resources, such as areas along the Watsonville Slough Ecological Reserve, Struve Slough, Watsonville Slough, and any existing trees. In undisturbed areas as much as practical, the construction zone would be limited to a 20-foot corridor to minimize impacts to habitat and wildlife.

Water Quality. The following measures would be implemented in accordance with the *County of Santa Cruz Construction Site Stormwater Pollution Control BMP Manual (October 2011 edition),* to control erosion, sediment and stormwater pollution.

- Storm drain inlets will be protected with sandbags or other comparable containment or filter berms and barriers.
- Sandbags and/or straw bales will be installed around the perimeter of construction and staging areas.
- All surplus asphalt and rubble will be removed from the project area and transported to the local landfill or approved disposal site.

2.0 METHODS

2.1 *Review of Literature and Data Sources*

EcoSystems West botanists reviewed literature and special-status species databases to identify sensitive habitats, plants and wildlife species with potential to occur in the Study Area. Sources consulted include:

- CNDDB occurrence records (2020a) and resource maps from the Biogeographic Information and Observation System (BIOS) (CNDDB 2020b) for the Watsonville West USGS 7.5-minute quadrangle and (for plants) seven surrounding quadrangles;
- USGS quadrangle occurrence records in the California Native Plant Society's (CNPS) *Online Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2020) for the Watsonville West quadrangle and the seven surrounding quadrangles;
- Local and regional floras (Thomas 1961; Munz and Keck 1973; Hickman 1993; Baldwin *et al*. 2012);
- Local regional experts on sensitive wildlife species; and
- Other literature and databases that contained sensitive wildlife species lists for the vicinity, such as ebird (2020).

Sources consulted for current agency status information include U.S. Fish and Wildlife Service (USFWS) (2020a,b,c) for federally-listed species (including federal Proposed and Candidate species), and California Department of Fish and Wildlife (CDFW) (2019a; 2020a,b) for state species listed as 'Threatened' or 'Endangered' or as 'Species of Special Concern' and those species state ranked by NatureServe as critically imperiled, imperiled, and vulnerable (Faber-Langendoen 2012, CDFW CNDDB 2020).

For special-status plants, we reviewed the CNPS *Inventory* (Tibor 2001; CNPS 2020): List 1A (Plants Presumed Extinct in California), List 1B (Plants Rare, Threatened, or Endangered in California and Elsewhere), or List 2 (Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere). We also reviewed List 3 (Plants About Which We Need More Information -- A Review List) and List 4 (Plants of Limited Distribution -- A Watch List) of the CNPS *Inventory*[6] (Tibor 2001; CNPS 2020).

For wildlife species, we reviewed the USFWS list of *Birds of Conservation Concern* (BCC) (USFWS 2008)[7] and the list of bat species considered 'High Priority' by the Western Bat Working Group (WBWG) (2020).

These plant and wildlife species fall under the provisions of the California Environmental Quality Act (CEQA) Guidelines. Based on information from the above sources, we developed target lists of special-status plants (**Appendix A**) and wildlife species (**Appendix B**) with potential to occur in the vicinity of the Study Area.

This preliminary assessment followed CDFW (CNDDB 2020a,b) and other standard survey protocols. We reviewed distribution information for sensitive species to determine which species would have the potential to occur in or near the alignments and which species could be eliminated from consideration, based on soils, vegetation and habitat types in the alignments and surroundings, locations of known occurrences, dispersal distances (for wildlife), and professional knowledge of the region and local sensitive species.

[6] List 3 and List 4 plant species are considered to be of lower sensitivity, and generally do not fall under specific state or federal regulatory authority. Specific mitigation considerations are generally not required for species in these last categories (Tibor 2001; CNPS 2018).

[7] BCC are migratory nongame birds of concern because of (1) documented or apparent population declines, (2) small or restricted populations, and (3) dependence on restricted or vulnerable habitat (USFWS 2008).

2.2 *Field Visits*

BOTANY

An EcoSystems West plant ecologist conducted a wetland assessment and focused rare plant surveys of the Study Area based on site visits in June 2019 and May 2020. The entire Study Area was thoroughly evaluated during field surveys. All vascular plant species in identifiable condition on the survey dates were identified to species or infraspecific taxon, regardless of their regulatory status. The identifications were facilitated by the use of keys and descriptions in Thomas (1961); Munz and Keck (1973); Hickman (1993); and Baldwin et al. (2012). The timing of the assessment was adequate for identification of most of the special-status species listed in **Appendix A**. Species with flowering periods earlier or later than the June survey period would have been identifiable by vegetative characteristics or the Study Area did not support suitable habitats and/or edaphic and hydrologic conditions. Specifically, Santa Cruz tarplant (*Holocarpha macradenia*; FE, CNPS List 1B.2) has not been observed during numerous recent focused surveys within the CDFW Watsonville Sloughs Reserve. An attempt to reintroduce this species to the Reserve in the early 1990s was unsuccessful.

The EcoSystems West plant ecologist characterized and mapped all habitat types, including wetlands, occurring within the Study Area. We also recorded data on physiognomy, dominant and characteristic species, topographic position, slope, aspect, substrate conditions, hydrologic regime, and evident disturbance for each habitat type. In classifying the habitat types on the site, we consulted the generalized plant community classification schemes of Holland (1986); Sawyer et al. (2009); and CDFW (2020d). Our final classification and characterization of the habitat types of the Study Area was based on field observations.

WILDLIFE

EcoSystems West wildlife biologists conducted site visits in June and September 2019 and May 2020. Our objective during these visits was to assess and identify potential habitat for the special-status species listed in **Appendix B** following standard survey techniques for each species.

Amphibians and Reptile Assessment

Bryan Mori Biological Consulting Services and EcoSystems West Consulting Group conducted assessments of potential upland, dispersal, movement, and aquatic habitats (if present) for those species listed in **Appendix B**.

Surveys followed the methods outlined in agency protocols to conduct habitat site assessments for federally-listed amphibians: Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*) (USFWS and CDFW 2012), California tiger salamander (*Ambystoma californiense*) (USFWS and CDFW 2003), and California red-legged frog (*Rana draytonii*) (USFWS 2005). Biologists evaluated potential habitats along the alignment and reviewed occurrence records within agency-designated radii for each species. With this information, biologists determined the likelihood of amphibians to utilize or move through the property from nearby known locations. Formal protocol-level surveys were not conducted as part of this effort.

EcoSystems West biologists also evaluated the site for the Santa Cruz black salamander (*Aneides niger*) and for the western pond turtle (*Actinemys pallida = Emys marmorata*).

Raptors/Bird Assessment

Special-status avian species that may occur in the vicinity of the property are included in **Appendix B**. EcoSystems West biologists evaluated the Study Area and reviewed distribution and occurrence data to determine which raptors and avian species could potentially nest on the site and which species could be eliminated from consideration. For certain bird species (such as those listed as "Fully Protected") we also considered wintering and foraging activities.

We conducted avian surveys during June 2019 and May 2020 to determine which special-status and common bird species were utilizing the Study Area. We selected observation points and documented observations, including foraging, courtship displays, and breeding behavior by birds/raptors in the Study Area. A comprehensive breeding bird survey was not performed because nest sites for most avian species are dynamic and nest locations vary from year to year.

Mammal Assessment

EcoSystems West biologists evaluated the Study Area for special-status bat roost features. We visually inspected the tree stands for potential roost features or evidence of bats (e.g., tree cavities, senescent limbs, peeling bark, or guano deposition) (Brown et al. 1996). EcoSystems West documented potential and occupied habitat for the San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), including stick nest structures on the ground or in trees, scrub, and the understory of woodland habitat.

3.0 REGULATORY BACKGROUND

Federal, state, and local regulations have been enacted to provide for the protection and management of sensitive biological and water resources. Those pertinent to the Project are summarized below.

3.1 Federal Regulations

FEDERAL ENDANGERED SPECIES ACT

The provisions of the federal Endangered Species Act (ESA) of 1973 (Title 16 United States Code, Section 1531 *et seq*., as amended) protect federally-listed Threatened and Endangered species and their habitats from unlawful "take."[8] Activities that may result in "take" are regulated by the USFWS for terrestrial federally-listed species. Listed species are taxa for which proposed and final rules have been published in Federal Register (USFWS 2020a, 2020b). Candidate species are not afforded any legal protection under the federal ESA but typically receive special attention from federal and state agencies during the environmental review process (USFWS 2020c).

The federal ESA or its implementing regulations do not prohibit take of listed plant species. However, federal agencies cannot undertake activities that would jeopardize the continued existence of a threatened or endangered plant. In addition, the removal of threatened or endangered plants may be a violation of the federal ESA under certain circumstances, if the action is not in compliance with state law.

For projects with a with federal involvement (i.e., funded, authorized, or carried out by a Federal agency), permits for "take" may be obtained through coordination and interagency consultation with the USFWS

[8] Section 3(18) of the FESA defines "take" to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Service regulations (50 Code of Federal Regulations [CFR] 17.3) define "harm" to include significant habitat modification or degradation that actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. "Harassment" is defined by USFWS as an intentional or negligent action that creates the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

pursuant to Section 7. Designated "Critical Habitat" for plants or animals, determined and published in the Federal Register as a formal rule, also receives protection under Section 7 of the ESA.

For actions with no federal nexus, consultation with USFWS Fisheries takes place under 10(a)(1)(B) of the federal ESA.

MIGRATORY BIRD TREATY ACT

All migratory birds and their nests are federally protected under the Migratory Bird Treaty Act of 1918 (MBTA) (Title 16 United States Code, Section 703-712 as amended; 50 Code of Federal Regulations Section 21; and 50 CFR Section 13) (and by California Department of Fish and Game Code provisions that support the act). The MBTA makes it unlawful to "take" any migratory bird or raptor listed in the 50 CFR Section 10, including their nests, eggs, or products.

BIRDS OF CONSERVATION CONCERN

The USFWS *Birds of Conservation Concern* (BCC) (USFWS 2008) was developed to fulfill the mandate of the 1988 amendment to the Fish and Wildlife Conservation Act [Public Law 100-653 (102 Statute 3825)] to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the FESA" and to stimulate coordinated and proactive conservation actions among federal and state agencies and private entities. The bird species included on the BCC lists include "nongame birds, gamebirds without hunting seasons, and Endangered Species Act candidates, proposed endangered or threatened, and recently delisted species" that USFWS considers to be of concern in the U.S. because of (1) documented or apparent population declines, (2) small or restricted populations, or (3) dependence on restricted or vulnerable habitats. Species on this list fall under the authority of Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds" (Federal Register, vol. No, 11, January 17, 2001). These species typically meet the criteria of the CEQA Guidelines and are considered during environmental review.

BALD EAGLE PROTECTION ACT

The Bald Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250) as amended, provides for the protection of the bald eagle and the golden eagle by prohibiting the taking, possession, and commerce of such birds, their eggs, and their nests except under certain specified conditions. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

EXECUTIVE ORDER 13112 - INVASIVE SPECIES

This order enlists federal agencies to prevent the introduction of invasive species, provide for their control and minimize the economic, ecological, and human health impacts that invasive species cause. In addition, federal agencies are required, when feasible, to restore native species and ecosystems and promote public awareness about invasive species.

WETLANDS AND WATERS OF THE U.S.

Wetlands are defined by the USACE as, "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (EPA, 40 CFR 230.3, and CE 33 CFR 328.3).

The USACE uses three criteria to delineate wetlands: the presence of (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils. According to the USACE Manual, evidence of at least one positive wetland indicator from each parameter must be found in order to make a positive determination.

Areas that are inundated for sufficient duration and depth to exclude growth of hydrophytic vegetation, such as lakes and ponds, or convey water, such as streams, are considered "other waters." Along the central California coast, these other waters can include intermittent and ephemeral streams, as well as lakes and rivers. Other waters are identified by the presence of an ordinary high-water mark[9], a defined river or stream bed or bank, or by the absence of emergent vegetation in ponds or lakes.

Wetlands and other waters of the U.S., including streams, ponds and lakes, are regulated by the USACE and the Regional Water Quality Control Board (RWQCB) under Sections 401 and 404 of the Clean Water Act.

Federal Clean Water Act (Section 404)

Under Section 404 of the Clean Water Act, the USACE is responsible for regulating the discharge of fill material into waters of the U.S. The term "waters" includes wetlands and other waters that meet specific criteria as defined in the CFR (EPA, 40 CFR 230.3, and CE 33 CFR 328.3). In general, a permit must be obtained before fill can be placed in wetlands or other waters of the U.S. The type of permit depends on the amount of acreage and the purpose of the proposed fill, subject to discretion of the USACE.

Federal Clean Water Act (Section 401)

Section 401 of the Clean Water Act (CWA) assigns overall responsibility for water quality protection to the State Water Resource Control Board and directs the nine statewide RWQCBs to develop and enforce water quality standards within their boundaries. A 401 Certification is required from the RWQCB whenever improvements are made within Jurisdictional Waters of the U.S.

Executive Order 11990

Executive Order 11990 (42 FR 26961, 3 CFR, 1977 Comp., p. 121) mandates that federal or federally assisted projects and programs minimize the destruction, loss, or degradation of wetlands and avoid new construction in wetlands, taking into account public health and safety, maintenance of natural systems, and other public interests.

3.2 *State Regulations*

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Based on provisions of Section 15380 of the *CEQA Guidelines*, plants and animals with the following protected status may be addressed in CEQA documents on proposed development projects: federally-listed Endangered or Threatened species under the FESA, federal Proposed and Candidate species, and species listed by the state of California as Endangered, Threatened, or Rare under the California Endangered Species Act (CESA) or California Native Plant Protection Act (NPPA).

[9] An ordinary high water mark is defined as the natural line on the shore established by fluctuations of water.

In addition, under Section 15380(d) of the *CEQA Guidelines*, a species not included on any list recognized by the state "shall nevertheless be considered rare or endangered if the species can be shown to meet the criteria" for listing. The CDFW, USFWS, and U.S. Forest Service all maintain independent lists of species with designated conservation status that meet the *CEQA Guidelines* criteria for consideration. Based on provisions of Section 15380(d) of the *CEQA Guidelines*, lead agencies, in making a determination of impact significance, typically treat non-listed plant and animal species as equivalent to listed species if the non-listed species satisfy the minimum biological criteria for listing. In assigning "impact significance" to populations of non-listed species, analysts generally consider factors such as population-level effects, proportion of the taxon's range affected by a project, regional effects, and impacts to habitat features. CDFW recommends considering these species during analysis of proposed project impacts to protect declining populations, and to avoid the need to list them as threatened or endangered in the future. The CEQA Guidelines direct lead agencies to consider impacts of the proposed project on individual animals, communities, populations, range, and habitat of species that meet the CEQA criteria.

The CEQA Guidelines also direct project proponents to assess and mitigate for impacts to sensitive natural communities identified in local or regional plans, policies, regulations or by the CDFW or USFWS, including wetlands.

In addition, the CEQA Guidelines include consideration of substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or the use of native wildlife nursery sites.

Finally, CEQA requires that local policies or ordinances protecting biological resources, Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plan be considered during environmental review.

CALIFORNIA ENDANGERED SPECIES ACT

The California Endangered Species Act (CESA) protects native plant and animal species (and their habitats) "in danger of, or threatened with, extinction because their habitats are threatened with destruction, adverse modification, or severe curtailment, or because of overexploitation, disease, predation, or other factors" (California Fish and Game Code [CFGC] 1984, Section 2050-2116). The CESA prohibits the "take"[10] of state-listed endangered, threatened, and candidate species. The CDFW maintains lists of Endangered, Threatened, and Rare plants (CDFW 2020a) and Endangered and Threatened animals (CDFW 2020b), as designated by the California Fish and Game Commission and under the California Native Plant Protection Act (NPPA)(1977). The Habitat Conservation Planning Branch of CDFW administers the state's rare species program. In addition to recognizing three levels of endangerment, CDFW can afford interim protection to candidate species while the California Fish and Game Commission reviews them. Habitat degradation or modification is not expressly included in the definition of "take" under the CFGC, but CDFW has interpreted "take" to include the "killing of a member of a species which is the proximate result of habitat modification."

CALIFORNIA NATIVE PLANT PROTECTION ACT

The California NPPA (CFGC Section 1900 - 1913) was enacted in 1977 and allows the California Fish and Game Commission to designate plants as rare or endangered. The NPPA limits the circumstances in which endangered or rare native plants may be taken. Project permitting and approval requires compliance with NPPA.

[10] The CESA defines "take" as hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill (CFGC Section 86).

California Native Plant Society Inventory

The CNPS prepares and regularly updates an *Inventory of Rare and Endangered Vascular Plants of California*. In general, CDFW qualifies for legal protection under CEQA those plant species on List 1A (Plants Presumed Extinct in California), List 1B (Plants Rare, Threatened, or Endangered in California and Elsewhere) or List 2 (Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere) of the CNPS *Inventory* (CNPS 2005, 2020). Species on CNPS List 3 (Plants About Which We Need More Information--A Review List), or List 4 (Plants of Limited Distribution--A Watch List) are considered to be of lower sensitivity, and generally do not fall under specific federal or state regulatory authority. Specific mitigation considerations are not generally required for species in these two categories.

Species of Special Concern

The CDFW maintains a list of animal "Species of Special Concern," most of which are species whose breeding populations in California may face complete destruction or extirpation (Bolster 1998, Shuford and Gardali 2008, Moyle et al. 2015, Thompson et al. 2016, CDFW 2020c, CDFW CNDDB 2020). Although these species have no legal status under the CESA, CDFW recommends considering these species during analysis of proposed project impacts to protect declining populations, and to avoid the need to list them as threatened or endangered in the future. These species may "be considered rare or endangered [under CEQA] if the species can be shown to meet the criteria."

California Fish and Game Code and California Code of Regulations

California Fish and Game Code (CFGC) protects the active nests and eggs of birds from take, possession, or needless destruction (3503), and prohibits the take, possession, or destruction birds of prey (orders Falcinoformes and Strigiformes) and their eggs and nests (3503.5). The CFGC (Sections 86; 2000; 2002; 2014; 3000-3012; 4150) and several sections under Title 14 of CCR protect non-listed bat species and their roosting habitat, including individual roosts and maternity colonies (14 CCR Section 472). Section 86 of CFGC generally defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Other CFGC sections prohibit the willful take, capture, confinement, possession, or destruction of particular wildlife species, including bats and other non-game mammals. The CCR Title 14 provisions prohibit the take of nongame birds and mammals.

Fully Protected Species

The CFGC contains lists of vertebrate species designated as "Fully Protected" (CFGC 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], and 5515 [fish]). This classification was the state's initial effort in the 1960's to identify and provide protection to those animals that were rare or faced possible extinction. Fully Protected species generally may not be taken or possessed at any time and no licenses or permits may be issued for their take except pursuant to an approved Natural Community Conservation Plan (NCCP) or for relocation of bird species, the protection of livestock, or the collection of those species necessary for scientific research. Impacts on these species are also considered under CEQA.

Western Bat Working Group Lists

The WBWG maintains a region-by-region matrix of the status of bat species throughout their western North American range. Bats that are designated as "High Priority" by the WBWG are "imperiled or are at high risk of imperilment" based on available information on distribution, status, ecology, and known threats (WBWG 2018). Bats may also be designated as medium-or low-priority. These designations are included on CDFW's Special Animals list of sensitive wildlife species (CDFW CNDDB 2020). High Priority bat species qualify for legal protection under Section 15380(d) of the *CEQA Guidelines*.

SENSITIVE HABITATS

Sensitive habitats include CDFW Sensitive Natural Communities (rank of S1 – S3), riparian corridors,[11] wetlands, and habitats for species that are protected under FESA, CESA, NPPA, or other rare species (CDFW 2019; CDFW CNDDB 2020). Sensitive habitats may also include areas of high biological diversity, areas providing important wildlife habitat, and vegetation types that are rare or unique to the region. CEQA also considers impacts to natural communities identified as sensitive in local and regional plans, regulations, and ordinances.

WETLANDS AND WATERS OF THE STATE

CDFW Lake and Streambed Alteration Agreement

Jurisdictional authority of CDFW over relatively permanent bodies of standing or flowing water is established under Sections 1600-1616 of the CFGC, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream. The CFGC stipulates that "an entity may not substantially divert or obstruct the natural flow of, or substantially change…the bed, channel, or bank of, any river, stream, or lake" without notifying CDFW, incorporating necessary mitigation, and obtaining a Lake and Streambed Alteration Agreement. Any work which takes place below the break in bank would be under the jurisdictional authority of CDFW.

The code defines "entity" to mean "any person, state or local government, or public utility that is subject to this chapter" and is not generally taken to refer to federal agencies. If an entity does not initially accept the mitigation conditions proposed by CDFW for inclusion in a streambed alteration agreement, the matter may be submitted to an arbitration panel under section 1603.

CDFW has the opportunity to review projects and issue project conditions under CEQA and is also responsible for commenting on projects requiring USACE permits under the Fish and Wildlife Coordination Act of 1958. Federal lead agencies may also elect to notify CDFW according to Section 1602 and comply with the conditions and recommendations issued under this mechanism.

Porter Cologne Water Quality Control Act

The Porter-Cologne Water Quality Act (SWRCB 2018) assigns overall responsibility for water quality protection to the State Water Resource Control Board, and directs the nine statewide RWQCBs, who are tasked to develop and enforce water quality standards within their boundaries. Under California state law, "Waters of the State" pertains to "any surface water or groundwater, including saline waters, within the boundaries of the state." As a result, water quality laws and permitting authority apply to both surface and groundwater. In the absence of a federal permit requirement, impacts to waters of the state, including wetlands, require a Waste Discharge Requirement (WDR) authorization from the RWQCB (SWRCB 2018).

The Wetlands Resources Policy

The Wetlands Resources Policy of CDFW states that the California Fish and Game Commission will strongly discourage development in or conversion of wetlands, unless, at a minimum, project mitigation ensures that there will be no net loss of either wetland habitat values or acreage.

[11] A universally accepted definition of riparian habitat is not currently available; however, USFWS defines riparian areas as "plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (rivers, streams, lakes, or drainage ways). Riparian areas have one or both of the following characteristics: 1) distinctively different vegetative species than adjacent areas, and 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland" (USFWS 2009). See also Riparian Habitats under the Local Regulations section.

California Coastal Act

Under the Coastal Zone Management Act of 1972 and California Coastal Act of 1976, the California Coastal Commission is entrusted to review proposed development in the Coastal Zone with the goal of protecting and enhancing the coastal environment while allowing utilization and public access for coastal zone-dependent uses.

Under the Coastal Act, Environmental Sensitive Habitat Areas (ESHA)[12] and wetlands are given special protection, with a different set of rules for each.

Protections for ESHA are as follows:

> [ESHA] *shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas. Development in areas adjacent to* [ESHA]*…shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat … areas.* [California Public Resources Code (PRC) §30240 as amended 1991]

In Coastal Act wetlands – all areas meeting at least one wetland parameter – a handful of specifically authorized uses, including "nature study" and "similar resource-dependent activities," are permitted, but only where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects."

In *Bolsa Chica Land Trust v. Superior Court* (1999) 71 Cal.App.4th 493, 514-515, the California Court of Appeal held that, where an area in the Coastal Zone is both a wetland and an ESHA, the Coastal Act provision governing wetlands (§ 30233) controls, and the provision governing ESHA (§ 30233) does not also apply.

The Coastal Commission has approved several paved multi-use projects located in or adjacent to ESHA and wetlands, with identified goals of facilitating public access and protecting sensitive resources. In many of these approvals, the Commission determined that the public access, recreation, and educational benefits of the project were dependent on their location within the natural habitat. Interpretive signs and resource management plans were imperative to successfully protecting and enhancing sensitive habitats, while also improving public access in the Coastal Zone.

Based on the legal standards and Coastal Commission experience described above, the Proposed Project can achieve consistency with the Coastal Act as follows. Where a proposed trail segment would pass through an ESHA, it must be designed to prevent "any significant disruption of habitat values." Where a trail segment would be adjacent to ESHA, it must be "sited and designed to prevent impacts which would significantly degrade" the ESHA, and "be compatible with the continuance of" the ESHA. Where a trail segment would pass through a wetland, "feasible mitigation measures" must be "provided to minimize adverse environmental effects"; and the overall trail alternative chosen must be the least environmentally-damaging feasible alternative with respect to wetlands effects.

Both the County of Santa Cruz and the City of Watsonville have approved Local Coastal Programs (LCP) for implementing the Coastal Act's mandate to protect ESHA and wetlands within the Coastal Zone, as described below.

[12] Under the Coastal Act, ESHA is defined as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments."

3.3 *Local Regulations*

SANTA CRUZ COUNTY GENERAL PLAN AND LOCAL COASTAL PROGRAM

The Santa Cruz County General Plan and Local Coastal Program provides the following objectives and policies to protect biological resources (Santa Cruz County 1994).

- **Objective 5.1. Biological Resource Protection.** To maintain the biological diversity of the County through an integrated program of open space acquisition and protection, identification and protection of plant habitat and wildlife corridors and habitats, low-intensity and resource compatible land uses in sensitive habitats and mitigations on projects and resource extraction to reduce impacts on plant and animal life.
  - **Policy 5.1.2. Sensitive Habitat Definition.** An area is defined as a sensitive habitat if it meets one or more of the following criteria:

    (1) Areas of special biological significance as identified by the State Water Resources Control Board.

    (2) Areas which provide habitat for locally unique biotic species/communities including but not limited to: oak woodlands, coastal scrub, maritime chaparral, native rhododendrons and associated Elkgrass, indigenous Ponderosa Pine, indigenous Monterey Pine, mapped grassland in the Coastal Zone and sand parkland; and special forests including San Andreas Oak Woodlands, indigenous Ponderosa Pine, indigenous Monterey Pine and ancient forests.

    (3) Areas adjacent to essential habitats of rare, endangered or threatened species as defined in subsections (5) and (6) of this definition.

    (4) Areas which provide habitat for species of special concern as listed by the California Department of Fish and Game in the special animals list, natural diversity database.

    (5) Areas which provide habitat for rare or endangered species which meet the definition of Section 15380 of the California Environmental Quality Act guidelines.

    (6) Areas which provide habitat for rare, endangered or threatened species as designated by the State Fish and Game Commission, United States Fish and Wildlife Service or California Native Plant Society.

    (7) Nearshore reefs, rocky intertidal areas, seacaves, islets, offshore rocks, kelp beds, marine mammal hauling grounds, sandy beaches, shorebird roosting, resting and nesting areas, cliff nesting areas and marine, wildlife or educational/research reserves.

    (8) Dune plant habitats.

    (9) All lakes, wetlands, estuaries, lagoons, streams and rivers.

    (10) Riparian corridors.

  - **Policy 5.1.3. Environmentally Sensitive Habitat Area (ESHA) Protection.** Designate the areas described in 5.1.2 (d) through (J) as Environmentally Sensitive Habitats per the California Coastal Act and unless other uses are:

    (a) consistent with habitat protection policies and serve a specific purpose beneficial to the public;

    (b) it is determined through environmental review that any adverse impacts on the resource will be completely mitigated and that there is no feasible less-damaging alternative; and

    (c) legally necessary to allow a reasonable economic use of the land, and there is no feasible less-damaging alternative.

- **Policy 5.1.6. Development in Sensitive Habitats.** Sensitive Habitats shall be protected against a significant disruption of habitat values; and any proposed development within or adjacent to these areas must maintain or enhance functional capacity of the habitat. Reduce in scale, redesign, or if no other alternative exists, deny any project which cannot sufficiently mitigate significant adverse impacts on sensitive habitats unless approval of project is legally necessary to allow a reasonable use of the land.

SANTA CRUZ COUNTY SENSITIVE HABITAT PROTECTION ORDINANCE

The County of Santa Cruz Sensitive Habitat Protection ordinance (Section 16.32) is intended to “minimize the disturbance of biotic communities which are rare or especially valuable because of their special nature or role in an ecosystem, and which could be easily disturbed or degraded by human activity.” Sensitive habitats under the Santa Cruz County Code relevant to the Project include areas that provide habitat for locally unique biotic species/communities, such as oak woodlands and coastal scrub; areas adjacent to essential habitats of rare, endangered or threatened species, or other rare species considered under CEQA; dunes, wetlands, lagoons, rivers, and riparian corridors; and areas defined as ESHA under the Coastal Act.

The project is required to mitigate any unavoidable environmental impacts to sensitive habitats. The ordinance calls for protection of sensitive habitats “undisturbed by the proposed development activity” or on an adjacent parcel through measures such as conservation easements. Additionally, restoration “commensurate with the scale of the proposed development” is required for degradation of sensitive habitats caused by the project. Exemptions to this ordinance may be granted concurrently with authorized riparian exceptions.

Section 16.32 of the Sensitive Habitat Protection Ordinance addresses Harkins Slough Road improvements specifically for projects that:

> (1) expand the roadway prism outside of the existing paved area” [and] “(3) are necessary to serve permitted development located within City of Watsonville Coastal Zone Area C shall provide enhanced habitat connectivity…”

This portion of the ordinance specifies:

> Any such road improvements shall include measures to protect habitat, and shall be sited and designed to minimize the amount of noise, lights, glare and activity visible and/or audible within the sloughs. Night lighting shall be limited to the minimum necessary to meet safety requirements and shall incorporate design features that limit the height and intensity of the lighting to the greatest extent feasible; provide shielding and reflectors to minimize on-site and off-site light spill and glare to the greatest extent feasible; avoid any direct illumination of sensitive habitat areas; and incorporate timing devices to ensure that the roadway is illuminated only during those hours necessary for school functions and never for an all-night period.

Conditions for this portion of the ordinance include a “100-foot buffer measured from the high-water mark” and “Distance between structures and wetland shall be maximized”.

In addition, Chapter 17.02 of the Santa Cruz County Code addresses Urban Services and Rural Services Lines and Section 17.02.081 specifically addresses Harkins Slough Road as follows:

> Harkins Slough Road…shall be limited to the minimum width/capacity necessary to provide for roadway, bikeway and/or pedestrian access: (A) to serve permitted high school development on City of Watsonville Coastal Zone Area C, and/or (B) as needed to meet minimum County or Caltrans design standards. Any such road improvements shall be designed in tandem with the

development to be served by the road improvements in such a way as to minimize the linear extent of any such road improvements; Harkins Slough Road improvements not necessary to serve the permitted development to be served are prohibited.

In summary, improvements to Harkins Slough Road associated with the Lee Road Trail Project are permitted activities provided they are consistent with the conditions listed above.

SANTA CRUZ COUNTY RIPARIAN CORRIDOR AND WETLANDS PROTECTION ORDINANCE

The County of Santa Cruz Riparian Corridor and Wetlands Protection (16.30) limits development activities in riparian areas[13] and provides buffer/setback requirements[14] based on slope and vegetation composition. The Santa Cruz County Planning Commission may authorize a riparian setback exception on a case by case basis. Exceptions are granted pending an approved application stating the applicant's proposed activities, best management practices (BMP), and measures for mitigating impacts to the riparian corridor.

SANTA CRUZ COUNTY SIGNIFICANT TREE ORDINANCE

The County of Santa Cruz requires a permit for the removal of "significant trees" in the Coastal Zone (County Code Section 16.34). Within the urban and rural services line, significant trees are those greater than 20 inches in diameter at breast height (DBH) for single stemmed trees; any sprout clump of five or more stems each of which is greater than 12 inches DBH; or any group consisting of five or more trees on one parcel, each of which is greater than 12 inches DBH. Outside the urban services or rural services line where visible from a scenic road, any beach, or within a designated scenic resource area, significant trees include those equal to or greater than 40 inches DBH (approximately 10 feet in circumference); any sprout clump of five or more stems, each of which is greater than 20 inches DBH (approximately five feet in circumference); or any group consisting of 10 or more trees on one parcel, each greater than 20 inches DBH. No stipulations are made for native versus non-native and/or ornamental trees. Exceptions are made for trees that are diseased or deemed hazardous to public safety; or pursuant to a Timber Harvest Plan or Fire Protection Plan submitted to and approved by the California Department of Forestry. Removal of significant trees would require a permit issued by the County of Santa Cruz Planning Department and would likely require mitigation including, but not limited to, planting of replacement trees at a ratio and species composition determined by the Planning Department.

CITY OF WATSONVILLE GENERAL PLAN AND LOCAL COASTAL PROGRAM

The City of Watsonville General Plan and LCP (1994) and amendments generally protect biological resources through Natural Resource Protection, Wildlife Habitat Protection, and Water Quality Protection Sections of the General Plan and identification of Environmentally Sensitive Habitat Areas (ESHA) in Appendix B the LCP.

Biological resources in Watsonville are largely associated with water resources, and wetland habitat protection is important, particularly when the area provides refugia for special-status species. The South County (Watsonville) Slough Complex is also an area of ecological importance and designated as an Area of Significant Biological Importance by the CDFW and a Significant Biotic Resource in the Santa Cruz County

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[13] The Santa Cruz County Code defines riparian vegetation/woodland as "those plant species/woody plant species that typically occur in wet areas along streams or marshes" (Santa Cruz County Code 16.30.030). See also USFWS definition of riparian habitat under the Sensitive Habitats section (USFWS 2009).

[14] The ordinance states that a buffer "shall always extend 50 feet beyond the edge of riparian woodland for perennial streams and 20 feet beyond the edge of other woody vegetation as determined by the dripline" (Section 16.3.040).

Growth Management Plan. The Watsonville General Plan recognizes the slough system as a critical resource for wildlife, including resident and migrating waterfowl and raptors.

The General Plan outlines the following policies and implementation measures for resource protection within the Watsonville Planning Area:

- **Policy 9.B. Natural Resource Protection.** The City shall designate land necessary for preservation of natural resources and to avoid conflicts with urban land uses.
  - **9.B.1. Resource Zoning—** The City shall designate and zone environmentally sensitive areas as EM-OS (Environmental Management-Open Space) to prohibit urban development and to preserve natural resources.
  - **9.B.2. Natural Resource Mitigations—** The City shall require implementation of environmental mitigations on projects that may destroy or impair the future use or existence of natural resources.
  - **9.B.3. Environmental Constraints—** The City shall encourage development on land which has the fewest natural resource impacts and discourage development on land having multiple natural resource impacts. An environmental constraint matrix shale be developed for use by the City.
  - **9.B.4. Greenbelt—** The City shall utilize the greenbelt to serve any of the purposes described in Policy 3.D, Establishment of a Greenbelt
  - **9.B.5. Coastal Zone—** The City shall abide by the provisions of the *Watsonville Local Coastal Plan* and *Watsonville Local Coastal Plan Implementation Ordinance* in review of proposed development on Coastal Zone Lands.
  - **9.B.6. Environmental Review—** The City shall conduct an appropriate environmental Review process and require that proposed projects adjacent to surrounding, or containing, wetlands e subject to a site-specific analysis which will the determine the appropriate size and configuration of areas to buffer wetlands from urban development.

City of Watsonville Coastal Zone Implementation Plan Ordinance

The City of Watsonville Coastal Zone Implementation Plan and Local Coastal Land Use Plan require a coastal permit for development within the Coastal Zone. Coastal permit exemptions for various purposes include, but are not limited to: road repair, public utility maintenance, transmission facilities, weed abatement, public park maintenance, federal agency projects, minor improvements to existing residences, removal of dead or diseased trees, sidewalks and bikeways within the existing roadway not impacting sensitive habitat areas, and projects with a valid coastal permit.

Prior to issuance of a coastal permit, the hearing body will determine whether the proposed project a) is consistent with the General Plan, Local Coastal Land Use Plan, and Local Coastal Implementation Program; b) will protect vegetation, natural habitats, and natural resources consistent with the Local Coastal Land Use Plan; c) will meets other coastal zoning requirements for the parcel(s); d) meets minimum standards for setbacks, erosion; sediment; runoff; timing/and area; soils; and vegetation; and e) that special findings have been made including, but not limited to: agricultural viability study, availability of public utilities, that the proposed project could not be located in an existing developed area, that the development will utilize topographical or vegetative shielding from Highway 1 and, that a survey for Santa Cruz tarplant be conducted by a qualified botanist during the blooming period for the species.

4.0 RESULTS

4.1 *Floristic Inventory and Habitat Characterization*

An EcoSystems West botanist recorded a total of 93 species of vascular plants within the Study Area. A complete species list of plants encountered during the site visit is presented in **Appendix C**. Twenty-six of these identified species are native, and 67 species are non-native. Of the non-native species, 17 are considered invasive species with “moderate” or “high” ecological impacts by the California Invasive Plant Council (Cal-IPC, 2020). No special-status plant species were observed in 2019 and 2020 within the Study Area during focused rare plant surveys or other site visits. The majority of the Lee Road Trail Study Area consists of developed and landscaped areas, agricultural fields, and non-native grassland with encroaching coyote bush scrub. Non-native forest dominated by a eucalyptus hedgerow occurs in one area along Lee Road and extending east along an existing compacted dirt spur-trail/access road immediately north of the channelized portion Watsonville Slough. The trail is proposed to cross Struve Slough, a large open non-tidal body of fresh water with emergent wetland and riparian vegetation and along the margins.

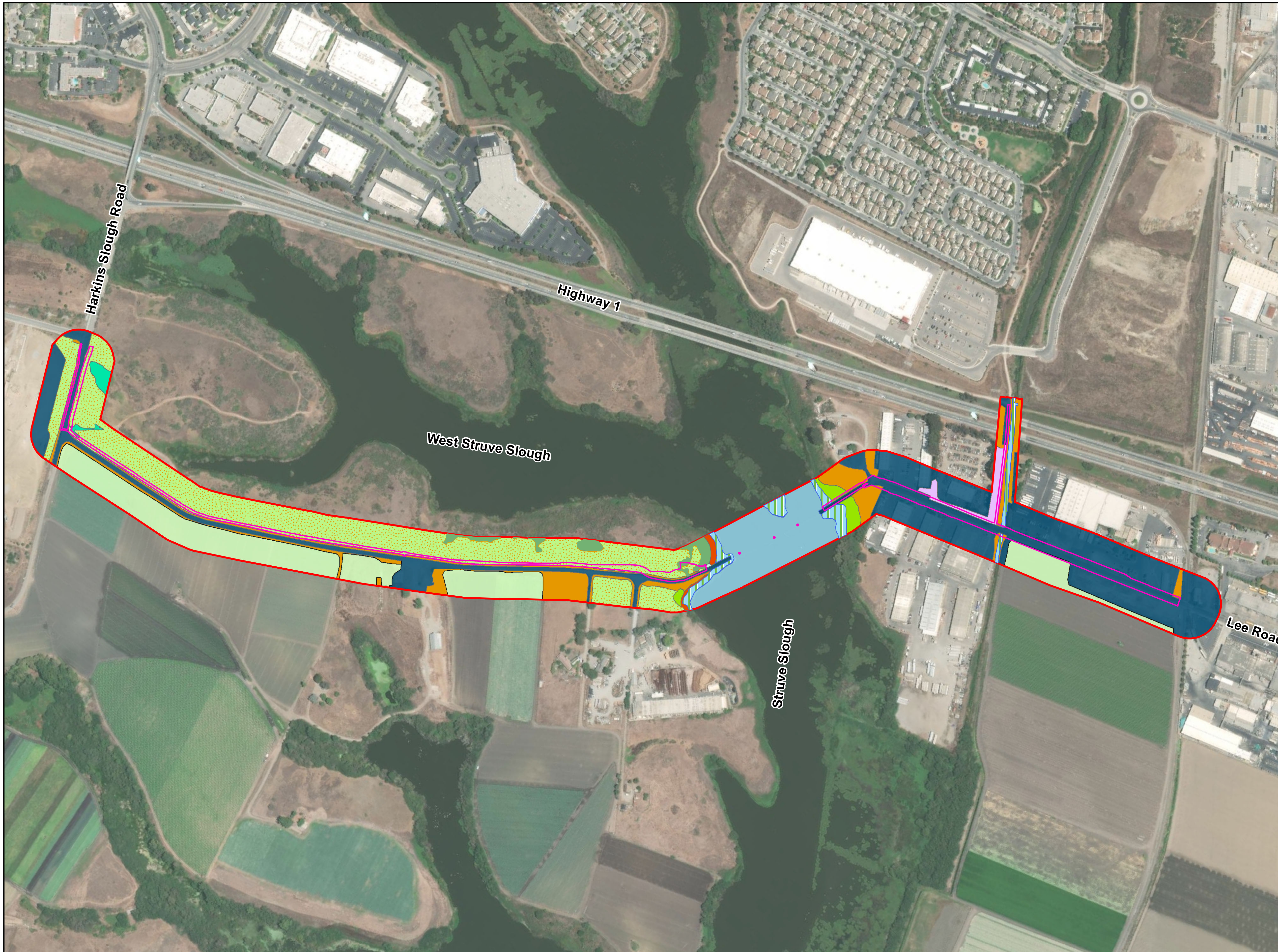
We recognize seven predominant habitat types occurring within the Study Area (**Figure 4**):

- Non-native grassland (with scattered coyote brush)
- Coastal scrub (*Baccharis pilularis* Alliance and *Rubus Alliance*)
- Palustrine emergent wetlands
- Arroyo willow riparian
- Aquatic
- Agricultural fields
- Non-native forest (eucalyptus hedgerow)
- Ruderal/ruderal scrub
- Developed/Landscaped

Within the proposed Lee Road Trail Study Area, non-native grassland, agricultural fields, non-native forest, ruderal, and developed/landscaped habitats are considered non-native, as they are typically associated with heavy, ongoing or repeated human disturbance; and the majority of this vegetation is naturalized or has been introduced, oftentimes intentionally. The coastal scrub, seasonal wetland, riparian, freshwater marsh, and aquatic habitats are generally considered native as they do not exist solely as a result of human influence. However, some degree of past disturbance may have affected these habitat types, so non-natives species usually occur and may even be dominant within these areas.

NON-NATIVE GRASSLAND WITH SCATTERED COYOTE BRUSH

Within the Study Area, the non-native grassland habitat type corresponds to the *Avena* spp.-*Bromus* spp. (42.027.00) and *Phalaris aquatica* (42.051.00) Herbaceous Alliances of Sawyer et al. (2009) and CDFW (2020c) and to a phase of the non-native grassland type described by Holland (1986). Within the Study Area, non-native grasslands are also undergoing colonization of coyote brush (*Baccharis pilularis*), a native woody shrub. These areas represent an early successional stage following cessation of ongoing management (e.g., grazing, mowing) and, other than coyote brush and Pacific aster (*Symphyotrichum chilense*), are comprised almost entirely of invasive and/or non-native grasses and forbs.



ECOSYSTEMS WEST CONSULTING GROUP

Figure 4.

Habitat Types and Natural Plant Communites

Lee Road Trails Project Area

- Study Area Boundary
- Proposed Lee Road Trail Permanent Impacts
- Freshwater Marsh
- Seasonal Wetland
- Seep
- Aquatic
- Coastal Scrub
  - Baccharis pilularis Alliance
  - Rubus Alliance
- Arroyo Willow Riparian
- Non-Native Forest
- Non-Native Grassland
- Agriculture
- Ruderal
- Developed-Landscaped

N

1 inch=500 feet

0 250 500 1,000 Feet

Drawn By: J. Davilla, ESW
Date: 5/9/2020
Filepath: E:\Lee Road Trails\Biological Assessment\Habitat Type Map

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Non-native grassland occurs along the margins of the CDFW Reserve in the Lee Road North section of the proposed trail. Non-native grasslands are comprised primarily of weedy, grass and forb species of Eurasian origin. It is important to note that in more mesic coastal sites, non-native grassland often contains a higher percentage of perennial grasses species than more interior locations. In particular Harding grass (*Phalaris aquatica*) is locally abundant, in some instances forming dense, monospecific stands.

Non-native grassland is dominated by wild oats (*Avena barbata*), Harding grass, soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), six weeks fescue (*Festuca bromoides*), Italian ryegrass (*Festuca perennis*), purple vetch (*Vicia benghalensis*), English plantain (*Plantago lanceolata*), sheep sorrel (*Rumex acetosella*), curly dock (*Rumex crispus*), cutleaf geranium (*Geranium dissectum*), poison hemlock (*Conium maculatum*), and aggregations of coyote brush. A large percentage of plant species identified within this habitat type are listed as invasive weeds with "moderate to high ecological impacts" by the California Invasive Plant Council (Cal-IPC) (2020).

Within the non-native grassland on the CDFW Reserve, a small relictual patch of California oatgrass (*Danthonia californica*) occurs on the top of the southernmost grassland knoll immediately north of Struve Slough. In this area, soils are loamy and slightly mesic, and non-native grasses are shorter in stature allowing for the persistence of native bunchgrasses. This area lacks other typical indicator species of coastal prairie, including native forbs and purple needlegrass, and does not indicate intact prairie habitat. However, a native seedbank may be present in this area and could be expressed using proper management strategies including grazing, mowing, and prescribed fire.

Many bird species utilize contiguous non-native grassland to forage and hunt for invertebrates, seeds, and/or small mammals. Some species utilize grassland habitats for nesting, such as grasshopper sparrow (*Ammodramus savannarum),* mourning *dove (Zenaida macroura)*, western meadowlark *(Sturnella neglecta)*, song sparrow (*Melospiza melodia*), and northern harrier (*Circus hudsonius)* (previously *cyaneus*). Numerous small mammal burrows were present within the grassland habitat. Botta's pocket gopher (*Thomomys bottae*), ground squirrel, and California meadow vole (*Microtis californicus*) commonly occur in non-native grassland, along with lizards such as coast range fence lizard (*Sceloporus occidentalis bocourtii*). These species in turn provide prey for garter snake (*Thamnophis* sp.), gopher snake (*Pituophis catenifer catenifer*), and raptors, along with bobcat (*Lynx rufus*) and coyote (*Canis latrans*). Mammal burrows are also utilized by common and sensitive amphibian and reptile species for refuge. We observed the scat of black-tailed deer (*Odocoileus hemionus*) within the non-native grassland. The scattered coyote brush provides structural diversity as well as additional food sources, refuge, and nesting habitat. Brush rabbit (*Sylvilagus bachmani*) and ground squirrel (*Otospermophilus beecheyi*) are likely to utilize the coyote brush for cover. The edge habitats[15] or ecotones, between the non-native grassland and adjacent coastal scrub and slough habitats, are particularly productive and provide a range of foraging, refuge, and nesting opportunities for wildlife species.

We documented a number of bird species utilizing the non-native grassland habitat of the Study Area for foraging and breeding activities (**Appendix D**).

[15] Edge habitats occur when two or more habitat types abut one another. Edge habitats provide an abundance and variety of food sources because they have diverse plant species and microhabitat variability, including cover, shelter, and shade, as well as sun exposure for warmth and air flow for circulation.

COASTAL SCRUB

The coastal scrub habitat type in the Study Area is typified by low to moderate sized woody shrubs with mesophilic leaves and small diameter flexible branches. These shrubs are often relatively short-lived with a shallow root structure and typically occur in shallow, often rocky soils. Due to marine influence, soils tend to be higher in concentration in salts than more inland areas. Coastal scrub tends to persist as a climax seral state in areas with cool, mesic microclimates and persistent fog. Growth habits of dominant shrubs range from prostrate to arboreal. Along the Project corridor, this habitat type corresponds to a phase of northern coastal scrub habitat type (Holland 1986) and various vegetation alliances depending on dominant species composition (Sawyer et al. 2009, CDFW 2019), including the *Baccharis pilularis* (32.060.00; G5/S5) *and Rubus* (63.901.00; G4/S3) Alliances*,* with *Toxicodendron diversilobum* sub-dominant in both Alliances. These Vegetation Alliances are described in detail below, within the broader coastal scrub habitat type, including specific dominant species associations in each alliance.

Structure and composition of coastal scrub is variable along the Project corridor. Differing relative cover of native and non-native species often corresponds to disturbance regimes, proximity to urbanized development (e.g., roads, trails, structures), microclimate, topographic position, and edaphic (soil) properties (Barbour et al. 2007). In general, areas dominated by coastal scrub are dense with mostly closed canopy, but openings consist of a diverse mix of native and non-native grasses and forbs. Hydrophytic plants occur in mesic areas of coastal scrub where moisture is persistent at or near the ground surface for extended periods of times.

The coastal scrub alliances described below provide habitat for a range of wildlife species, offering varied food sources, cover from predators, and shelter. The coastal scrub habitats near the proposed trail alignment are in proximity to West Struve Slough and Struve Slough, as well as to open areas such non-native grassland and agricultural fields. Habitat mosaics and reliable water sources increase the habitat value of these coastal scrub habitats for wildlife.

Numerous bird species were observed using the coastal scrub for perching, foraging and nesting, such as song sparrow, goldfinch species, California towhee, Anna's hummingbird, and other species listed in **Appendix D**.

Coastal scrub is a preferred habitat for small mammals, such as brush rabbit (*Sylvilagus bachmani*) and ground squirrel (*Otospermophilus beecheyi*). This habitat type may also support San Francisco dusky-footed woodrat. Skunks (*Mephitis mephitis*) may use the coastal scrub for cover. Coast range fence lizard (*Sceloporus occidentalis bocourtii*) was also observed in this habitat.

Baccharis pilularis Alliance

In the Study Area, the *Baccharis pilularis* Alliance (G5/S5) primarily describes areas that are dominated by a dense assemblages of coyote brush with Pacific aster and poison oak (*Toxicodendron diversilobum*) co-dominant (32.060.17; G5/S5?). This habitat type often intergrades with the *Rubus* Alliance (described below) where Pacific blackberry growth form is typically a spreading woody vine.

Rubus Alliance

The *Rubus* Alliance (G4/S3) is dominated by dense thickets of Pacific blackberry and shares many similarities the *Baccharis pilularis* Alliance described above. Common associates include weedy grasses and forbs including Italian ryegrass (*Festuca perennis*), cutleaf geranium (*Geranium dissectum*), bur clover (*Medicago polymorpha*), prickly ox tongue (*Helminthotheca echioides*), and poison hemlock (*Conium* *maculatum*). Within the Study Area this habitat type is limited to a band of vegetation along the southern knoll north of Struve Slough, above the fringe of emergent freshwater marsh and below the coyote brush scrub and non-native grassland further upslope. This habitat type is typically considered a Coastal Act wetland in the Arid West region due to dominance by Pacific blackberry, a perennial facultative (FAC) shrub in the Arid West Region.

PALUSTRINE EMERGENT WETLANDS

Wetlands are those areas that are transitional between aquatic and terrestrial systems, where surface water is at a depth and duration sufficient to promote the development of hydric soils and a preponderance of hydrophytic wetland vegetation. Within the Study Area, palustrine emergent wetland types include seasonal wetland, seep wetland, and emergent freshwater marsh associated with Struve Slough.

Seasonal wetlands are characterized by shallow depressional topography with inundation and/or saturation only occurring during the rainy season. These features are typically dominated by annual and perennial grasses and forbs, many of which may occur in both wetlands and upland habitats (i.e., facultative wetland species). One seasonal wetland totaling 0.07 acres was identified within the CDFW Reserve near the north entrance by Harkins Slough Road. This feature was dominated by weedy annual facultative (FAC) grasses and forbs including Italian ryegrass, Mediterranean barley, and English plantain. Direct hydrologic indicators demonstrate that the marginal feature does not appear to flood and is likely saturated for a short duration during the rainy season.

The 0.01-acre seep wetland is situated along the steep, eastern embankment of Lee Road immediately north of the area where the road becomes submerged beneath Struve Slough. This feature is formed where subsurface lateral flows intercept the abrupt escarpment/roadcut and is dominated almost entirely by Santa Barbara sedge (*Carex barbarae;* FAC). While meeting the formal criteria for wetland hydrology based on evidence of oxidized rhizospheres on living roots, this feature also lacked evidence of inundation (flooding) or prolonged saturation outside of the rainy season.

Emergent freshwater marsh habitat occurs on the fringe of Struve Slough and within scattered shallow portions throughout the central portion of the slough. These areas are dominated entirely by perennial, emergent wetland vegetation including cattails (*Typha latifolia,* OBL), bulrush (*Schoenoplectus californica,* OBL), flat sedge (*Cyperus eragrostis,* FACW), broadfruit bur reed (*Sparganium eurycarpum,* OBL*),* and water smartweed (*Polygonum amphibium,* OBL). Additional freshwater emergent marsh is located within the channelized portion of Watsonville Slough in the southern portion of the Study Area. This feature is dominated primarily by broadleaved cattail.

During the rainy season, the seasonal wetland and seep may provide hydration points or refuge for amphibian species such as chorus frog (*Pseudacris sierra*) and California red-legged frog (CRLF) (*Rana Draytonii*). Freshwater marsh habitat within the Study Area provides habitat for amphibians and numerous bird species (**Appendix D**).

ARROYO WILLOW RIPARIAN FOREST

Along the southern border of Struve Slough adjacent to Lee Road, riparian vegetation corresponds to the central coast arroyo willow riparian forest habitat type (Holland 1986), although Holland does not recognize this type north of Monterey County, and the *Salix lasiolepis* Alliance and Association (Sawyer et al 2009, CDFW 2019). Tree-sized arroyo willow (*Salix lasiolepis*) dominates this riparian forest habitat type.

Coast Live Oak (*Quercus agrifolia*) and non-native Monterey pine (*Pinus radiata*) are also found in the more upland portions of the riparian forest. The arborescent to arboreal canopy is typically dense and often impenetrable, although openings of various sizes occur locally. The native woody vine Pacific blackberry is abundant and often very dense in the understory. Few other understory species occur except in relatively open areas. Dense thickets of poison oak (*Toxicodendron diversilobum*) are localized in openings.

Along Struve Slough, the riparian vegetation supports a suite of wildlife species, including insects, amphibians, birds and mammals. Sierran chorus frog (*Pseudacris sierra*) and California red-legged frog (*Rana draytonii*) are known to occur in these habitats, as well as non-native American bullfrog (*Lithobates catesbeiana*). Migratory and resident bird species utilize the riparian habitat adjacent to the sloughs (**Appendix D**). Riparian habitats provide a dense multi-tiered canopy with diverse foraging, roosting, sheltering, and/or nesting habitat for birds and are important stopover sites for migratory bird species. The riparian vegetation provides cover from predators and insulating properties that shelter wildlife species from the sun and prevailing weather patterns. Foliage-roosting bat species may roost in these habitats and hunt over the adjacent sloughs.

The riparian vegetation also buffers the adjacent aquatic habitat contributing shade, food, and sources of nutrients to the sloughs and aquatic wildlife species. Structurally, downed trees and willow mats create microhabitats that are important for birds, amphibians, and aquatic insects.

AQUATIC

Aquatic habitat is composed of unvegetated, natural and man-made open bodies of water. Aquatic open water habitat is limited entirely to Struve Slough, a shallow, freshwater non-tidal slough associated with the larger Watsonville Sloughs complex. There are no other open water habitats including ponds or streams within the Study Area.

Struve Slough supports invertebrates, native amphibians, and numerous shorebirds (**Appendix D**), as well non-native Louisiana crayfish (*Procambarus clarkii*), non-native American bullfrog, and introduced fish species: common carp (*Cyprinus carpio*), bullheads (*Ameiurus sp*), mosquitofish (*Gambusia affinis*), sunfishes (*Lepomis sp*), largemouth bass (*Micropterus salmoides*). Together with the marsh and riparian habitats that border the slough, this feature offers important habitat values to wildlife species, providing water and food sources for birds and mammals, as well as shade and cover. Aquatic habitats in the area moderate the Mediterranean climate of the region, allowing wildlife to adjust to seasonal and climatic fluctuations.

AGRICULTURAL FIELD

Much of the land east of Lee road in the northern portion of the Study Area is currently in agricultural production of organic strawberries and vegetables. A portion of the agricultural fields are fallow each year and active cultivation is rotational. This agricultural land is referred to as Watsonville Slough Farm and is currently owned and leased by the Land Trust of Santa Cruz County.

The majority of these agricultural fields are considered “prime agricultural land” by the County of Santa Cruz and have been cultivated for decades. Present management includes dry season irrigation, herbicide application, and tilling with heavy machinery. As a result, these areas have marginal habitat value and do not support naturalized vegetation or sensitive plant communities.

Agricultural fields are likely to support invertebrate and seed-eating bird species, as well as ground-nesting bird species, such as those listed in **Appendix D** and under the non-native grassland section above. Small mammals [such as Botta's pocket gopher, mice (*Peromyscus* sp.), and moles (*Scapanus sp.*) commonly occur in agricultural fields and buffers along with common lizard species. Agricultural fields are also likely to support higher trophic-level wildlife species that prey on small mammals and reptiles, as described in the non-native grassland habitat section above. Agricultural practices can result in injury or mortality of wildlife species, and agricultural fields lack abundant resources for wildlife. Therefore, in the overall landscape of the study area and surroundings, agricultural fields increase fragmentation and deter wildlife movement.

NON-NATIVE/EUCALYPTUS FOREST

Non-native forest within the Study Area is limited to a planted blue gum eucalyptus (*Eucalyptus globulus*) and red gum (*Eucalyptus camaldulensis*) hedgerow with individual non-native pine trees located along the channelized section of Watsonville Slough between Lee Road and Highway 1. This naturalized forest type corresponds to *Eucalyptus* Semi-Natural Woodland Stands of Sawyer et al (2009) and CDFW (2019b). Eucalyptus trees are able to rapidly grow from seed or can resprout following disturbance (cutting, fire, etc.) to an existing tree. Understory vegetation is often sparse due to litter accumulation and possible allelopathic effects of oils found in eucalyptus leaf and root exudates. Blue gum eucalyptus trees are an exotic species and rated as a "moderately invasive" by the California Invasive Plant Council (Cal-IPC 2020).

The non-native forest within the Study Area provides foraging, roosting, and nesting habitat for birds (**Appendix D**) and roosting habitat for common bat species.

RUDERAL

Ruderal areas are not described by Sawyer et al. (2009) or Holland (1986). Within the Study Area, ruderal communities consist of highly disturbed, weedy areas immediately adjacent to Lee Road and other developed areas on the site. Vegetation is dominated by aggressive, opportunistic species including poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), cheeseweed (*Malva parviflora*), pineapple weed (*Matricaria discoidea*), Bermuda grass (*Cynodon dactylon*), and redstem filaree (*Erodium cicutarium*). Ruderal scrub is comprised of dense thickets of non-native Himalayan blackberry with wild radish (*Raphanus sativus*) and poison hemlock. Ruderal scrub is located south and upslope of the Arroyo willow riparian forest south of Struve Slough and north of the developed/industrialized portion of Lee Road. Due to the proximity to roads and other ongoing disturbances, ruderal areas tend to persist over time and succession to other natural communities is limited.

Ruderal (and developed) habitats support opportunistic bird species such as American crow *(Corvus brachyrhynchos*), barn swallow (*Hirundo rustica*), and house finch (*Haemorhous mexicanus*), as well as common mammal species such as skunk, raccoon, and squirrels.

DEVELOPED/LANDSCAPED

North of Struve Slough, developed and landscaped areas include Lee Road and other dirt and paved roadways, farm buildings, and other infrastructure on the west side of Lee Road. South of Struve Slough, developed areas include sidewalks, driveways, parking lots and buildings associated with the light industrial area. Landscaping with ornamental plants is limited but occurring in parking lots and around businesses along Lee Road.

4.2 *Sensitive Habitats*

COASTAL SCRUB

Coastal scrub is considered ESHA by the County of Santa Cruz Local Coastal Program (LCP) (Santa Cruz County 1994) and County of Santa Cruz sensitive habitat (Santa Cruz County Code 16.32). The *Rubus* Alliance (Coast brambles; G4/S3) is also considered a sensitive habitat by CDFW. Within the Study Area, coastal scrub is located primarily on ridgetops and east facing slopes above West Struve Slough within the CDFW Reserve.

Minimal permanent and temporary impacts are expected to result from trail construction or usage. The majority of the trail is planned to be more than 100 feet west of contiguous coastal scrub habitat.

ARROYO WILLOW RIPARIAN FOREST

Arroyo willow riparian forest is considered an ESHA and sensitive habitat type by the County of Santa Cruz LCP, Sensitive Habitat Ordinance, and Riparian Corridor and Wetlands Protection Ordinance (Santa Cruz County Code 16.32). The *Salix lasiolepis* Association (62.201.01) is also described as a sensitive natural community by CDFW. These areas are regulated as wetland habitats by the California Coastal Commission due to dominance by arroyo willow, a facultative wetland (FACW) species. Riparian communities are considered sensitive habitat due to their value to wildlife, limited distribution, and decreasing acreages statewide. Riparian vegetation is valued for wildlife habitat, flood protection, stream bank stabilization, erosion control, and water quality related to nutrient and sediment filtration by riparian vegetation.

Within the Study Area, arroyo willow riparian habitat primarily occurs along the majority of the southern embankment of Struve Slough, and it provides habitat and movement corridors for a variety of common and special-status wildlife species. This habitat's rich ecological values for wildlife are described in the Habitat Characterization Section above.

Minimal permanent and temporary impacts to arroyo willow riparian forest are anticipated to result from the construction of the proposed Project.

AREAS THAT SUPPORT SENSITIVE SPECIES OR HIGH BIOLOGICAL DIVERSITY

In addition to the habitat types listed above, areas that support sensitive species would also be considered sensitive habitats Under the County of Santa Cruz LCP and Sensitive Habitat Ordinance. Within the Study Area, CRLF refuge, upland, movement and dispersal habitats for would be considered sensitive habitats. This would include the riparian freshwater marsh and riparian areas adjacent to aquatic habitat as well as non-native grassland and coastal scrub in upland areas. No radiotracking studies have been conducted for this location; however, CRLF are known to move directly between aquatic (non-breeding and breeding) habitats, and juvenile frogs may disperse from their natal habitat in all directions. California red-legged frogs may move through upland habitats near Chivos Pond, West Branch Struve Slough, Struve Slough, and channelized Watsonville Slough, such as the coastal scrub and non-native grasslands within the CDFW Reserve and fallow agricultural fields located west of Lee Road.

Edge habitats within the CDFW Reserve would be considered areas of high biological diversity and are therefore sensitive habitats. In addition to edges between the CDFW and County sensitive habitats listed above, ecotones between coastal scrub and non-native grassland would also be considered sensitive habitats. This edge habitat is likely to support the San Francisco dusky-footed woodrat, with the coastal scrub providing a structural framework for woodrat houses, as well as cover, and a moderating influence on weather, the grassland typically provides more sun exposure; together, both habitats provide more diverse food sources. Similarly many bird species utilize edge habitats for cover, shelter, foraging and nesting. Lawrence's goldfinch, a Bird of Conservation Concern, and other bird species were observed foraging in the coastal scrub (*Baccharis pilularis* Alliance) grassland ecotone within the CDFW Reserve. The coastal scrub (*Rubus* Alliance) edge habitats east of Struve Slough are also likely to support numerous bird species.

POTENTIAL WETLANDS AND "OTHER WATERS" OF THE U.S.

One 0.07-acre seasonal wetland was identified within the northernmost portion of the Study Area near the gated entrance to the CDFW Reserve by Harkins Slough Road. An additional 0.26 acre recently restored seasonal wetland is located northeast of the CDFW gate along Harkins Slough Road directly across from the driveway to the Pajaro Valley High School. These areas were determined to have evidence of hydrophytic vegetation, wetland hydrology, and hydric soils as required by USACE delineation guidelines. Additionally, a 0.01-acre seep wetland and 1.2 acres of emergent freshwater marsh were identified within the Study Area. The methods used to delineate jurisdictional wetlands and "waters" were based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). These features are likely considered potentially jurisdictional wetlands by the ACOE and CCC.

WATERS OF THE STATE OF CALIFORNIA

No additional areas exclusively classified as Waters of the State, including isolated wetlands, were identified within the Study Area. All existing wetlands and waterways are considered to be jurisdictional under Section 404 of the Clean Water Act.

COASTAL ACT WETLANDS

No one or two parameter Coastal Act seasonal wetlands were determined to occur within the Study Area. Several areas were dominated by Italian ryegrass, poison hemlock, and curly dock, all facultative weedy grasses and forbs. However, co-dominant plants are classified as upland species in these areas, and no direct or indirect evidence of wetland development including contemporary wetland hydrology and hydric soils were observed. During spring 2019 reconnaissance level surveys, several areas in the northern portion of the western terrace were identified as potential Coastal Act wetlands due to a preponderance of facultative (FAC) hydrophytic vegetation. However, rainfall totals recorded at the nearby Watsonville Municipal Airport during the 2018-19 rainy season measured approximately 115 percent of normal (NRCS 2018a). During subsequent focused rare plant surveys in May 2020 following normal seasonal rainfall totals, these areas were dominated primarily by upland plants including wild oats and brome grasses, and evidence of persistent wetland hydrology was lacking. These areas do not appear to be Coastal Act wetlands under normal conditions.

4.3 *Significant Trees*

A portion of the Study Area and Project Area is located within the Coastal Zone and the jurisdiction of the County of Santa Cruz and any significant trees within this portion of the trail alignment would be subject to the County Significant Tree Ordinance. One large (72-inch DBH) eucalyptus tree is proposed for removal to allow installation of the proposed southern Struve Slough Bridge approach. This tree is located within the jurisdiction of the County of Santa Cruz south of Struve Slough and east of Lee Road and would therefore be subject to the County Significant Tree Protection Ordinance.

4.4 *Special-Status Wildlife*

The proposed Lee Road Trail Project Area and Study Area supports or has potential to support 11 sensitive wildlife species. During our 2019 and 2020 surveys, we observed the following special-status wildlife species:

- white-tailed kite (*Elanus leucurus*), and
- Lawrence's goldfinch (*Spinus lawrencei)*.

The following sensitive wildlife species are known to occur in or near the Study Area:

- California red-legged frog (CRLF) (*Rana draytonii*),
- western pond turtle (*Emys marmorata = Actinemys pallida)*,
- bald eagle (*Haliaeetus leucocephalus),*
- northern harrier (*Circus hudsonius*),
- grasshopper sparrow (*Ammodramus savannarum*), and
- oak titmouse (*Baeolophus inornatus*).

The following species has the potential to occur based on the presence of available suitable habitat and known occurrences in the vicinity:

- San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*).

The following avian species are known from the vicinity of the Study Area outside of their breeding seasons (and have not been known to breed in the area since 1987 and 2008, respectively):

- western burrowing owl (migrants or wintering only) (*Athene cunicularia*)
- tricolored blackbird (nesting colony) (*Agelaius tricolor*).

Common avian species are likely to use the Study Area for nesting. Common bat species may utilize the trees within or near the Study Area for roosting, and forage over the sloughs.

AMPHIBIANS AND REPTILES

No sensitive reptile or amphibian species were observed during out site visits. Based on a USFWS protocol site assessment, long-toed salamander and California tiger salamander are not expected to occur with the Study Area (**Appendix E**). The California red-legged frog (CRLF) is known to occur within the Study Area. The results of the CRLF site assessment are summarized below.

California Red-legged Frog

The CRLF is listed as Threatened under the federal Endangered Species Act (USFWS 1996) and is a California Species of Special Concern (CDFW 2020c). The CRLF may use a variety of habitat types, including aquatic, riparian, and upland habitats. Breeding habitat includes ponds, slow-flowing stream reaches (including lagoons and marshes) and off-channel pools, deep pools in streams with vegetation such as bulrush (*Schoenoplectus californica)* and cattail (*Typha* sp.), or other substrates for egg mass attachment of sufficient duration (mid- to late summer) that tadpoles can complete metamorphosis. The CRLF also occurs in human environments such as stock ponds, sewage treatment ponds, wells, canals, golf course ponds, irrigation ponds, sand and gravel pits (containing water), and large reservoirs (Jennings 1988). Introduced predators (centrarchid fish, crayfish, and bullfrogs (*Rana catesbeiana*) limit or preclude the occurrence of CRLF over time.

Riparian, upland, and dispersal habitats are contiguous with breeding and non-breeding aquatic habitats, free of barriers, and serve to connect aquatic habitats within 1 mile (1.6 km) of one another (USFWS 2010).

Individuals may live in a single habitat type for their entire life, given sufficient and varied food, shelter and cover, to meet differing habitat requirements for all life stages; however, CRLF often move between breeding and non-breeding habitats. Varied landscapes consisting of aquatic, riparian, and upland habitats in close proximity to one another allow individuals to disperse based on environmental conditions (USFWS 2002).

The CRLF breeds from November to April with mating most commonly occurring in February or March locally, after the onset of rain. Eggs masses are deposited near the surface of the water attached to emergent vegetation, such as bulrushes (*Schoenoplectus* spp.), cattails (*Typha* spp.), roots or twigs, usually from 3-8 inches deep (Storer 1925). In lentic environments, egg masses have been observed unattached or loosely attached to floating mats of vegetation (Reis 1999). Eggs hatch and mature into tadpoles after 20 to 22 days, then develop into frogs after 11 to 20 weeks, usually between July and September and sometimes overwintering to metamorphose the following March or April (USFWS 2002).

CRLF subadults and adults are known to disperse overland up to 2 miles (3.2 km) between breeding and aquatic sites to forage and/or breed (Bulger et al. 2003; USFWS 2002). Transient frogs have been observed in a variety of upland areas considered unsuitable for frogs such as open grasslands, croplands, and roads (USFWS 2002 and 2006). They have also been observed in environments providing more refuge opportunities: dense thickets of shrub-like vegetation, leaf litter, slash/debris piles, stockpiled boulders/rip-rap (Rathbun et al. 1993, Jennings and Hayes 1994; USFWS 2006).

The CRLF is active year-round along the California coast, but will aestivate from late summer to early winter in small mammal and rodent burrows, as well as in cracks and crevices in the ground, especially if their associated aquatic habitat becomes dry (Jennings and Hayes 1994).

Within and immediately adjacent to the Study Area, CRLF is known to occur in Struve Slough (2006), West Branch Struve Slough (2006) [55 meters (180 feet) from the proposed Project Area], Chivos Pond (2020) [110 meters (360 feet) from the proposed Project Area], and in the channelized portion of Watsonville Slough. Observations in the sloughs have been scarce over the last two years. Breeding in 2020 was documented in channelized Watsonville Slough and, further west from the proposed area, in lower Harkins Slough (Kittleson 2020). It is possible that CRLF may move or disperse through the upland portions of the Project Area between known aquatic habitats. Struve Slough also supports as non-native predators: Louisiana crayfish (*Procambarus clarkii*), American bullfrog, common carp (*Cyprinus carpio*), bullheads (*Ameiurus sp*), mosquitofish (*Gambusia affinis*), sunfishes (*Lepomis sp*), and largemouth bass (*Micropterus salmoides*) as well as native avian CRLF predators.

Within the Study Area, small mammal burrows in non-native grassland habitat, coastal scrub vegetation, and riparian and marsh vegetation provide refuge opportunities for CRLF. These habitats are contiguous with aquatic habitats occupied by CRLF.

Western Pond Turtle

The western pond turtle (*Emys marmorata*) is a CDFW Species of Special Concern (CDFW 2020c, Thompson et al. 2016). The western pond turtle (WPT) is found in ponds, marshes, rivers, streams, and irrigation ditches containing aquatic vegetation. This species is usually observed sunning on logs, banks, or rocks. The WPT moves up to 3-4 miles, especially during "walk-abouts" before a female lays eggs (mid-May through early September), within creek (or slough) systems and sometimes overland, even into urban and suburban areas. The female typically nests up to several hundred feet from aquatic habitat, in open woodlands, open forest, or grasslands, typically with low-growing vegetation or bare soil on south- or west-facing slopes where there is adequate sun exposure (Holland and Bury 1998). The WPT is known to occur in Struve Slough although the most recent CNDDB record is for one individual from 2007 (CNDDB 2020a,b). In 2019 an individual gravid female was found on Main Street near Struve Slough and was relocated back into Struve Slough near Lee Road, with suitable nesting habitat nearby (Reis 2020). This species is also known from observations in Pinto Lake and the Pajaro River (Mori 2018; CNDDB 2020a,b). The CDFW Reserve provides potential nesting habitat, especially northeast and east of West Branch Struve Slough where the sun exposure and topography are suitable for nesting. Based on the very limited observations recorded in the CNDDB (2020a, b) and from communications with local experts, the number of individuals in West Branch Struve Slough and Struve Slough is expected to be low.

AVIAN SPECIES

During our 2019 and 2020 surveys, we observed two special-status bird species within the Study Area: white-tailed kite and Lawrence's goldfinch. Five additional special-status bird species were listed as 'Present' or 'Possible": bald eagle, northern harrier, western burrowing owl (wintering), oak titmouse, and grasshopper sparrow (**Appendix B**). Although we did not observe these species during the 2019 surveys, they are known to occur in the vicinity, and the Study Area provides potential nesting habitat (or potential foraging/wintering habitat) (CNDDB 2020a,b; ebird 2020). These special-status species may utilize the Study Area and are described in more detail below.

All nesting birds of prey (i.e., hawks and owls), other native nesting birds and their occupied nests, and individual birds of prey and passerine birds are protected by the federal MBTA and by California Fish and Game Commission Code (CFGC) (§ 3503 and 3503.5). Special-status bird species receive additional protections, primarily for nesting activities, with some species (such as Fully Protected species) receiving additional protection for wintering and foraging activities. Suitable potential nesting habitat for special-status birds, raptors, and other common avian species is present within the Study Area.

Northern Harrier

The nesting activities of the northern harrier are protected as a CDFW Species of Special Concern (CDFW 2020c, Shuford and Gardali 2008). The northern harrier hunts over open wetlands, marshes, grasslands, pastures, and active and fallow agriculture fields. Its diet consists of rodents and other small to medium-sized mammals, birds, insects, reptiles, amphibians and carrion (Smith et al. 2011).

Breeding occurs from April to September. The harrier nests in treeless habitats, building a loose nest composed of grasses, forbs, weeds, and wetland plants, on the ground or in thick vegetation near the ground in a well-concealed location, often near creeks or stock ponds. Females brood, raise and defend the young without the males. However, male and female northern harriers will roost communally (on the ground) during the non-breeding season (Smith et al. 2011).

We did not observe the northern harrier during our 2019 site visits; however, numerous ebird records document the northern harrier on the CDFW Reserve (eBird 2020). The grassland of the Study Area provides foraging and potential nesting habitat.

White-tailed Kite

The white-tailed kite is listed by the CDFW as Fully Protected (CDFW CNDDB 2020). The white-tailed kite inhabits agricultural fields, open grasslands, savannah-like habitats, and riparian and oak woodlands in a relatively narrow band on the west coast of the U.S. and Canada and over large parts of Mexico. An abundance of prey is a requisite habitat feature. The white-tailed kite feeds on rodents, lizards, birds, and insects. Nests sites are variable and may be located in herbaceous open stages of most habitats, from large scrub to trees. The kite makes a stick nest near the top of its nest site, camouflaged from below but open on top. Some nest site fidelity has been observed. Kites may nest semi-colonially. Breeding season occurs from late February to early August. Occasionally kites will double brood in a single season (Dunk 1995, Laursen 2018).

We observed the white-tailed kite during our June and September 2019 surveys foraging over the CDFW Reserve and Struve Slough, and perching in a snag adjacent to Chivos Pond. Trees and larger scrub habitat within the Study Area provide potential nesting habitat for the white-tailed kite. The kite is likely to hunt over the grasslands, agricultural fields, and sloughs. Numerous eBird (2020) records document the kite on the CDFW Reserve, West Branch Struve Slough, and Struve Slough.

Bald Eagle

The bald eagle is state listed as Endangered and is listed as Fully Protected by CDFW (CDFW CNDDB 2020); both nesting and wintering activities are protected. The bald typically breeds in forested areas adjacent to large bodies of water. Nests sites are in mature trees with some habitat edge, relatively close (usually <2 km) to water with suitable foraging opportunities (diversity, abundance, and vulnerability of prey base). For perching, the bald eagle prefers tall, mature coniferous or deciduous trees with a wide view of the surroundings. The bald eagle is known to nest west of the Study Area in lower Harkins Slough and has been observed there in 2019 and 2020 (Pers. Obs. 2020; ebird 2020). The bald eagle may forage over the sloughs and grasslands within the Study Area. Offspring may nest in the vicinity.

Burrowing Owl

The western burrowing owl is a USFWS (2008) Bird of Conservation Concern and a CDFW Species of Special Concern (CDFW 2020c, Shuford and Gardali 2008). Breeding sites are protected as well as some wintering sites, not including wintering sites in Santa Cruz County (CDFW CNDDB 2020). The burrowing owl is found in open areas with sparse, low-growing vegetation (<6 inches around burrows) including annual and perennial grasslands, deserts, open scrub habitats, and agricultural fields with suitable burrows. Burrows of fossorial mammals are an essential component of their nesting and wintering habitat, but they may also use artificial structures such as culverts, openings in asphalt pavement, woody debris/rock piles, and crevices in stacks of straw bales (Poulin et al. 2011). The presence of fossorial mammals, typically ground squirrels, is a good predictor for re-occupancy of habitat, typically in areas that are adjacent to current breeding habitat (Center for Biological Diversity et al. 2003; Shuford and Gardali 2008).

This species has been observed wintering on the grasslands associated with Pajaro Valley High School (PVHS) in 2018, and as a winter migrant at PVHS in December 2019 and at the Watsonville Airport in March 2018 (ebird 2020). Suitable wintering habitat is present on the CDFW Reserve, although much of the Reserve adjacent to Lee Road is dominated by dense Harding grass and stands of other non-native invasive weeds, such as poison hemlock such that this portion of the Reserve provides only degraded potential habitat. In addition, contiguous grassland on the Reserve consists of relatively narrow bands upland from West Struve Slough, which may not provide sufficient area for wintering (Rinkert 2020).

Breeding burrowing owls are extirpated from Santa Cruz County (Center for Biological Diversity (CBD) et al. 2003; Townsend and Lenihan 2007; Trulio 2018); the last known occurrence of breeding in Santa Cruz County is from 1987 at the University of California, Santa Cruz (UCSC) (CBD et al. 2003; Santa Cruz Bird Club 2013). The closest breeding sites are from Santa Clara County, where year-round resident burrowing owls are present, and (likely) San Benito County. These individuals typically winter within 1 mile of breeding sites and show site fidelity during subsequent breeding seasons. During recent (2016 - 2018) studies of historical breeding locations, no new breeding locations were identified in the vicinity (Trulio et al. 2018). Re-establishing breeding in extirpated areas is considered very difficult. Re-establishment efforts primarily focus on suitable areas adjacent to or near current breeding habitat (Trulio 2018).

Migrants from British Columbia, Washington state, and Oregon come to California to winter, utilize current and historic breeding sites as wintering locations, appear to demonstrate some wintering site fidelity, but leave in the late winter/early spring prior to breeding (Trulio et al. 2018). This species is not expected to breed within the CDFW Reserve (Center for Biological Diversity (CBD) et al. 2003; Townsend and Lenihan 2007; Trulio 2018; Rinkert 2020) but may winter within or adjacent to the Reserve (November -March) or occur as a winter migrant.

Tricolored Blackbird

The nesting colonies of the tricolored blackbird are listed as Threatened under the California Endangered Species Act (CESA) (CDFW 2020b) and this species is a USFWS Bird of Conservation Concern (2008). The tricolored blackbird has a very limited geographic range and is nearly restricted to California (Meese and Beedy 2015). This species forms the largest breeding colonies of any North American landbird. Breeding sites require open accessible water; suitable protected nesting substrate, such as spiny, thorny or flooded vegetation; and open-range foraging habitat providing adequate insect prey within a few kilometers, such as natural grassland, shrubland/woodland, or agricultural cropland (Meese and Beedy 2015, Beedy et al. 2017). Breeding colonies are found in a variety of substrates including freshwater marshes dominated by cattail (*Typha latifolia*), bulrush (*Schoenoplectus californicus*), and on the central coast, Himalayan blackberry (*Rubus armeniacus*). Successful reproduction is positively associated with insect abundance in surrounding foraging habitat. Wintering tricolored blackbirds also congregate in flocks of mixed species blackbirds that forage in grasslands and agricultural fields. In February, this species separates into pure tricolored blackbirds flocks that roam and forage until they find a suitable nesting colony location.

The tricolored blackbird is known from the CDFW Reserve, Struve Slough, Hanson's Slough, (CNDDB 2020a,b), and Harkins Slough (ebird 2020). Occurrence records are from outside of breeding season; this species has not been observed breeding in Santa Cruz County since 2008 (Meese 2017). In March 2017, a flock of 150 birds was observed briefly in Harkins Slough; this flock was likely roaming and foraging before selecting a breeding location. The statewide tricolored blackbird breeding surveys have been conducted triennially since 1994 to monitoring this species' numbers. The breeding population on the Central Coast declined by 91% between 2008 and 2014, (Meese 2014); however the 2017 survey showed an increase in birds along the Central Coast due primarily to three colonies: a new 7,500 bird colony in the Panoche Valley of San Benito County, a location that was not surveyed previously; a 3,000 bird colony in Alameda County where fewer than 100 birds had been observed on previous statewide surveys, and a 2,500 bird colony in Monterey County in a previously unknown location (Meese 2017). Recovery has not been observed in other areas. It is unlikely that this species would breed within or near the Project Area within the next few years; however, if the number of tricolored blackbirds breeding on the Central Coast continues to increase, this species may breed in or near the Project Area in the future. This species may occur within West Branch Struve, Struve Slough, or Watsonville Slough outside of breeding season.

Oak Titmouse

The oak titmouse is listed as a 'Bird of Conservation Concern' by the U.S Fish and Wildlife Service (2008). The oak titmouse occurs year-round from southwest Oregon through California to northwestern Baja California, Mexico, where it breeds in low to middle elevations. The oak titmouse inhabits open oak woodlands and pine-oak woodlands with an intermediate canopy cover, but has adapted to locally warm, dry environments without oaks.

The oak titmouse is dependent on dead trees and/or limbs with natural cavities for nesting. They are also known to nest in old woodpecker cavities and/or utilize manmade nest boxes. Females collect nesting material of grass, moss, feathers, shredded bark and other materials, mostly from mid-March through April. After eggs are laid, young birds typically fledge after approximately one month.

Within the Study Area, trees or posts with cavities and hollows, including the non-native forest along the channelized stretch of Watsonville Slough, provide marginal potential nesting habitat for the oak titmouse. We did not observe the oak titmouse during our 2019 surveys, but recent ebird (2020) records document this species' presence in the Project Area: CDFW Reserve (2016), Struve Slough (2020), and the channelized section of Watsonville Slough (2013) which are all within the Project Area (ebird 2020). Trees and posts with cavities, including the non-native forest along Watsonville Slough, provide marginal potential breeding habitat.

Lawrence's Goldfinch

The Lawrence's goldfinch is listed as a Bird of Conservation Concern by the U.S Fish and Wildlife Service (2008). The Lawrence's goldfinch typically occupies arid and open woodlands in the near vicinity of three habitat components: chaparral or other brushy areas; tall annual weed fields; and water source such as stream, small lake, or farm pond. It prefers native plant seeds as a food source, and breeding sites are typically close to water. On the Central Coast, the Lawrence's goldfinch tends to nest in oaks of moderate to small diameter with some lichen; however, this species may use riparian woodland, chaparral, or coastal scrub (Watt et al. 2016; Rosenberg et al. 1991).

We observed an individual Lawrence's goldfinch during 2019 surveys perching on the fenceline and foraging over the grassland and coastal scrub habitats of the CDFW Reserve and grasslands west of Lee Road. The Study Area provides potential nesting habitat within the CDFW Reserve and along the margins of Struve Slough; however, nesting on the central coast is erratic. This species is known from Struve Slough and Harkins Slough (ebird 2020).

Grasshopper Sparrow

The nesting grasshopper sparrow (*Ammodramus savannarum)* is a CDFW Species of Special Concern (CDFW 2020c, Shuford and Gardali 2008). The California breeding range for grasshopper sparrow (*Ammodramus savannarum)* is a very narrow band along the coast. The grasshopper sparrow is associated with short to medium-height grasslands, often with patchy bare ground, and may be found in pastures and agricultural fields. In the west, this species utilizes lusher grasslands with shrub cover. The grasshopper sparrow nests on the ground in grassland habitats between April and June and forages on insects and seeds (Vickery 1996).

We did not observe the grasshopper sparrow during out 2019/2020 surveys. The grasshopper sparrow may inhabit the grassland habitats of the Study Area. Local observations are from along upper West Branch Struve Slough, in the CDFW Reserve (August 2018 and September 2020), and north of Pajaro Valley High School (May 2014); and from the Harkins Slough and Watsonville Slough confluence (May 2013) with more observations from the open space lands east of Watsonville (eBird 2020).

Other Nesting Avian Species

Common avian species (**Appendix D**) are likely to nest within the CDFW Reserve, West Branch Struve Slough, Struve Slough, Watsonville Slough, and the adjacent riparian and marsh habitats. The non-native forest along the channelized section of Watsonville Slough is also likely to support breeding birds. A comprehensive breeding bird survey was not conducted because nest sites for most avian species are dynamic, and nest locations vary from year to year; however, incidental observations of breeding activity are noted in **Appendix D**.

MAMMALS

The California Fish and Game Codes (CFGC) protect non-listed bat species and their roosting habitat, including individual roosts and maternity colonies. These include CFGC Section 86; 2000; 2014; 3007; 4150, along with several sections under Title 14 of California Code of Regulations (CCR).

Bat Species

Common bat species, such as California myotis, Yuma myotis and big brown bat, are likely to occur in the riparian and non-native forest habitats. The CFGC protects non-listed bat species and their roosting habitat, including individual roosts and maternity colonies (§ 86, 2000, 2014, 3007, and 4150) along with several sections under Title 14 of the CCR.

The typical breeding season for bats is from May to September. Depending on the species, female bats congregate in small or large numbers to form maternity colonies to give birth and rear their young over the spring/summer season, while males roost separately as individuals or in small bachelor groups. Juvenile bats begin flying by the fall season to forage and prepare for migration. Also depending on the species, males and females communally roost during the fall to breed before and during migration or hibernating through the winter season (Brown et al. 1996).

San Francisco Dusky-footed Woodrat

The San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) is considered a CDFW Species of Special Concern (CDFW 2020c). The woodrat is associated with riparian, oak woodland, redwood forest, and chaparral or other scrub habitats. The woodrat builds houses on the ground or in trees, utilizing understory, woody debris, human debris, structures or buildings. Houses range in size from 3 to 8 feet across at the base, up to 6 feet tall, and up to approximately 30 feet above the ground in tree canopies. The woodrat tends to live in colonies of 3 to 15 or more houses, with the inhabitants often representing multiple generations. Houses have food caches, latrines, and often *Peromyscus* sp. nests and/or amphibians within. The woodrat is mostly nocturnal, leaving its house to forage on different parts of the same woody plant seasonally including leaves, bark, seeds and fruit of coast live oak, coffeeberry, poison oak, elderberry, but also grasses, flowers, and fungi. The woodrat breeds from December to September with a peak in mid-spring (Sakai and Noon 1993).

Within the Study Area, the coastal scrub, arroyo willow riparian, and non-native/eucalyptus forest provide suitable habitat for the woodrat.

4.5 *Wildlife Movement*

Providing functional habitat connectivity between natural areas is essential to sustaining healthy wildlife populations, allowing for the continued dispersal of native plant and animal species and for genetic biodiversity, and is considered under the California Environmental Quality Act (CEQA).

Corridors for wildlife movement (also dispersal corridors, wildlife corridors, or landscape linkages) are features whose primary function is to connect at least two isolated habitat areas (Bond 2003). A basic description of the functions of corridors is as follows:

> *Corridors provide avenues along which (1) wide ranging animals can travel, migrate, and meet mates…(2) plants can propagate…(3) genetic interchange can occur…(4) populations can respond to environmental change…[and] (5) locally extirpated populations can be replaced from other areas* (Beier and Loe 1992).

In the interface between open spaces and developed areas, corridors can provide links between different types of habitat areas, including (but not limited) to core habitat areas, supportive natural landscapes or habitat patches, and linear habitats. Core habitat areas are undeveloped areas or open spaces that support the viability of rare plant or animal populations or consist of exemplary natural communities. Providing functional connectivity between core habitats through corridors is essential to sustaining healthy wildlife populations and allowing for the continued dispersal of native plant and wildlife species.

Other areas may lack the requisite structural or spatial heterogeneity to be considered core habitat, but may provide relictual or small areas of native habitats, as well as opportunities for wildlife. These areas are considered habitat patches or supportive natural landscapes. The larger sloughs and the surrounding uplands, including the CDFW Reserve and portions of the LTSCC's Watsonville Slough Farm, would be considered habitat patches in that they are surrounded by development and agricultural areas, without adequate connectivity to other larger more intact open spaces in the vicinity and region. The tree stands, coastal scrub, riparian areas, and marshes adjacent to the open waters of the sloughs provide cover, shelter, roosting, and nesting habitats for wildlife species that may utilize the slough system.

Creeks, drainages, and associated riparian habitats would be considered linear habitats. Linear habitats in agricultural or developed landscapes provide habitat for native plants, canopy cover, opportunities for foraging, refuge from predators, as well as the opportunity to disperse (Beier and Loe 1992). The smaller fingers of the sloughs and their associated riparian habitats would be considered linear habitats.

Marginal connectivity exists between the sloughs and Ellicott Reserve to the north through drainages, hedgerows, and the somewhat permeable barrier provided by agricultural fields. Agricultural fields provide the only semi-permeable links that allow movement from the sloughs to the Pajaro River, Corralitos Creek, or the open spaces in Freedom and Corralitos.

Lee Road, northwest of Struve Slough would be considered a barrier to wildlife movement; however, this section of Lee Road dead ends at Struve Slough and traffic is currently primarily limited to vehicles accessing Watsonville Slough Farm and Fitz Fresh Mushrooms Farm, which receive less business during nighttime hours, when wildlife are more likely to move. Therefore Lee Road is somewhat permeable to wildlife movement

Wildlife that are moving through the Study Area and surroundings are likely to use the sloughs and their riparian habitat as linear corridors because of the shelter, cover, food and water resources these areas provide; however, some species are likely to cross Lee Road, to move between the CDFW Reserve, Chivos Pond and Hanson's Slough (on Watsonville Slough Farm property). These species include bobcat, coyote, deer, skunks, raccoons, and rabbits. In addition, the CRLF and other amphibians are known to move directly between aquatic resources, across intervening roads, ruderal areas and agricultural fields.

5.0 POTENTIAL IMPACTS/AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

The proposed Lee Road Trail has been designed to minimize impacts to biological resources. The trail would be positioned adjacent to the existing developed footprint of Lee Road (and a short segment along Harkins Slough Road) with the following exceptions:

- a maximum 20-foot encroachment along the margins of the CDFW Reserve, including along Lee Road to accommodate the pedestrian/bicycle trail, and along Harkins Slough Road to accommodate road widening necessary for the bicycle lane (Lee Road North);
- construction of the bridge on the seasonally to perennially submerged portion of Lee Road within Struve Slough (Struve Slough Bridge);
- replacement of the channelized Watsonville Slough culvert under Lee Road (Lee Road South); and
- adding chip-seal to the existing trail, between Lee Road and under the Highway 1 underpass along channelized Watsonville Slough, to connect with the Manabe-Ow Trail (Watsonville Slough).

Below we have assessed potential impacts of the proposed project to biological resources and identified avoidance, minimization, and mitigation measures to reduce potential impacts to less than significant. Additional measures may be required by agency representatives, including USFWS, the Regional Board, CDFW, the County of Santa Cruz, and the City of Watsonville.

The discussion also addresses the Lee Road North – West Side Design Option B (whereby the trail would be on the west side of Lee Road instead of the east side). The Lee Road South design option (whereby the sidewalk south of the Watsonville Slough channel crossing would be on the east side of Lee Road instead of the west side) would have no impacts to biological resources and therefore is not addressed further.

5.1 *Sensitive Plant and Wildlife Species*

Would the project:

	Potentially Significant	Less Than Significant with Mitigation	Less Than Significant	No Impact
1. ***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 Wildlife, or U.S. Fish and Wildlife Service?***	☐	☒	☐	☐

No special-status plant species are expected to occur within the Study Area. The following sensitive wildlife species are present or have potential to occur within the Study Area: California red-legged frog (CRLF), western pond turtle (WPT), northern harrier, white-tailed kite, bald eagle, western burrowing owl (wintering or winter migrant only), tri-colored blackbird (non-breeding), grasshopper sparrow, Lawrence's goldfinch, oak titmouse, and San Francisco dusky-footed woodrat. Birds of prey, other common bird species, and common bat species are likely to utilize the Study Area for breeding.

An overview of these species has been provided in the sections above, and potential project-related impacts are described below. Avoidance, minimization, and mitigation measures are identified for the protection of these species and/or their habitat and are listed below. These measures will reduce project-related impacts to less-than-significant.

BOTANY

No sensitive plant species were identified within the Study Area, nor are they expected to occur. No impacts to sensitive plant species are anticipated to result from the proposed Project. We recommend the following Best Management Practices to further reduce impacts to native vegetation.

- Minimize removal or disturbance of existing vegetation outside of the footprint of project construction activities. To the maximum extent feasible, confine project activities and operation of equipment and vehicles, including site access and parking, to designated staging areas.
- Prior to staging equipment on-site, clean all equipment caked with mud, soils, or debris from off-site sources or previous project sites to avoid introducing or spreading invasive exotic plant species. When feasible, remove invasive exotic plants from the Project Area.

CALIFORNIA RED-LEGGED FROG

The California red-legged frog (CRLF) is listed as threatened under the federal Endangered Species Act (USFWS 1996) and is a California Species of Special Concern (Thompson et al. 2016, CDFW 2020c). The CRLF is known to utilize the aquatic habitats within and near the Study Area and may utilize the adjacent upland, movement, and/or dispersal habitats. The proposed Trail alignment is located within Critical Habitat for CRLF (USFWS 2010).

To avoid unlawful "take" of CRLF, during project permitting under Section 404 of the Clean Water Act, it is anticipated that the Corps will initiate formal consultation with USFWS. This biotic assessment will be provided to USFWS at that time. We anticipate that USFWS will generate a Biological Opinion (BO) for the project under Section 7 of the Endangered Species Act; or utilize the programmatic BO between the Corps and USFWS, if the project meets the criteria for this permitting mechanism. The BO will describe protective measures and conditions for the Project, including the conditions for a USFWS-approved biologist to handle and relocate CRLF that move into the Project Area. With the approval of USFWS, the biologist will identify relocation sites for CRLF. The Biological Opinion will also address trail operation and associated potential impacts.

IMPACT BIO-1A: The Project could result in adverse effects to California Red Legged Frog during construction and operation.

Construction

The proposed Project (and Lee Road North West Side Design Option B) may result in temporary impacts to CRLF during trail construction, including grubbing and vegetation removal, grading, work within and adjacent to Struve Slough, and equipment and vehicle access.

Work occurring directly in CRLF habitat may temporarily reduce available CRLF habitat in Struve Slough, non-native grassland and coastal scrub associated with the CDFW Reserve, riparian and marsh habitats. Work occurring directly in Struve Slough and Watsonville Slough may result in direct take of CRLF or temporarily disrupt potential CRLF in the slough through increased noise levels, vibrational, and visual disturbances, and barriers to movement. Construction activities within the sloughs would occur during the dry season, when the water level is lowest. Dewatering of Struve Slough for up to 3 to 4 months is anticipated to be necessary in order to install the bridge piers. Approximately 50% of the existing asphalt would be removed to construct the bridge supports. Clean gravel with passive gravity culverts would be placed on top of the existing roadway within the Slough. Wildlife passage may be possible through the culverts, but aquatic movement of CRLF through Struve Slough, if present, is expected to be disrupted. This species would be able to cross the gravel bar for passage, but may be more vulnerable to predation (the gravel bar would be connected to terrestrial areas on each side of the slough and would lack protective cover). In addition, construction activities may temporarily degrade potential CRLF habitat in and adjacent to the construction footprint through the introduction of sediment and potential unanticipated releases of equipment fuel, hydraulic fluid, or other potentially hazardous substances used in construction equipment; and through vegetation removal, grubbing, and disturbance in aquatic, upland and dispersal habitats.

CRLF may move through the Project Area during Trail construction, including across Lee Road. Construction equipment, grading, and earth moving could cause direct injury or mortality to CRLF, as well as harassment though increased noise levels, vibrational, and visual disturbances, and barriers to movement and dispersal. These activities could interfere with important CRLF life events, including movement to breeding habitat, breeding, foraging, dispersal, and movement to aquatic non-breeding habitats.

During construction, erosion and sediment control measures to reduce sediment and chemical-laden runoff introductions would reduce potential impacts to CRLF and habitat to less-than-significant.

Operation

The proposed Trail (and Lee Road North West Side Design Option B) would introduce increased pedestrian and bicycle use, as well as unauthorized access into the east side of the CDFW Reserve. It could also result in increased vehicle traffic, more likely on the weekend when the trail is expected to be used more by recreationists, rather than students traveling to Pajaro Valley High School. Increased presence of vehicles and trail users may result in increased harassment, injury, and mortality of CRLF through trampling, vehicle and bicycle strikes, and interference with CRLF movement, dispersal, and other life events. Currently unpermitted access is mostly confined to the west side of the Reserve near the Highway 1 overpasses. New easier access to the east side of CDFW Reserve via the proposed Struve Slough Bridge could increase unpermitted access to the Reserve and illegal encampments, particularly in the areas that provide shelter such as the coastal scrub and riparian habitats. The increased human presence through trail use and unauthorized access is likely to degrade CRLF habitat through trampling, compaction of small mammal burrows, alteration of the native vegetation, increased trash, urine and fecal matter, and pollution of aquatic habitat. On-going maintenance activities along the alignment, such as mowing, pruning, and trail repair could also result in direct impacts to CRLF and Critical Habitat.

Regular patrol by local law enforcement and regular maintenance visits by County of Santa Cruz and City of Watsonville Public Works Departments would deter and reduce unpermitted access and degradation of CRLF habitat. In addition, implementation of the following CRLF protection measures will reduce potential impacts to less-than-significant:

- During project construction activities, employ avoidance measures, including biological monitoring for California red-legged frog (CRLF) and other sensitive wildlife species:
    - Prior to initiation of construction activities, a USFWS- and CDFW-approved biologist shall prepare a construction monitoring plan that identifies all areas to be protected with exclusion fencing on a 1:1500 scale map (or similar scale determined to be practicable), and all areas requiring monitoring by a USFWS- and CDFW-approved biologist.
    - Prior to initiation of construction activities, a USFWS-approved biologist shall conduct an environmental training for all construction personnel. The training shall include a description of CRLF and its habitat, and measures to protect CRLF, and other sensitive wildlife species known or with potential to occur (WPT, nesting avian species, SF dusky-footed woodrat, and roosting bats) in the Project alignments and surroundings.
    - Prior to initiation of construction activities, the construction contractor shall install exclusion fencing (solid silt fencing) in specified areas along the project boundaries, 2.0 feet below grade and 3.0 feet above grade, with wooden stakes at intervals of not more than 5.0 feet. The fence shall be maintained in working order for the duration of construction activities. The USFWS-approved biologist or designated trained construction monitor shall inspect the fence daily and notify the construction foreman when fence maintenance is required. The fence shall allow for wildlife passage across the Project Area at intervals to be determined in conjunction with USFWS and CDFW.
    - If feasible, construction activities within and adjacent to the CDFW Reserve, Struve Slough, and Watsonville Slough shall take place during the dry season and before the first rain of the season, especially vegetation removal and work in or near Struve Slough. Avoid working at night or during rain events when special-status amphibians and mammals are generally more active. Consult weather forecasts from the National Weather Service at least 72 hours prior to performing work.
    - During vegetation removal in or adjacent to the CDFW Reserve and construction within or adjacent to Struve Slough and Watsonville Slough, with the authorization of the USFWS and CDFW, the agency-approved biological will be present (or on call) to relocate CRLF (and WPT) as needed. The approved biologist shall have the authority to stop work that may result in the “take” of a special-status species. The biologist will thoroughly check all vegetation for CRLF, WPT, and other wildlife species prior to vegetation removal activities.
    - The approved biologist or construction monitor will check under all equipment for wildlife before use. If any special-status wildlife is observed under equipment or within the work area, the approved biologist will be permitted to handle and relocate it.
    - At the end of each work day, excavations shall be secured with a cover, or a ramp installed to prevent wildlife entrapment.
    - All trenches, pipes, culverts or similar structures shall be inspected for animals prior to burying, capping, moving, or filling.
- To minimize take of CRLF during trail maintenance activities, restrict mowing and pruning to the dry season, after April 15 if feasible, or wait at least 2 weeks after March or April rains.
- To minimize vehicle strikes of CRLF along Lee Road, restrict parking along Lee Road to daytime hours by installing signs identifying legal parking hours.

- To minimize take of CRLF and degradation of its habitat during trail operation, develop a Conceptual Mitigation Plan (CMP) for CRLF and other sensitive resources. The details of this program will be developed in consultation with USFWS and CDFW, with input from collaborative partners Watsonville Wetlands Watch and, if determined to be appropriate and beneficial, the Land Trust of Santa Cruz County. The program will include:
  - An agency-approved biologist will identify and map occupied and potential CRLF aquatic (breeding and non-breeding), upland, refuge, movement, and dispersal habitat within and adjacent to the CDFW Reserve, proposed Struve Slough Bridge crossing, and channelized Watsonville Slough.
  - Strategies to protect these areas from take of individual CRLF or degradation associated with trail operation
  - The approved biologist will conduct monitoring of CRLF habitat (at a frequency to be determined in consultation with the agencies) to ensure degradation of habitat is not occurring.
  - The monitor will confirm that protective maintenance measures are being implemented, including restricting mowing and pruning to the dry season (typically from April 15 to October 15).
  - In the event that the monitoring biologist identifies degradation of CRLF habitat, the program will include provisions for adaptive management to modify and/or supplement existing mitigation measures.
  - Humane removal of non-native predators in off-channel ponds or other potential breeding ponds lacking direction connection to the larger slough system.
  - Local law enforcement and public works representatives will enforce parking restrictions and immediately alert Watsonville Wetlands Watch, CDFW Reserve Representatives, and/or the assigned monitoring biologist in the event that illegal encampments or other degradation of CRLF habitat is observed.

  The program may include:
  - In conjunction with mitigation for displaced wetlands or other sensitive habitats (described in Impact BIO-2 and BIO-3 below), creation or enhancement of off-channel breeding habitat within the CDFW Reserve or on Watsonville Slough Farm, and planting of adjacent refuge habitat with native vegetation.

WESTERN POND TURTLE

The western pond (WPT) is a CDFW Species of Special Concern (CDFW 2020c, Thompson et al. 2016). The CNDDB documents an individual WPT is in Struve Slough in 2007 (CNDDB 2020a,b). In 2019, a gravid female was found on Main Street by Struve Slough and was relocated back into Struve Slough with suitable nesting habitat nearby (Reis 2020). This species is also known from Pinto Lake and the Pajaro River (Mori 2018; CNDDB 2020a,b). West Branch Struve Slough, Struve Slough, and adjacent uplands provide suitable habitat for this species. If present, WPT could use Struve Slough and West Struve Slough for foraging, basking, and movement; and the grasslands of the CDFW Reserve for nesting. Nesting habitat is present on the CDFW Reserve, especially northeast and east of West Branch Struve Slough where topography and sun exposure are suitable for nesting. Since observations of this species in Struve Slough and West Branch Struve Slough are few [based both on CNDDB records (2020a, b) and communications with local experts] it is possible, but unlikely that WPT would move through the uplands of CDFW Reserve within the proposed Project Area. This area immediately adjacent to Lee Road and provides marginal nesting habitat.

IMPACT BIO-1B: The proposed Project (and Lee Road North West Side Design Option B) may result in temporary impacts to WPT, if present, during trail construction, including grubbing and vegetation removal, grading, work within and adjacent to Struve Slough, and equipment and vehicle access.

Work occurring directly in Struve Slough may temporarily disrupt potential WPT basking, foraging and movement in the slough through increased noise levels, vibrational, and visual disturbances, and barriers to movement. Construction activities within the slough would occur during the dry season, when the water level is lowest; however, dewatering of Struve Slough for up to 3 to 4 months is anticipated to be necessary in order to install the bridge piers. Clean gravel with passive gravity culverts would be placed on top of the existing roadway within the Slough. Wildlife passage may be possible through the culverts, but aquatic movement of WPT through Struve Slough, if present, is expected to be disrupted. This species would be able to cross the gravel bar for passage, but may be more vulnerable to predation (the gravel bar would be connected to terrestrial areas on each side of the slough and would lack protective cover). In addition, construction activities would temporarily degrade potential WPT habitat in and adjacent to the construction footprint through the introduction of sediment and potential unanticipated releases of equipment fuel, hydraulic fluid, or other potentially hazardous substances used in construction equipment.

If present in West Branch Struve Slough, female WPT may move through the Project Area along the CDFW Reserve during construction, although movement in this direction is unlikely based on the poor quality of potential nesting habitat. Construction equipment, grading, and earth moving could cause direct injury or mortality to WPT, as well as harassment though increased noise levels, vibrational, and visual disturbances, and barriers to movement and dispersal. These activities could interfere with WPT breeding.

Trail operation is not expected to interfere with WPT life events based on the location of the trail along Lee Road where minimal if any WPT upland movement would occur. The proposed bridge would provide a safe viewing platform for trail users that is above Struve Slough and is not expected to interfere with WPT basking or movement.

During construction, erosion and sediment control measures would be installed and maintained to reduce sediment and chemical-laden runoff introductions. These best management practices have been incorporated into Project plans and would reduce potential impacts to WPT and habitat to **less-than-significant**. The following measures will further reduce potential impacts to WPT to less than significant.

- See measures listed for CRLF under Impact BIO-1A above, including a construction monitoring plan, exclusion fencing, environmental training, timing of work (dry season) in Struve Slough, and biological monitoring and agency-approved relocation (if necessary).

AVIAN SPECIES

Both sensitive and common avian species (such as those species listed in **Appendix D**) are likely to utilize the habitats of the Study Area and the surrounding area for nesting activities. The northern harrier and grasshopper sparrow (if present) may utilize the non-native grasslands within the CDFW Reserve for breeding. The bald eagle, the white-tailed kite, and other raptors, including owls, may utilize larger trees near the Study Area for nesting. The Lawrence's goldfinch may utilize riparian trees or coastal scrub. The oak titmouse may nest within the Study Area in trees or posts with cavities.

The western burrowing owl may utilize the CDFW Reserve grasslands for wintering (November – March) (although unlikely, based on the limited potential wintering habitat of marginal quality adjacent to Lee

Road) or the burrowing owl may occur as a winter migrant; however, construction along the Reserve would be restricted to the dry season (April 15 – October 15) and is therefore not expected to impact wintering species. The burrowing owl is considered extirpated from breeding in Santa Cruz County (CBD et al. 2003; Townsend and Lenihan 2007; Trulio 2018). While the wintering activities of the burrowing owl are not legally protected in Santa Cruz County, during construction, measures to protect potential wintering or winter migrant individuals and potential habitat will be incorporated as described below.

The tricolored blackbird is known to occur within and near the Project Area in small numbers during the winter and, on one occasion (March 2017), a roaming flock was observed in Harkins Slough. This species has not bred in Santa Cruz County since 2008 (Meese 2017). It is unlikely that a nesting colony of this species will utilize the Project Area or immediate vicinity in the short term; however, if Central Coast numbers of this species continue to increase, a breeding colony may utilize the Project Area or vicinity in the future. Wintering individuals are not legally protected; however, both winter and spring preconstruction surveys efforts will include this species to further ensure adequate protective measures for this species are in place.

The grasslands, coastal scrub, riparian, marsh, and non-native forest habitats within the Study Area all provide potential nesting habitat for common avian species.

Breeding bird season is typically February 1 to September 15. All nesting birds of prey (i.e., hawks and owls), other native nesting birds and their occupied nests, and individual birds of prey and passerine birds are protected by the MBTA and CFGC 3503 and 3503.5. Sensitive bird species receive additional protections, primarily for nesting activities with some species (such as “Fully Protected” species) receiving additional protection for wintering and foraging activities.

IMPACT BIO-1C: Project construction activities associated with the proposed Trail (and Lee Road North West Side Design Option B) during the avian breeding season (February 1 to September 15) may disrupt breeding activities, cause nest abandonment or failure, or directly harm or cause mortality to nesting birds, eggs, and young located within the Project Area and surroundings. Limited scrub and grassland removal may result in direct harm or mortality to nesting avian species and loss of potential nesting habitat.

Construction activities, including grubbing and vegetation removal, grading/earth moving, excavation, and equipment and vehicle access will generate increased dust, noise, and vibrational and visual disturbances. These activities may disrupt sensitive and common bird species nesting within the Study Area.

Construction activities may injure or kill wintering or winter migrant burrowing owls, if present, and destroy fossorial mammal burrows that provide potential wintering habitat.

Implementation of the following measures will reduce potential impacts to less-than-significant:

- The avian breeding season occurs between February 1 and September 15. If feasible, perform vegetation removal activities within or near the CDFW Reserve and along Watsonville Slough outside of breeding bird season to avoid direct harm or mortality to potential nesting bird species and other sensitive biological resources.
- For all project activities initiated during the breeding bird season, or if construction activities lapse for a period of two weeks or more during breeding bird season, a qualified biologist will conduct a breeding bird survey for nesting birds, including raptors. Surveys will be conducted within 15 days, prior to beginning project activities and will include all work, staging, and access areas and a minimum buffer radius of 400 meters (or more as determined by the resource agencies). The survey will include potential habitat for raptors and sensitive and common nesting avian species known to occur within

the Study Area [grassland, coastal scrub, arroyo willow riparian, freshwater marsh, non-native forest/eucalyptus grove.

- If no nesting sensitive or common avian species are observed during breeding bird surveys no additional measures would be required.
- If common nesting birds are observed within or adjacent to [within 90 meters (300 feet)] vegetation proposed for removal, postpone vegetation removal activities until young have fledged to avoid direct harm or mortality of nesting birds and/or establish buffers depending on the activity and appropriate to the species, such as protective buffers recommended in PG&E et al. (2015);
- Sensitive bird species, if nesting in or near the Project Area, will be given special consideration and may require additional protective measures as determined through consultation with the relevant agency (USFWS or CDFW), such as protective buffers recommended in PG&E et al. (2015):
  - bald eagle: 400 meters (1,300 feet);
  - northern harrier, white-tailed kite, and other raptors: 90 meters (300 feet);
  - tricolored blackbird colony (unlikely): 90 meters (300 feet);
  - Lawrence's goldfinch, grasshopper sparrow: 25 meters (75 feet); and
  - oak titmouse: 15 meters (50 feet)

The following measures will be implemented as Best Management Practices to protect wintering sensitive bird species, if present:

- If any work is performed within or adjacent to the CFDW Reserve, Struve Slough, or Watsonville Slough during the burrowing owl and tricolored blackbird wintering period (November – March), conduct a survey for these species. The survey will be conducted by a qualified biologist[16] and include the project area and suitable habitat within 150 meters (490 feet).

  If burrowing owls are detected:
  - place visible markers near occupied burrows and fence off suitable habitat;
  - avoid direct destruction of burrows, and
  - include the burrowing owl in the environmental training for construction personnel (see protective measures for CRLF above).

CDFW may require additional protective measures for wintering tricolored blackbirds, if observed.

- To avoid potential burrowing owl habitat, to the greatest extent feasible, avoid destruction of fossorial mammal burrows during construction.

[16] A qualified burrowing owl biologist will have:
1. Familiarity with the species and its local ecology;
2. Experience conducting habitat assessments and non-breeding and breeding season surveys, or experience with these surveys conducted under the direction of an experienced surveyor;
3. Familiarity with the appropriate state and federal statutes related to burrowing owls, scientific research, and conservation; and
4. Experience with analyzing impacts of development on burrowing owls and their habitat.

SAN FRANCISCO DUSKY-FOOTED WOODRAT

The San Francisco dusky-footed woodrat is considered a CDFW Species of Special Concern (Bolster 1998, CDFW 2020c). During field surveys, no woodrat houses were identified in the immediate Project Area. However, coastal scrub and arroyo willow riparian scrub habitats, especially those adjacent to aquatic features and other edge habitats, provide potential habitat for this species.

IMPACT BIO-1D: If removal of coastal scrub and arroyo willow riparian is determined to be necessary, individual woodrats present in this habitat or their houses may be directly impacted. Construction associated with the proposed Trail (and Lee Road North West Side Design Option B) activities may directly impact woodrat individuals if present within the work area.

Implementation of the following measures will reduce potential impacts to less-than-significant:

- Prior to construction, a qualified biologist shall conduct a preconstruction survey for woodrat houses, and clearly flag all houses within the construction impact area and immediate surroundings.
- The construction contractor shall avoid woodrat houses to the extent feasible by installing a minimum 10-foot (preferably 25-foot) buffer with silt fencing or other material that shall prohibit encroachment. If this buffer and avoidance is not feasible, the qualified biologist shall allow encroachment into the buffer, but Reserve microhabitat conditions such as shade, cover and adjacent food sources.
- If avoidance of woodrat houses is not possible, in coordination with CDFW, a qualified biologist shall develop and implement a San Francisco Dusky-footed Woodrat Relocation Plan such as that provided in Appendix F.

See also avoidance and monitoring measures, as listed for CRLF under Impact BIO-1 above.

BATS

Common bats may utilize non-native forest and mature riparian habitats for roosting. Bat maternity roosting occurs typically between May 1 and September 1, and winter hibernacula (shelter occupied during the winter by a dormant animal) for many bat species are found between November 1 and February 15. All roosting bats, including individual roosts, winter hibernacula, and maternity roosts, are protected under California Fish and Game Codes (2016).

IMPACT BIO-1E: One large (72-inch DBH) eucalyptus tree is proposed for removal to allow installation of the proposed southern Struve Slough Bridge approach. In addition, up to 0.017 acres of arroyo willow riparian adjacent to the southern bridge approach would be removed and up to 0.031 acres would be limbed or pruned to allow access for the construction of the piers, bridge abutments and the bridge. If roosting bats are present in trees proposed for pruning, limbing, or removal, direct harm or mortality of bats may occur. Noise, vibrations, dust, and other disturbances associated with trail construction activities may disrupt bat maternity roosts, if present.

Implementation of the following measures will reduce potential impacts to less-than-significant:

- If feasible conduct limbing/tree removal operations between September 15 and November 1 to avoid bat maternity roosts and winter hibernacula, as well as other sensitive biological resources.
- To avoid impacts to individual roosts, winter hibernacula, and maternity roosts, during all months, prior to limbing/tree removal, a qualified biologist shall conduct a pre-construction survey for bats to determine if crevice or foliage roosting bats are present, as follows:

- A qualified biologist shall determine if bats are utilizing the site for roosting. For any trees/snags that could provide roosting space for cavity or foliage-roosting bats, potential bat roost features shall be thoroughly evaluated to determine if bats are present. Visual inspection and/or acoustic surveys shall be utilized as initial techniques. If roosting bats are found, the biologist shall develop and implement acceptable passive exclusion methods in coordination with or based on CDFW recommendations. If feasible, exclusion shall take place during the appropriate windows (September 1and November 1) to avoid harming bat maternity roosts and/or winter hibernacula. (Authorization from CDFW is required to evict winter hibernacula for bats).
- If established maternity colonies are found, in coordination with CDFW, a buffer shall be established around the colony to protect pre-volant young from construction disturbances until the young can fly; or implement other measures acceptable to CDFW.
- If a tree is determined not to be an active roost site for roosting bats, it may be immediately limbed or removed as follows:
  - If foliage roosting bats are determined to be present, limbs shall be lowered, inspected for bats by a bat biologist, and chipped immediately or moved to a dump site. Alternately, limbs may be lowered and left on the ground until the following day, when they can be chipped or moved to a dump site. No logs or tree sections shall be dropped on downed limbs or limb piles that have not been in place since the previous day.
- If the tree is not limbed or removed within four days of the survey, the survey efforts shall be repeated.

5.2 *Sensitive Habitats/Vegetation Removal*

2. ***Have a substantial adverse effect on any riparian habitat or sensitive natural community identified in local or regional plans, policies, regulations (e.g., wetland, native grassland, special forests, intertidal zone, etc.) or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?***	☐	☒	☐	☐

Four sensitive habitats, (coastal scrub, palustrine emergent wetland, arroyo willow riparian forest, and aquatic) occur within the Study Area (Figure 4). The Study Area also includes habitats that support sensitive wildlife species [such as CRLF (aquatic habitat and upland, movement and dispersal habitat adjacent to aquatic habitat), San Francisco dusky-footed woodrat and special-status bird species] and areas of high biological diversity, such as edge habitats. Within the Study Area edge habitats occur between coastal scrub and non-native grassland habitats on the CDFW Reserve and along the edge of arroyo willow riparian habitat east of Struve Slough. For the proposed trail and West Side Option B, the temporary and permanent impacts by habitat type are summarized in **Table 2**, (sensitive habitat types are shown in bold) and depicted in **Appendix G**.

Coastal scrub is considered ESHA by the County of Santa Cruz Local Coastal Program (LCP) (Santa Cruz County 1994) and County of Santa Cruz sensitive habitat (Santa Cruz County Code 16.32). The *Rubus* Alliance (Coast brambles; G4/S3) is also considered a sensitive habitat by CDFW. Within the Study Area, coastal scrub is located primarily on ridgetops and east facing slopes above West Struve Slough within the CDFW Reserve.

Table 2. Lee Road Trail Permanent and Temporary Impacts to Habitat Types.

Habitat Type	Proposed Project	
	Permanent Impacts	Temporary Impacts
Agriculture	0.039	0
Aquatic	**0.003**	**0.497**
Arroyo Willow Riparian	**0.017**	**0.031**
Coastal Scrub (*Baccharis pilularis* Alliance)	**0.077**	**0.013**
Coastal Scrub (*Rubus* Alliance)	**0**	**0.015**
Developed-Landscaped	2.219	0.219
Freshwater Marsh	**0.017**	**0.121**
Non-native Forest	0.188*	0.091
Non-native Grassland	1.384	1.057
Ruderal	0.226	0.697
Seasonal Wetland	**0.005**	**0.009**
Seep	**0.001-0.010**	**0-0.010**
Total	4.175	2.761
Total Sensitive Habitats	**0.120-0.129**	**0.686-0.696**
Habitat Type	**Option B**	
	Permanent Impacts	**Temporary Impacts**
Agriculture	0.311	0.423
Aquatic	**0.003**	**0.497**
Arroyo Willow Riparian	**0.017**	**0.031**
Coastal Scrub (*Baccharis pilularis* Alliance)	**0.077**	**0.013**
Coastal Scrub (*Rubus* Alliance)	**0**	**0.015**
Developed-Landscaped	2.361	0.230
Freshwater Marsh	**0.017**	**0.121**
Non-native Forest	0.188*	0.091
Non-native Grassland	0.842	0.417
Ruderal	0.857	0.367
Seasonal Wetland	**0.002**	**0.005**
Seep	**0.001-0.010**	**0-0.010**
Total	4.676	2.219
Total Sensitive Habitats	**0.117-0.126**	**0.682-0.692**

Note: Sensitive Habitats are in bold

* **Permanent impact from trail construction is largely located below the canopy of existing trees along Watsonville Slough and may require periodic trimming and/or maintenance but will not require the full removal of any trees.**

Arroyo willow riparian forest is considered an ESHA and sensitive habitat type by the County of Santa Cruz LCP, Sensitive Habitat Ordinance, and Riparian Corridor and Wetlands Protection Ordinance (Santa Cruz County Code 16.30) (the latter discussed in further detail in the subsequent section). The *Salix lasiolepis* Association (62.201.01) is also described as a sensitive natural community by CDFW. These areas are regulated as wetland habitats by the California Coastal Commission due to dominance by arroyo willow, a facultative wetland (FACW) species. Riparian communities are considered sensitive habitat due to their value to wildlife, limited distribution, and decreasing acreages statewide.

The County of Santa Cruz Sensitive Habitat Protection ordinance requires mitigation for any unavoidable environmental impacts to sensitive habitats, including degradation, caused by the project. Avoidance and minimization measures are recommended for the protection of these habitats.

IMPACT BIO-2: Trail construction and operation may adversely affect riparian habitat and sensitive natural communities.

Construction

Coastal Scrub. Coastal scrub is present on the CDFW Reserve. Project construction (including for West Side Design Option B) would permanently impact 0.077 acres (3,350 square feet) of coastal scrub (*Baccharis pilularis* Alliance). Construction disturbance would temporarily impact an additional 0.044 acres (1,900 square feet) of coastal scrub (*Bachharis pilularis* and *Rubus* Alliances). Equipment access, grubbing, vegetation removal, excavation, grading, and trail construction may result in temporary and permanent impacts to coastal scrub. Any vegetation removed would be replaced in-kind onsite. If permanent loss occurs, this impact would be mitigated through in-kind replacement or enhancement in close proximity to the area of disturbance.

Arroyo Willow Riparian Habitat. Arroyo willow riparian habitat occurs at the southern margins of Struve Slough. Approximately 0.017 acres (740 square feet) of arroyo willow riparian is anticipated to be permanently displaced by the proposed project (including for West Side Design Option B). Construction disturbance would temporarily impact 0.031 acres (1,350 square feet) of arroyo willow riparian habitat. During construction of the Struve Slough Bridge, activities such staging, equipment access, construction of temporary access roads, construction of bridge abutments and construction of the bridge approaches may result in temporary disturbances to arroyo willow riparian, largely limited to pruning or limbing to allow for access. Some grubbing or grading may be required. If severely pruned or limbed, it is anticipated that arroyo willow riparian vegetation would resprout from the stumps and roots. If determined to be necessary, temporary disturbances to arroyo willow riparian would be mitigated onsite (or in close proximity) as necessary through in-kind replacement and/or enhancement.

CRLF Habitat. Upland habitats that may support CRLF refuge, movement, and dispersal include those sensitive habitats listed above as well as non-native grassland and fallow agricultural fields. Impacts to potential CRLF habitat and mitigation are described in **Impact BIO-1A** above.

Edge Habitats/Habitats of High Biological Diversity. Within the Study Area edge habitats occur on the CDFW Reserve between coastal scrub and non-native grassland habitats and along the edge of arroyo willow riparian habitat east of Struve Slough. Minimal to no direct impacts to edge habitats are anticipated as a result of the proposed Lee Road Trail Project. Temporary disturbance may result from trail construction in these areas. Equipment access, grubbing, vegetation removal, excavation, grading, and trail construction may result in temporary disturbance to edge habitats. Any vegetation removed would be replaced in-kind onsite. If permanent loss occurs, this impact would be mitigated through in-kind replacement or enhancement in close proximity to the area of disturbance.

Additionally, construction of the proposed trail would result in the permanent loss of approximately 1.66 acres of open space along the western edge of the CDFW Reserve, where the trail is proposed to be located. The open space that would be displaced consists of a narrow strip of land (approximately 20 feet in width) comprised of non-native grassland along Lee Road. Non-native grassland is not a sensitive habitat; however, this area serves as a buffer to the sensitive habitats located further east within the CDFW Reserve. As noted above, non-native grassland provides important edge habitat when located immediately adjacent to sensitive coastal scrub habitat. In addition, losing a portion of this buffer habitat reduces the overall open space of the Reserve. (This loss would be greatly reduced for Option B; however, Option B would result in loss of prime agricultural land.)

While the loss of open space would not be considered a significant impact under CEQA, CDFW has recommended analysis of impacts to buffers, and mitigation for those impacts as a condition of approval (i.e., granting an easement on the CDFW Reserve). Therefore, loss of the non-native grassland open space buffer along the edge of the Reserve is included in Mitigation Measure BIO-7, Conceptual Mitigation Plan (CMP). The CMP is required to mitigate other project impacts, and to minimize the degradation of sensitive habitats from project construction and operation.

Operation

The proposed Trail (and West Side Design Option B) would introduce increased pedestrian and bicycle use, as well as potential unauthorized access into the east side of the CDFW Reserve. Currently unpermitted access is mostly confined to the west side of the Reserve near the Highway 1 overpasses. New easier access to the east side of CDFW Reserve via the proposed Struve Slough Bridge is likely to increase unauthorized access to the Reserve and illegal encampments, particularly in the areas that provide shelter such as the coastal scrub and riparian habitats. The increased human presence through trail use and unauthorized access is likely to degrade sensitive habitats, including edge habitats through introduction of additional invasive weeds, trampling, compaction, significant alteration of the native vegetation, construction of shelters, increased trash, urine and fecal matter, and pollution of aquatic habitat.

Regular patrol by local law enforcement and regular maintenance visits by County of Santa Cruz and City of Watsonville Public Works Departments would deter and reduce unpermitted access and degradation of sensitive habitat. The fencing along the trail would include thorny native vegetation, such as California blackberry and wild rose, to deter trespassing into the Reserve. In addition, implementation of the following sensitive habitat protection measures will reduce potential impacts to less-than-significant:

- Equipment will be staged in ruderal and developed areas only and, within the CDFW Reserve, to the greatest feasible, equipment will access the trail alignment from the Lee Road side. Confine project activities and operation of equipment and vehicles, including site access and parking, to designated staging areas. The construction footprint, including removal or disturbance of existing vegetation will be minimized.
- Coastal scrub and other sensitive habitats will be fenced off to prevent encroachment. Reserve edge habitats wherever feasible.
- Where feasible, avoid grubbing and construction within 100 feet of the edge of sensitive habitats Restrict and minimize access roads into Struve Slough to the greatest extent feasible.

- Clean all equipment caked with mud, soils, or debris from offsite sources or previous project sites prior to staging equipment on site to avoid introducing or spreading invasive exotic plant species into the adjacent remaining habitats. All equipment used on the premises should be cleaned prior to leaving the site for future projects.
- The Project will result in no-net-loss of coastal scrub or arroyo willow riparian forest. Where temporary impacts to sensitive habitats occur, re-vegetate as needed with locally-sourced native plantings. Adjacent non-native grassland and ruderal habitats may also be planted with native vegetation, preserving edge effects, where appropriate.
- Upon project completion, areas remaining outside the project footprint will be planted with a planting palate of suitable native species. This will include using a native seed mix and container plants where appropriate. The native seed mix will be developed in coordination with Watsonville Wetlands Watch and CDFW to ensure proper species selection and application rates. Sterile barley or wheat may be used as erosion control in the first year following disturbance but the seed must have a minimum purity of 95 percent and 85 percent germination rate. A preliminary seed mix recommended for revegetation is included in **Appendix H**.
- In areas within, outside and adjacent to the project footprint, remove invasive species, particularly those designated by Cal-IPC as having moderate to high potential for "severe ecological impacts on physical processes, plant and animal communities, and vegetation structure."
- To compensate for the loss of the non-native grassland buffer, and to minimize degradation of sensitive habitats during trail operation, develop a CMP. The details of this program will be developed in consultation with CDFW, Watsonville Wetlands Watch and, if determined to be appropriate and beneficial, the Land Trust of Santa Cruz County. The program will include:
    - Strategies to protect sensitive habitat from degradation associated with trail operation and to enhance core areas to improve habitat values.
    - Monitoring of sensitive habitat (at a frequency to be determined in consultation with the agencies) to ensure degradation is not occurring.
    - In the event that the monitoring biologist identifies degradation of sensitive habitat, the program will include provisions for adaptive management to modify and/or supplement existing mitigation measures.
    - Monitoring and eradication of invasive weeds to prevent further encroachment into sensitive habitat areas.
    - Local law enforcement and public works representatives will immediately alert Watsonville Wetlands Watch, CDFW Reserve Representatives, and/or the assigned monitoring biologist in the event that illegal encampments or other degradation of sensitive habitats are observed.

  The program may include:
    - In conjunction with mitigation for displaced wetlands or CRLF habitat (described in Impact BIO 1-A above and BIO-3 below), creation or enhancement of sensitive habitats within the CDFW Reserve or on Watsonville Slough Farm.

5.3 *Wetlands/Other Waters*

3. ***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?***	☐	☒	☐	☐

Proposed trail construction would result in temporary and permanent impacts to wetlands, other waters, and associated habitats, including impacts to arroyo willow riparian (discussed above in the sensitive habitats section), palustrine emergent wetland, and aquatic (Struve Slough and Watsonville Slough). A jurisdictional aquatic resources delineation report was prepared for the Project Area (EcoSystems West 2020).

Work within wetlands and "other waters" is subject to regulation by the USACE under Section 404 of the CWA, by the Regional Board under Section 401 of the CWA and Porter Cologne Water Quality Act, and by CDFW under Section 1600. It is anticipated that the proposed project would require permits and approvals from these agencies.

Wetlands are also granted protections under the County's Sensitive Habitat Protection and Riparian Corridor and Wetlands Protection ordinances (SCCC 16.30 and 16.32). In order to conduct work within 100 feet of a wetland, the project must be granted a Riparian Exception. Based on the following criteria, the Project meets the preliminary requirements for approval of a Riparian Exception by the County:

- *There are special circumstances or conditions affecting the property.* The Lee Road Trail would provide scenic nature trail access for community members and for students between Pajaro Valley High School and the surrounding residential communities. The proposed trail provides the safest and most scenic access available. Although the proposed alignment will displace a small portion of a ruderal seasonal wetland as well as a seasonal seep, the trail is proposed to be located on the edge of the Reserve where impacts to biological resources, including wetlands, CRLF, and wildlife movement would be minimized. A replacement mitigation wetland would provide vastly improved wildlife habitat and wetland functions and values relative to the existing seasonal wetland, which is dominated entirely by facultative (FAC) invasive weeds. The seep wetland also provides only marginal functions and values in the landscape. The proposed trail does not displace valuable (prime) agricultural land.
- *The exception is necessary for the proper design and function of* the Lee Road Trail, a scenic nature trail, which is an allowed activity. Moving the trail further east into the Reserve would not eliminate impacts to the seasonal wetland and may result in increased permanent impacts to sensitive resources and habitat fragmentation. West Side Design Option B would result in the permanent displacement of prime agricultural land and present possible conflicts with farming activities and increase public exposure to irrigation (spraying), and fugitive dust. Moreover, this option would require an additional crossing on Lee Road which increases potential safety hazards from vehicles accessing the Fitz Fresh Mushroom Facility and the Land Trust's Watsonville Slough Farms Property.
- *The granting of the riparian exception will not be detrimental to the public welfare or injurious to other property downstream or in the area in which the project is located.* The Lee Road Trail would be an asset to public welfare in that it is providing safe access for residents and for Pajaro Valley High School students along a scenic nature trail. The proposed trail location is positioned as far from the sloughs (and its resources) as possible and the general topography near the trail slopes away from the Struve Slough. The bridge is proposed to be constructed on top of the existing submerged Lee Road,

once approximately 50 percent of the asphalt has been removed. At least part of the existing submerged road will be removed for the project which is expected to improve habitat quality and remove non-native asphalt and other materials from the slough. The granting of the riparian exception in the Coastal Zone will not reduce or adversely impact the riparian corridor; minimal permanent impacts (0.017 acres) to the riparian corridor are anticipated as a result of the proposed Project; and there is no feasible less environmentally damaging alternative to crossing the slough. The proposed trail would be positioned along the outside westernmost edge of the CDFW Reserve and with the bridge supports positioned on top of the existing submerged road, where approximately 50 percent of the asphalt has been removed, thereby minimizing impacts to riparian vegetation and Struve Slough. Design Option B would avoid the weedy seasonal wetland that would be displaced by the proposed trail; however, it would temporarily impact 0.423 acres and permanently displace 0.311 acres of prime agricultural land.

The replacement/mitigation wetland(s) would provide improved wildlife habitat and wetland functions and values and would offset these losses. In general, the CMP that will describe mitigation for the proposed trail would enhance habitat conditions within the Reserve while West Side Option B would not have result in this benefit. Further, Option B would be less scenic, would displace valuable agricultural lands, and is less safe for trail users.

- *The granting of the exception, in the Coastal Zone, will not reduce or adversely impact the riparian corridor, and there is no feasible less environmentally damaging alternative.* A total of 0.017 acres of permanent impacts to the riparian corridor (arroyo willow riparian) are anticipated as a result of the proposed Project. This impact is required to facilitate the landing of the pedestrian bridge south of Struve Slough. This impact is unavoidable and there is no feasible less environmentally damaging alternative design for the bridge. The remainder of proposed trail would be positioned along the outside edge of the CDFW Reserve with the minimum number of necessary bridge supports within the Struve Slough, thereby avoiding impacts to riparian vegetation and minimizing impacts to West Branch Struve Slough and Struve Slough.
- *The granting of the riparian exception is in accordance with the purpose of [Chapter 16.30 Riparian Corridor and Wetlands Protection][17], the objectives of the General Plan and elements thereof, and the Local Coastal Program Land Use Plan.* Through the proposed placement and careful design of the trail, impacts to the riparian corridor would be minimized and the trail is in accordance with protections, values, and goals of the ordinance. The trail satisfies the directives of the County of Santa Cruz General Plan and the LCP by providing direct scenic access to the CDFW Reserve and educational opportunities for the community. It is also consistent with the City of Watsonville's Trail and Bicycle Master Plan for the Watsonville Scenic Trails Networks (November 2012).

[17] The purpose of this chapter is to minimize and to eliminate any development activities in the riparian corridor, preserve, protect, and restore riparian corridors for: protection of wildlife habitat; protection of water quality; protection of aquatic habitat; protection of open space, cultural, historical, archaeological and paleontological, and aesthetic values; transportation and storage of floodwaters; prevention of erosion; and to implement the policies of the General Plan and the Local Coastal Program Land Use Plan. [Ord. 3335 § 1, 1982; Ord. 2460, 1977].

IMPACT BIO-3: The project would adversely affect wetlands, aquatic habitat and associated riparian habitat.

Seasonal Wetland. One small (0.07 acres), ruderal palustrine emergent wetland, located near the gated entrance to the CDFW Reserve near the Harkins Slough Road/Lee Road intersection, would be impacted by the proposed trail. This marginal wetland is dominated entirely by facultative (FAC) annual invasive weeds, and hydrologic indicators limited largely to surface soil cracks demonstrate this wetland is saturated for very short durations during the rainy season. Moreover, the landscape position and microtopography of the wetland does not provide significant benefits (i.e. ecosystem services) to the larger Watsonville Sloughs system in terms of water quality, sediment sequestration, and nutrient cycling. The homogeneous vegetation and lack of open water provide limited habitat to value to wildlife within the Reserve.

The project would result in 0.005 acres (220 square feet) of permanent impacts to this feature and 0.009 acres (440 square feet) of temporary impacts. The seasonal wetland would be partially displaced by construction of the proposed trail, through equipment access, grubbing, vegetation removal, grading, and trail construction. Impacts to this feature would be minimized to the extent feasible and permanent loss would be mitigated through replacement and/or enhancement. Mitigation opportunities identified by Watsonville Wetlands Watch indicate creation of new wetland features elsewhere within the CDFW Reserve or nearby Watsonville Sloughs system would result in net ecological benefits for water quality, habitat connectivity, nutrient cycling, sediment sequestration, and wildlife habitat (**Appendix H**). West Side Design Option B would avoid the weedy seasonal wetland.

Seep. One small 0.010-acre wetland seep is situated along the steep, eastern embankment of Lee Road immediately north of the area where the road becomes submerged beneath Struve Slough. This feature is dominated entirely by facultative (FAC) plants and the landscape position and direct indicators of wetland hydrology indicate the seep wetland is only saturated near the ground surface for short durations during the rainy season. The seep appears to be the result of flowing surface and subsurface water abruptly intercepting the steep, unnatural escarpment/road cut along the east side of the Lee Road. This feature does not contain standing water or vegetative structural heterogeneity and therefore provides limited benefit to wildlife.

The project, as currently designed, would result is likely to displace or result in permanent impacts to the entire 0.010 acres (440 square feet) of this feature for construction of the proposed bridge landing extending over Struve Slough. To safely position the northernmost bridge support, this impact is unavoidable. In addition, the seep wetland may be impacted by construction of a stormwater management "bioswale" upslope and east of the seep. Capture of surface water flows by the swale are necessary for safety and function of the trail and may directly impact the hydrology of the seep. It is possible that this feature will no longer maintain wetland hydrology due to this modification. As currently designed the bioswale would terminate in a vegetated basin (seasonal wetland) and rock-lined outfall structure that would offset the loss of this feature in part. Onsite mitigation opportunities would be included in the functional design of the proposed bioswale, or will be included in the design and planned functions and values of the proposed mitigation wetlands as outlined in **Appendix H.**

Freshwater Marsh. Freshwater marsh occurs at the margins of Struve Slough and along the channelized stretch of Watsonville Slough. The project would result in 0.017 acres (740 square feet) of permanent impacts and 0.121 acres (5,300 square feet) of temporary impacts to this habitat types. Permanent impacts and temporary disturbance to this habitat type would occur during construction of the Struve

Slough Bridge and during replacement of the Watsonville Slough culvert under Lee Road. For Struve Slough bridge construction, activities such staging, equipment access, construction of temporary access roads, construction of bridge abutments and construction of the bridge approaches may result in temporary disturbances to freshwater marsh. For the culvert replacement, some marsh vegetation would be displaced to allow for installation of the longer culvert. During construction some additional vegetation may need to be removed in order to access the construction footprint. Vegetation that is temporarily impacted during construction would be replaced through natural recruitment or, where necessary, replacement planting. Permanent displacement would be mitigated through replacement or enhancement, to be described in further detail in the CMP.

Aquatic Habitat. Permanent impacts to of 0.003 acres (130 square feet) to the aquatic habitat of Struve Slough would result from displacement of this habitat by the piers to support Struve Slough Bridge. Temporary impacts of 0.497 acres (22,000 square feet) would result from construction, including equipment access, construction of temporary access roads, installation of coffer damns, construction of bridge piers and construction of the bridge. Impacts may occur from the introduction of sediment or construction materials, potential unanticipated releases of equipment fuel, hydraulic fluid, or other potentially hazardous substances used in construction equipment. No permanent impacts to Watsonville Slough are anticipated as a result of the culvert replacement. Temporary impacts may result from construction including introduction of sediments or other construction-related materials. Best Management Practices would be employed to minimize water quality impacts, as described in the BMP Section below.

Implementation of the measures listed below would mitigate these impacts to less-than-significant.

- Avoid or minimize disturbance to palustrine emergent wetlands (seasonal wetland, seep, and freshwater marsh), and aquatic habitats by having a qualified biologist identify fencing for the work limits, staging, and access areas; and restrict all activity to within this footprint.
- Where feasible, avoid grubbing and construction within 100 feet of the edge of wetlands and other waters per the County of Santa Cruz General Plan/LCP and Sensitive Habitats Ordinance. Restrict access roads into Struve Slough and minimize access roads to the greatest extent feasible.
- Replace and/or enhance displaced features (seasonal wetland and freshwater marsh) at a ratio to be determined in consultation with regulatory agencies. Typical mitigation ratios vary between 2:1 and 4:1 depending on the quality of the displaced habitat. The size and location of replacement wetlands would be developed in the CMP (see below). Onsite mitigation (i.e. within the CDFW Reserve and along channelized Watsonville Slough) would be the preferred location/s for the mitigation wetland(s); the LTSCC has also proposed Watsonville Slough Farm (located adjacent to the CDFW Reserve across Lee Road to the west) as an alternate mitigation wetland site. A memo developed by Watsonville Wetlands Watch identifying potential mitigation sites is included in **Appendix H**. This memo outlines several viable areas for wetland creation and enhancement, including within the CDFW Reserve. Site reconnaissance and advanced planning for these locations indicate that these are areas would meet the objectives for long-term benefits to wetland resources and wildlife within the Watsonville Sloughs system.
- Develop and implement a Conceptual Mitigation Plan (CMP) that will include the following:
    - Plan mitigation strategies with regulatory agencies including the City of Watsonville, Watsonville Wetlands Watch, County of Santa Cruz, CDFW, the Regional Board, and USFWS.

- Description of the Project including acreage of temporary and permanent impacts to palustrine emergent wetland, arroyo willow riparian and freshwater marsh, and aquatic habitat (Struve Slough, as identified in the formal delineation of jurisdictional wetlands and other Waters of the U.S.;
- Description of the Project including acreage of temporary and permanent impacts to other sensitive habitats, including coastal scrub, edge habitats and areas of high biological diversity, and CRLF habitat;
- Goals of compensatory mitigation project including types and areas of wetland and aquatic habitat to be created, restored, and/or enhanced, and mitigation ratios (created/restored/enhanced : impacted);
- Location and acreage of wetland and riparian mitigation areas including size and ownership status (**Appendix H**);
- Detailed construction and planting techniques;
- Replacement of all non-native tree and shrub vegetation with native, locally-sourced vegetation. The non-native tree to be removed for trail construction (at southern Struve Slough Bridge approach) will be replaced with native trees. Any permanent disturbance to coastal scrub or riparian habitat will be mitigated through in kind replacement and/or enhancement.
- Description and design of habitat requirements for special-status wildlife, including CRLF, occupying wetland and aquatic habitats;
- Maintenance activities during the monitoring period, including replanting native wetland and riparian vegetation and weed removal, that will not result in take of CRLF;
- Strategies for protecting the habitat values of the CDFW Reserve, Struve Slough, and Watsonville Slough, including wildlife movement;
- Long-term quantitative and qualitative monitoring and reporting, documenting ability to meet or surpass performance criteria; and
- Adaptive management strategies to ensure long-term viability of mitigation areas.

The Lee Road North - West Side Design Option B would avoid the weedy seasonal wetland, located in the northern portion of the CDFW Reserve; therefore, mitigation for this feature would not be required.

5.4 *Wildlife Movement*

4. ***Interfere substantially with the movement of any native resident or migratory fish or wildlife species or migratory wildlife corridors, or impede the use of native wildlife nursery sites?***	☐	☐	☒	☐

Wildlife that are moving through the Study Area and surroundings are likely to use the sloughs and adjacent riparian habitat as linear corridors because of the shelter, cover, food and water resources these areas provide; however, some species are likely to cross the section of Lee Road northwest of Struve Slough, to move between the CDFW Reserve, Chivos Pond and Hanson's Slough (on Watsonville Slough Farm property). Lee Road would be considered an existing barrier to wildlife movement; however, this section of Lee Road dead ends at Struve Slough and traffic is currently primarily limited to vehicles accessing Watsonville Slough Farm and Fitz Fresh Mushrooms Farm, and mostly during daytime hours. Therefore Lee Road is somewhat permeable to wildlife movement as are the surrounding agricultural fields. Potential impacts to wildlife movement associated with the proposed Lee Road Trail Project are described below.

IMPACT BIO-4: The project could interfere with wildlife movement, temporarily during construction, and permanently during operation of the trail.

Construction

In the Lee Road North section of the trail (by the CDFW Reserve), construction of the proposed trail may deter wildlife from moving through the Project Area; however, wildlife movement across Lee Road is more likely to occur during nighttime hours. Construction-related deterrents to movement would be temporary, would occur during the dry season, when CRLF movement would be minimal, and would occur only during daylight hours, minimizing this potential impact.

Work occurring directly in Struve Slough and Watsonville Slough is likely to disrupt wildlife movement in the sloughs through increased noise levels, vibrational, and visual disturbances, and barriers to movement. Construction activities within the sloughs would occur during the dry season, when the water level is lowest. Dewatering of Struve Slough for up to 3 to 4 months is anticipated to be necessary in order to install the bridge piers. Clean gravel with passive gravity culverts would be placed on top of the existing roadway within the Slough. Wildlife passage may be possible through the culverts, but aquatic movement through Struve Slough is expected to be disrupted. Some species would be able to cross the gravel bar for passage, but may be more vulnerable to predation (the gravel bar would be connected to terrestrial areas on each side of the slough and would lack protective cover).

Operation

Operation of the trail, including increases in vehicle traffic, pedestrian and bicycle use, and maintenance of the trail through weeding, mowing, pruning, and trail repair may also deter wildlife movement. Once the Lee Road Trail is fully built out (i.e., all five sections are constructed and open for use)and connected to the larger planned trail systems (LTSCC Watsonville Slough Farm, City Trail & Bicycle Master Plan, and Monterey Bay Sanctuary Scenic Trail system), it is estimated there could be up to 225 daily users throughout the week. Initially, the number of daily users is anticipated to be much lower, and additional vehicle traffic would be minimal. Off-street parking will be provided for vehicles accessing the Watsonville Slough Farm trails from Lee Road. The Lee Road Trail would be only open during daylight hours, from dawn to dusk. Wildlife-friendly fencing would be installed along the east side of the trail along the CDFW Preserve that would allow wildlife to move across the trail. California blackberry, wild rose (*Rosa californica*), and other native plants that provide cover and shelter for wildlife and deter trespassing would be planted along the fence line. These factors minimize this potential impact to less than significant. Further, mitigation measures for CRLF (Impact BIO-1A above) and sensitive habitats (Impact BIO-2), to prevent degradation of existing habitat and allow parking along Lee Road during daytime hours only, would further reduce this impact to less than significant.

We recommend implementation of the measures listed below to reduce this impact to less-than significant.

- During construction, install fencing along the alignment with openings every 50 feet that would allow passage of wildlife.
- With agency approval, a biological monitor would be present during work within the sloughs to relocate wildlife species, if necessary. See also mitigation under BIO-1A above.

5.5 *Local Policies and Ordinances*

5. ***Conflict with any local policies or ordinances protecting biological resources (such as the Sensitive Habitat Ordinance, Riparian and Wetland Protection Ordinance, and the Significant Tree Protection Ordinance)?***	☐	☒	☐	☐

The County of Santa Cruz Sensitive Habitat Ordinance requires that any unavoidable environmental impacts to sensitive habitats be mitigated. In addition, the ordinance calls for the protection of sensitive habitats "undisturbed by the proposed development activity" or on an adjacent parcel through measures such as conservation easements. Additionally, restoration "commensurate with the scale of the proposed development" is required for degradation of sensitive habitats caused by the project. Impacts to and proposed mitigation for sensitive habitats, including wetlands and aquatic habitat are described under #2 and #3 above, respectively.

The project would require a Riparian Exception in order to be consistent with the County of Santa Cruz Riparian Corridor and Wetlands Protection Ordinance, as described under #3 above. Preliminary analysis has determined that the project complies with these findings. The project is therefore consistent with the County of Santa Cruz Riparian Corridor and Wetlands Protection Ordinance, and impacts from project implementation would be less than significant with mitigation incorporated.

One significant tree is proposed to be removed for the Lee Road Trail Project. A large (72-inch dbh) eucalyptus tree is proposed for removal to allow installation of the proposed southern Struve Slough Bridge approach. This tree is located within the jurisdiction of the County of Santa Cruz and Coastal Zone and would therefore be subject to the Significant Tree Protection Ordinance. Preliminary analysis has determined that removal of this tree would comply with the Significant Tree Protection Ordinance through issuance of a Coastal Development Permit (CDP) and through the following sections excerpted from SCCC 16.34:

> *(B) Removal is necessary to protect health, safety, and welfare.* In order to provide a safe feasible approach for the Struve Slough Bridge this tree would need to be removed. Construction of the bridge approach would require removal as would safe operation of the trail.
>
> *(C) Removal of a nonnative tree is part of a plan approved by the County to restore native vegetation and landscaping to an area.* The non-native eucalyptus tree would be replaced with native vegetation suitable to the location adjacent to the slough, as described in the mitigation below.
>
> *(D) Removal will not involve a risk of adverse environmental impacts such as degrading scenic resources.* The removal of the eucalyptus tree would not result in adverse environmental effects. The non-native tree would be replaced with native vegetation more suitable to, and scenic in, the natural landscape, as described in the mitigation below.
>
> *(F) Removal is necessary in conjunction with another permit to allow the property owner an economic use of the property consistent with the land use designation of the Local Coastal Program Land Use Plan.* This project would create a scenic nature study trail and is therefore consistent with the County Local Coastal Program and land use designations in its mandate to allow for public access to coastal resources.

IMPACT BIO-5: One significant tree would be removed to allow for construction (and operation) of the southern Struve Slough Bridge approach.

Implementation of the measures listed below would mitigate this impact to less-than-significant.

- The southern Struve Slough Bridge approach would be revegetated with native vegetation suitable to the location such as: blue elderberry (*Sambucus nigrum*), coffeeberry (*Frangula californica*), Indianhemp dogbane (*Apocynum cannabinum*), California blackberry (*Rubus ursinus)*, and wild rose (*Rosa californica)*. Although these species are not tree species, this palette is more suitable than trees to the natural landscape in this location.
- To fulfill the condition of approval to replace Significant Trees within the County Coastal Zone, and to mitigate for impacts elsewhere along the trail, native tree(s) would be planted as a component of the CMP (#2 above). The mitigation location for tree replacement and selection of tree species would be determined by a qualified biologist in conjunction with the County, CDFW, and Watsonville Wetlands Watch. Native tree/s suitable to the proposed mitigation location for mitigation and the planting plan would be approved at replacement ratio determined by the County prior to implementation.

5.6 *Habitat Conservation Plans*

6. ***Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?***	☐	☐	☐	☒

The proposed project does not conflict with other approved local, regional, or state habitat conservation plans.

5.7 *Recommended Best Management Practices Natural Resource Protection*

Below we have listed additional best management practices (BMPs) to further reduce potential impacts to biological resources:

- Follow all conservation regulations, policies, and principles in Chapter 5- Conservation and Open Space of the General Plan and LCP (1994). For wildlife habitats and sensitive communities, including wetlands, follow applicable regulations from Sections 16.30 and 16.32 of the Environmental and Resource Protection section of County of Santa Cruz Municipal Code.
- Refueling and/or maintenance of vehicles and equipment will be performed in designated staging areas. Workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur. Follow all state and federal laws pertaining to hazardous material handling and management.
- Position all stationary equipment such as motors, pumps, generators, and/or compressors over drip pans. Store vehicles and equipment in designated staging area. Position parked equipment over drip pans or absorbent material.
- To the greatest extent possible, stabilize all exposed or disturbed areas within the construction area. Install erosion control measures such as silt fences, weed-free straw bales, plywood, straw wattles, water check bars, and broadcast weed-free straw wherever silt laden water has the potential to leave

the work site and enter the nearby drainages. Modify, repair, and/or replace erosion control measures as needed.

- Prohibit smoking or allow workers to smoke in designated areas clear of dry vegetation and away from hazardous materials. Dispose of cigarette butts in an appropriate area away from the project site.
- During construction, all food trash that may attract predators into the work area should be properly contained and removed from the work site on a daily basis. Construction debris and trash should also be properly contained and removed from the work site on a regular basis.

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APPENDIX A. SPECIAL-STATUS PLANTS WITH POTENTIAL TO OCCUR

Appendix A. Status, distribution and habitat of special-status plants with potential to occur in the vicinity of the proposed Lee Road Trail Project, Watsonville, Santa Cruz County, California.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Amsinckia lunaris bent-flowered fiddleneck	None	None	List 1B.2	Cismontane woodland, valley and foothill grassland, coastal bluff scrub	ALA, CCA, COL, LAK, MRN, NAP, SBT, SCL, SCR, SHA?, SIS?, SMT, SON, YOL	March-June	**LOW.** Some potential for occurrence in non-native grassland and coyote brush scrub in the CDFW Watsonville Slough Ecological Reserve (Reserve) portion of the Study Area. However, not observed during June 2019 or May 2020 focused rare plant survey.
Arctostaphylos andersonii Santa Cruz manzanita	None	None	List 1B.2	Chaparral; openings in and edges of broadleaved upland forest and north coast coniferous forest	SCL, SCR, SMT	November-April	**NONE.** Suitable habitat not present within the Study Area. No manzanita species were observed during the June 2019 and May 2020 focused rare plant survey.
Arctostaphylos hookeri ssp. *hookeri* Hooker's manzanita	None	None	List 1B.2	Closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub	MNT, SCR	January-June	**NONE.** Suitable habitat not present within the Study Area. No manzanita species were observed during the June 2019 and May 2020 focused rare plant survey.
Arctostaphylos pajaroensis Pajaro manzanita	None	None	List 1B.1	chaparral; sandy soil	MNT, SBT, SCR*	December-March	**NONE.** Suitable habitat not present within the Study Area. No manzanita species were observed during the June 2019 and May 2020 focused rare plant survey.
Arctostaphylos regismontana Kings Mountain manzanita	None	None	List 1B.2	Broadleaved upland forest, chaparral, North Coast coniferous forest; granitic or sandstone	SCL, SCR?, SMT	January-April	**NONE.** Suitable habitat not present within the Study Area. No manzanita species were observed during the June 2019 and May 2020 focused rare plant survey.
Arctostaphylos silvicola Bonny Doon manzanita	None	None	List 1B.2	Inland marine sands in chaparral, closed-cone coniferous forest, sand parkland, sandhill ponderosa pine forest	SCR	February-March	**NONE.** Suitable habitat not present within the Study Area. No manzanita species were observed during the June 2019 and May 2020 focused rare plant survey.
Calandrinia breweri Brewer's calandrinia	None	None	List 4.2	Chaparral, coastal scrub; sandy or loamy, disturbed sites and burns	CCA, LAX, MEN, MNT, MPA, MRN, NAP, SBA, SBD, SCL, SCR, SCZ, SDG, SLO, SMT, SON, VEN, BA	March-June	**LOW.** The Study Area primarily supports clayey soils not suitable for this species despite presence of coastal scrub habitat. No known occurrences from Watsonville or southern Santa Cruz County. This species was not observed during June 2019 or May 2020 focused rare plant surveys.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Calyptridium parryi var. *hesseae* Santa Cruz Mtns. pussypaws	None	None	List 1B.1	Chaparral, cismontane woodland; sandy or gravelly openings	MNT, SBT, SCL, SCR*	May-July	**NONE.** Suitable habitat and sandy or gravelly soil types not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Carex comosa bristly sedge	None	None	List 2.1	Marshes and swamps, lake margins, coastal prairie, valley and foothill grassland	CCA, LAK, MEN, SAC, SBD*, SCR*, SFO*, SHA, SJQ, SON, Idaho, Oregon, Washington, other states	May-September	**LOW**. Seasonal seep wetland supports *Carex barbarae and Carex obnupta* was observed along the perimeter of Struve Slough; however, *Carex comosa* is presumed extirpated from Santa Cruz County. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Carex saliniformis deceiving sedge	None	None	List 1B.2	Coastal prairie, coastal scrub, meadows, coastal salt marshes	HUM, MEN, SCR*, SON	May-July	**NONE.** Perennial saline wetland habitat not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Castilleja latifolia Monterey paintbrush	None	None	List 4.3	Closed cone coniferous forest, cismontane woodland (openings), coastal dunes, coastal scrub; sandy soils	MNT, SCR	February-September	**NONE.** Suitable habitat with sandy soils not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Ceanothus ferrisiae Coyote ceanothus	Endangered	None	List 1B.1	Chaparral, coastal scrub, valley and foothill grassland; serpentinite	SCL	January-March	**NONE.** Serpentinite soils not present within Study Area. Not known from Santa Cruz County. Species is identifiable outside of the flowering period and was not observed during June 2019 or May 2020 focused rare plant surveys.
Centromadia parryi ssp. *congdonii* Congdon's tarplant	None	None	List 1B.2	Valley and foothill grassland; alkaline soils	ALA, CCA, MNT, SCL(*?), SCR*, SLO, SOL*	May-November	**LOW.** Alkaline soils not observed within the Study Area. There is a mapped occurrence of Congdon's tarplant adjacent to Harkins Slough approximately 1 mile northwest of the Study Area. However, this species was not observed during June 2019 or May 2020 focused rare plant surveys.
Chorizanthe pungens var. *hartwegiana* Ben Lomond spineflower	Endangered	None	List 1B.1	Inland marine sands in chaparral, closed-cone coniferous forest, sand parkland, sandhill ponderosa pine forest	SCR	April-July	**NONE.** Suitable inland sandhill and sand parkland habitat not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Chorizanthe pungens var. *pungens* Monterey spineflower	Threatened	None	List 1B.2	Maritime chaparral, cismontane woodland coastal dunes, coastal scrub, valley and foothill grassland; sandy soils	MNT, SCR	April-June	**NONE.** Sandy, well drained soils known to support this species are not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Chorizanthe robusta var. *hartwegii* Scotts Valley spineflower	Endangered	None	List 1B.1	Meadows, grasslands in sandstone or mudstone	SCR	April-July	**NONE.** Suitable sandstone or mudstone habitat not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Chorizanthe robusta var. *robusta* robust spineflower	Endangered	None	List 1B.1	Coastal dunes, coastal scrub, openings in cismontane woodland, in sandy or gravelly soil	ALA*, MNT, MRN, SCL*, SCR, SFO, SMT*	April-September	**NONE.** Suitable sandy or gravelly soils are not present within the Study Area. However, this species is known from an occurrence in grassland near Harkins Slough approximately one mile west of the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys. This species was not observed during May 2018 focused rare plant surveys.
Clarkia concina ssp. *automixa* Santa Clara red ribbons	None	None	List 4.3	Cismontane woodland	ALA, SCL	April-July	**NONE.** Suitable cismontane woodland habitat not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Cordylanthus rigidus ssp. *litoralis* seaside bird's beak	None	Endangered	List 1B.1	Closed cone coniferous forest, maritime chaparral, cismontane woodland, coastal dunes, coastal scrub; sandy often disturbed sites	MNT, SBA	May-September	**NONE.** Suitable sandy soils not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Cyperidium fasciculatum clustered lady's slippers	None	None	List 4.2	Lower montane coniferous forest, North Coast coniferous forest; usually serpentinite seeps and streambanks	BUT, DNT, HUM, NEV, PLU, SCL, SCR*, SHA, SIE, SIS, SMT, TEH, TRI, YUB, ID, OR, UT, WA+	March-July	**NONE.** Suitable coniferous forest and serpentine streambank habitat not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Cyperidium montanum mountain lady's slipper	None	None	List 4.2	Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, North Coast coniferous forest	DNT, HUM, MAD, MEN, MOD, MPA, PLU, SIE, SIS, SMT, SON, TEH, TRI, TUO, OR, WA++	March-July	**NONE.** Suitable forested habitat not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Dudleya abramsii ssp. *setchellii* Santa Clara Valley dudleya	Endangered	None	List 1B.1	Cismontane woodland, valley and foothill grassland; serpentinite, rocky	SCL	April-October	**NONE.** Suitable serpentine outcrops not present within the Study Area. Not known from Santa Cruz County.
Elymus californicus California bottle-brush grass	None	None	List 4.3	Broadleaved upland forest, cismontane woodland, North Coast coniferous forest, riparian woodland	MNT, MRN, SCR, SMT, SON	July-September	**NONE.** Suitable habitat is not present within the Study Area. This species is not known to occur in arroyo willow riparian forest. This species was not observed in a vegetative state or during subsequent site visits during the blooming period.
Ericameria fasciculata Eastwood's goldenbush	None	None	List 1B.1	Closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub; sandy openings	MNT	July-October	**NONE.** Suitable habitat, including sandy openings not present within the Study Area. Although surveys were conducted outside of the flowering period, this species would have been identifiable by vegetative characteristics.
Eriogonum nudum var. *decurrens* Ben Lomond buckwheat	None	None	List 1B.1	Inland marine sands in chaparral, closed-cone coniferous forest, sand parkland, sandhill ponderosa pine forest	ALA, SCL, SCR	June-October	**NONE.** Suitable sandy soils and sand parkland habitat, is not present within the Study Area. No potential for occurrence within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Eryngium aristulatum var.hooveri button celery	None	None	List 1B.1	Vernal pools	ALA, SBT, SCL (*?), SDG, SLO	June-August	**NONE.** Suitable vernal pool habitat is not present within the Study Area. No potential for occurrence within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Erysimum ammophilum sand-loving wallflower	None	None	List 1B.2	Chaparral, coastal dunes, coastal scrub; sandy openings	SCR	March-July	**NONE.** Suitable sandy soil and dune habitat not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Erysimum teretifolium Santa Cruz wallflower	Endangered	Endangered	List 1B.1	Inland marine sands in chaparral, closed-cone coniferous forest, sand parkland, sandhill ponderosa pine forest	SCR	March-July	**NONE.** Suitable sandy soils and sand parkland habitat, is not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Fritillaria liliaceae fragrant fritillary	None	None	List 1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland; usually serpentinite	ALA, CCA, MNT, MRN, SBT, SCL, SFO, SMT, SOL, SON	February-April (May)	**NONE.** Serpentine soils not present within the Study Area. Not known from Santa Cruz County. This species was not observed during May 2020 focused rare plant surveys. Subsequent surveys not required.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Gilia tenuiflora ssp. *arenaria* sand gilia	Endangered	Threatened	List 1B.2	Chaparral, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland; sandy openings	MNT	April-June	**NONE.** Suitable sandy openings not present within the Study Area. Not known from Santa Cruz County. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Grindelia hirsutula var. *maritima* San Francisco gumplant	None	None	List 1B.2	Coastal bluff scrub, coastal scrub, valley and foothill grassland; sandy or serpentinite soils	MNT, MRN, SCR, SFO, SLO, SMT	June-September	**NONE.** Not known from Santa Cruz County; sandy and serpentine soils not present within the Study Area. No Potential for occurrence within the Study area. Not observed during June 2019 focused rare plant surveys or July/August 2019 wetland delineation site visits. Subsequent surveys not required.
Hoita strobilina Loma Prieta hoita	None	None	List 1B.1	Moist sites in chaparral, cismontane woodland, riparian woodland, often serpentinite	ALA*, CCA*, SCL, SCR	May-July (August-October)	**NONE.** Suitable serpentine soils and riparian woodland habitat not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Holocarpha macradenia Santa Cruz tarplant	Threatened	Endangered	List 1B.1	Coastal prairie, valley and foothill grassland, coastal scrub, often in clay or sandy soils	ALA*, CCA*, MNT, MRN*, SCR, SON*	May-October	**LOW/MODERATE.** Found in disturbed annual grassland with loamy clay soils and coastal prairie habitat less than one half mile west of the Study Area. However, this species has never been observed from the Study Area despite numerous focused surveys and typically requires continuous ongoing disturbance (e.g. grazing, mowing) for viability. A nearby 1990s era transplantation/restoration site within the CDFW Reserve was unsuccessful. This species not observed during focused June 2019 and May 2020 rare plant surveys or subsequent site visits later in the flowering period.
Horkelia cuneata ssp. *sericea* Kellogg's horkelia	None	None	List 1B.1	Openings in closed-cone coniferous forest, maritime chaparral, coastal scrub, coastal prairie, in sandy or gravelly soil	ALA*, MRN*, MNT, SBA, SCR, SFO*, SLO, SMT	April-September	**NONE.** Suitable sandy and gravelly soils not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Hosackia gracilis harlequin lotus	None	None	List 4.2	Moist to wet places, broadleaved upland forest, coastal scrub, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, meadows and seeps, marshes, north coast coniferous forest, valley and foothill grassland	DNT, HUM, MEN, MNT, MRN, SBT, SCR, SFO, SLO, SMT, SON, Oregon, Washington	March-July	**LOW.** Potential for occurrence along margins of freshwater seep wetland and seasonal wetland habitat within the Study Area. Nearest known extant occurrences are more than 10 miles northwest of the Study Area along the north coast. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Iris longipetala coast iris	None	None	List 4.2	Coastal prairie, lower montane coniferous forest, meadows and seeps	ALA, CCA, HUM, MEN, MNT, MRN, NAP, SBT, SCL, S FOSMT, SOL, SO N	March-May	**LOW.** Potential for occurrence in remnant coastal prairie and along margins of Struve Slough within the Study Area. Only one known occurrence in Santa Cruz County at the Glenwood Preserve in Scotts Valley. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Lasthenia californica ssp. *macrantha* perennial goldfields	None	None	List 1B.2	Coastal bluff scrub, coastal dunes, coastal scrub	DNT, HUM, MEN, MRN, SCR, SLO, SMT, SON	January-November	**NONE.** Primarily occurs in coastal bluff scrub which is not present in the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Lessingia micradenia var. *glabrata* smooth lessingia	None	None	List 1B.2	Chaparral, cismontane woodland, valley and foothill grassland, roadsides, usually in serpentine soils	SCL	July-November	**NONE.** Not known from Santa Cruz County. Serpentine soils not present within the Study Area. No potential for occurrence in the Study Area. Subsequent surveys are not required.
Lomatium parvifolium small-leaved lomatium	None	None	List 4.2	Closed cone coniferous forest, chaparral, coastal scrub, riparian woodland; serpentinite soils	MNT, SCR, SLO	February-June	**NONE.** Serpentine soils not present within the Study Area. No potential for occurrence in the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Malacothamnus arcuatus arcuate bush mallow	None	None	List 1B.2	Chaparral, cismontane woodland	SCL, SCR, SMT	April-September	**NONE.** Suitable habitat not present within the Study Area. No potential for occurrence in the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Malacothamus hallii Hall's bush mallow	None	None	List 1B.	Chaparral, coastal scrub	CCA, MEN, MER, SCL, SMT, STA	May-September	**NONE.** Suitable chaparral and high-quality, xeric coastal scrub habitat not present within the Study Area. This species is not known from Santa Cruz County and was not observed during June 2019 or May 2020 focused rare plant surveys.
Micropus amphibolus Mt. Diablo cottonweed	None	None	List 3.2	Rocky areas in broadleaved upland forest, chaparral, cismontane woodland, valley and foothill grassland, coastal scrub	ALA, CCA, COL, LAK, MNT, MRN, NAP, SBA, SCL, SCR, SJQ, SLO, SOL, SON	March-May	**NONE.** Shallow, rocky soils not-present in low quality annual grassland and coastal prairie habitat within the Study Area. Several extant occurrences documented throughout northern and western Santa Cruz County. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Monardella sinuata ssp. nigrescens northern curly leaved monardella	None	None	List 4.2	Closed cone coniferous forest, chaparral, coastal dunes, coastal prairie, coastal scrub, lower montane coniferous forest (pine sandhills); sandy areas	MNT, MRN, SBA, SCR, SFO, SLO, SMT, SON	May-July	**NONE.** Northern curly leaved monardella is limited entirely to sandy soils which are not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Monolopia gracilens woodland woolythreads	None	None	List 1B.2	Chaparral, valley and foothill grassland, cismontane woodland, broadleaved upland forest, north coast coniferous forest; in openings on sandy to rocky soils, often serpentinite after burns	ALA, CCA, MNT, SBT, SCL, SCR, SLO, SMT	February-July	**NONE.** Sandy and/or rocky serpentine soils not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Pedicularis dudleyi Dudley's lousewort	None	Rare	List 1B.2	Maritime chaparral, north coast coniferous forest, cismontane woodland, valley and foothill grassland	MNT, SCR*, SLO, SMT	April-June	**NONE.** Last known record for Santa Cruz County dates to 1884 collection. Extant occurrences in adjacent counties occur primarily in mixed evergreen forest habitat which is not present in within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Penstemon rattanii var. *kleei* Santa Cruz Mtns. Beardtongue	None	None	List 1B.2	Chaparral, lower montane coniferous forest, North Coast coniferous forest, often in sandy soil	SCL, SCR	May-June	**NONE.** Suitable sandy soil and forested habitats are not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Pentachaeta bellidiflora white-rayed pentachaeta	Endangered	Endangered	List 1B.1	Valley and foothill grassland, coastal scrub, coastal prairie	MNT, MRN*, SCR*, SMT	March-May	**NONE.** Nearest extant occurrence north of Santa Cruz near Eagle Rock. Presumed extirpated in Santa Cruz County. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Perideridia gairdneri ssp. *gairdneri* Gairdner's yampah	None	None	List 4.2	Moist sites in coastal prairie, broadleaved upland forest, chaparral, valley and foothill grassland, vernal pools	CCA, DNT, KRN, LAX*, MEN, MNT, MRN, NAP, ORA*, SBT, SCL, SCR, SDG*, SLO, SMT(*?), SOL, SON	June-October	**MODERATE.** Suitable coastal prairie, annual grassland and seasonal wetland/seep habitat located within the Study Area. However, despite known occurrences several linear miles north and northeast of the Study Area, this species was not observed during June 2019 or focused rare plant surveys or July/August 2019 wetland delineation site visits.
Piperia michaelii Michael's rein orchid	None	None	List 4.2	Coastal bluff scrub, closed cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest	ALA, CCA, HUM, MNT, MRN, SBT, SCR, SCZ, SFO, SLO, SMT	May-August	**LOW.** Not observed in coyote brush scrub habitat and unlikely to be present due to the clayey soils as this species tend to occur in sandy and/or gravelly soils. Not observed during June 2019 or May 2020 focused rare plant surveys.
Piperia yadonii Yadon's rein orchid	Endangered	None	List 1B.1	Coastal bluff scrub, closed-cone coniferous forest, chaparral (maritime); sandy	MNT	February-August	**NONE.** Suitable sandy soils not present within the Study Area. Occurrences mostly located in Monterey County south of the Pajaro River. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Plagiobothrys chorisianus var. chorisianus Choris' popcorn-flower	None	None	List 1B.2	Moist places in chaparral, coastal prairie, coastal scrub	ALA(*?), SCR, SFO, SMT	March-June	**LOW.** This species is primarily limited to mesic coastal prairie grassland which is not present within the Study Area. Nearest known extant occurrence documented at Watsonville Municipal airport. However, this species was not observed during June 2019 or May 2020 focused rare plant surveys.
Plagiobothrys chorisianus var. *hickmanii* Hickman's popcorn-flower	None	None	List 4.2	Moist places in closed-cone coniferous forest, chaparral, coastal scrub, marshes and swamps, vernal pools	MNT, SBT, SCL, SCR, SLO, SMT?	April-June	**NONE.** Very low-quality seasonal wetland habitat within northernmost portion of the Study Area. However, nearest documented extant occurrence in Santa Cruz Mountains north of Scotts Valley. This species was not observed during June 2019 or May 2020 focused rare plant surveys.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Plagiobothrys diffusus San Francisco popcornflower	None	Endangered	List 1B.1	Coastal prairie, valley and foothill grassland	ALA, SCR, SFO*, SMT	March-June	**LOW.** Potential for occurrence in remnant coastal prairie within the Study Area. However, the degraded nature of most grassland habitat within the Study Area is not likely to support this species. An unconfirmed occurrence of this species is listed by CNPS in the Watsonville West quadrangle. However, this species was not observed during June 2019 or May 2020 focused rare plant surveys.
Polygonum hickmanii Scotts Valley polygonum	Endangered	Endangered	List 1B.1	Valley and foothill grassland; sandstone	SCR	May-August	**NONE.** This sandstone specific species is known only from two small populations in Scotts Valley. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Ranunculus lobbii Lobb's aquatic buttercup	None	None	List 4.2	Cismontane woodland, North Coast coniferous forest, valley and foothill grassland, vernal pools; mesic areas	ALA, CCA, MEN, MRN, NAP, SCL, SOL, SON	March-April (May)	**NONE.** Not known from Santa Cruz County. Primarily occurs in vernal pools not supported by the Study Area. This species was not observed during May 2020 focused rare plant surveys.
Rosa pinetorum pine rose	None	None	List 1B.2	Closed cone coniferous forest	MNT, SCR	May-July	**NONE.** Suitable coniferous forest habitat not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Sanicula hoffmannii Hoffmann's sanicle	None	None	List 4.3	Broadleaved upland forest, mixed evergreen forest, chaparral, coastal scrub; serpentinite or clay	MNT, SBA, SCR, SCZ, SLO, SMT, SRO	March-May	**LOW.** Marginal coyote brush scrub habitat unlikely to support this species. Nearest known extant occurrence at Sunset Beach State Park southwest of the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Sidalcea malachroides maple-leaved checkerbloom	None	None	List 4.2	Broadleaved upland forest, coastal prairie, coastal scrub, valley and foothill grassland; sandy areas	HUM, MEN, MNT, SCL, SCR, OR	May-August	**NONE.** Although coastal prairie grassland is present, this species usually occurs in broadleaved forests with sandy soils which are not found in the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Streptanthus albidus ssp. *peramoenus* most beautiful jewelflower	None	None	List 1B.2	Chaparral, cismontane woodland, valley and foothill grassland; serpentinite	ALA, CCA, MNT, SCL, SLO	(March) April-September (October)	**NONE.** Serpentine soils not present within the Study Area. Not known from Santa Cruz County. This species was not observed during June 2019 or May 2020 focused rare plant surveys.

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period[7]	Potential for Occurrence
Trifolium buckwestiorum Santa Cruz clover	None	None	List 1B.1	Coastal prairie; margins of broadleaved upland forest, cismontane woodland	MEN, MNT, SCL, SCR, SMT, SON	April-October	**LOW.** Suitable mesic coastal prairie habitat is very limited within the Study Area. However, the nearest known extant occurrence in a similar habitat type is approximately 9 miles north of the Study Area in Pogonip Park. This species was not observed during June 2019 or May 2020 focused rare plant surveys.
Tifolium hydrophyllum saline clover	None	None	List 1B.2	Marshes and swamps, mesic valley and foothill grassland, vernal pools; alkaline soils	ALA, COL(?), MNT, NAP, SBT, SCL, SCR, SLO, SMT, SOL, SON	April-June	**NONE.** This species is endemic to alkaline soils which are not present within the Study Area. This species was not observed during June 2019 or May 2020 focused rare plant surveys.

[1]Nomenclature follows Baldwin et al (2012) Hickman (1993); Tibor (2001); California Native Plant Society (2020).
[2]U.S. Fish and Wildlife Service (2020 a, b, c).
[3]Section 1904, California Fish and Game Code (California Department of Fish and Game 2020 a).
[4]Tibor (2001); California Native Plant Society (2020).
CNPS Lists: List 1A: Presumed extinct in California. List 1B: Rare, Threatened, or Endangered in California and elsewhere. List 2: Rare, Threatened, or Endangered in California, more common elsewhere. List 3: Plants about which more information is needed. List 4: Plants of limited distribution: a watch list.
Threat Code extensions: .1: Seriously endangered in California. .2: Fairly endangered in California. .3 Not very endangered in California.
[5]Thomas (1960); Munz and Keck (1973); Hickman (1993); Baldwin et al (2012); Tibor (2001); California Native Plant Society (2020); and unpublished information.
[6]Tibor (2001); California Native Plant Society (2020); and unpublished information; counties abbreviated by a three-letter code (below); occurrence in other states as indicated.
[7]Munz and Keck (1973); Tibor (2001); California Native Plant Society (2020)

* Presumed extinct in these counties or states.

ALA: Alameda
AMA: Amador
BUT: Butte
CCA: Contra Costa
COL: Colusa
DNT: Del Norte
FRE: Fresno
GLE: Glenn
HUM: Humboldt
KRN: Kern
LAK: Lake
LAX: Los Angeles
MAD: Madera
MEN: Mendocino
MER: Merced
MNT: Monterey
MOD: Modoc
MPA: Mariposa
MRN: Marin
NAP: Napa
NEV: Nevada
ORA: Orange
PLA: Placer
PLU: Plumas
RIV: Riverside
SAC: Sacramento
SBA: Santa Barbara
SBD: San Bernardino
SBT: San Benito
SCL: Santa Clara
SCR: Santa Cruz
SCZ: Santa Cruz Island (SBA Co.)
SDG: San Diego
SFO: San Francisco
SHA: Shasta
SIE: Sierra
SIS: Siskiyou
SJQ: San Joaquin
SLO: San Luis Obispo
SMT: San Mateo
SOL: Solano
SON: Sonoma
SRO: Santa Rosa Island (SBA Co.)
STA: Stanislaus
SUT: Sutter
TEH: Tehama
TRI: Trinity
TUL: Tulare
TUO: Tuolumne
VEN: Ventura
YOL: Yolo
YUB: Yuba

APPENDIX B. SENSITIVE WILDLIFE SPECIES WITH POTENTIAL TO OCCUR

Appendix B. Conservation status, habitat requirements, and potential to occur for sensitive wildlife species in the vicinity of the proposed Lee Road Trail Project, Watsonville, Santa Cruz County, California.

Common Name *Scientific Name*	**Status** Federal	State	Other	**Habitat Requirements**	**Potential Occurrence**
AMPHIBIANS AND REPTILES					
(south-) western pond turtle (WPT) *Actinemys pallida = Emys marmorata**		SC	S3	Found in ponds, marshes, rivers, streams, and irrigation ditches containing aquatic vegetation; usually seen sunning on logs, banks, or rocks. Moves up to 3-4 miles within a creek (or slough) system, especially during "walk-abouts" before a female lays eggs; nests up to several hundred feet from aquatic habitat, in woodlands, grasslands, or open forest (Holland and Bury 1998).	**Possible** The WPT is known to occur in Struve Slough (CNDDB 2020a,b). A gravid female was found on Main Street near Struve Slough in 2019 and was relocated back to Struve Slough near Lee Road (Reis 2020). Known from Pinto Lake and the Pajaro River (Mori 2018; CNDDB 2019a,b)
Santa Cruz black salamander *Aneides niger*	-	SSC	S3	Mixed deciduous woodland, coniferous forests, and coastal grasslands. Found under rocks near streams, in talus, under damp logs, and other objects. In Santa Cruz, found near water under rocks near streams, seeps, and springs (Stebbins and McGinnis 2012, CDFW CWHR 2014 and 2016, Nafis 2018).	**Not Expected** Known from Green Valley Road in North Watsonville (CNDDB 2020a,b) and Ellicott Slough >3.5 km (2 mi) northwest (Steiner 2018). No suitable habitat is present within the Study Area.
Santa Cruz long-toed salamander *Ambystoma macrodactylum croceum*	FE	SE/FP	-	Shallow ponds with emergent and submerged vegetation for cover during the aquatic phase of their life. In terrestrial phase, require woodlands with a dense understory and abundant burrows (Ruth 1988, USFWS 1999 and 2009).	**Not Expected** Nearest breeding locations are from the Ellicott-Buena Vista Ponds, >3.5 km (2 mi) northwest.
California tiger salamander *Ambystoma californiense*	FT	SE	-	Seasonal pools, stock ponds and detention basins, and ditches with nearby upland grasslands and/or open woodlands within Central California. May migrate over 1 mile to reach breeding ponds (USFWS 2003).	**Not Expected** Nearest breeding locations are from Ellicott-Buena Vista Ponds, >3.5 km (2 mi) northwest.
California red-legged frog *Rana draytonii*	FT	SC	S2S3	Requires the presence of surface water until mid to late summer for reproduction; occupies ephemeral and/or perennial water with standing or slow-moving flows. Upland habitat includes leaf litter, dense grassland, small mammal burrows, irrigated agricultural fields, and greenhouses. Adults are known to travel up to 2 miles overland between aquatic sites (USFWS 2002, Fellers and Kleeman 2007, USFWS 2010).	**Present** Known to occur in West Branch Struve Slough, Struve Slough, Hanson's Sough, lower Harkins Slough, and Watsonville Slough. Breeding in 2020 was documented in channelized Watsonville Slough and, further from the proposed project area, in lower Harkins Slough (CNDDB 2020a,b, Kittleson 2020).
BIRDS					
bald eagle *Haliaeetus leucocephalus* (nesting and wintering)	-	SE/FP	G5S3	Typically breeds in forested areas adjacent to large bodies of water. Nests in trees in mature and old-growth forest with some habitat edge, relatively close (usually <2 km) to water with suitable foraging opportunities (diversity, abundance, and vulnerability of prey base). For perching, prefers tall, mature coniferous or deciduous trees with a wide view of the surroundings (Buehler 200).	**Possible** Known to nest in lower Harkins Slough and have been observed there in 2019 and 2020 (Pers. Obs. 2020; ebird 2020). The bald eagle may forage over the sloughs and grasslands within the Study Area. Offspring may nest in the vicinity.
ferruginous hawk *Buteo regalis* wintering	BCC			Overwinters in open terrain from grassland to desert. In California utilizes grasslands and arid areas where ground squirrels, pocket gophers, or other small mammals are abundant May roost communally (Ng. et al. 2020).	**Not Expected** Recent ebird (2018 and 2019) winter records from Watsonville airport and Pajaro Dunes (2015). Records from the sloughs are older; most recent (2002) from Harkins Slough.

Common Name *Scientific Name*	Status			Habitat Requirements	Potential Occurrence
	Federal	State	Other		
northern harrier *Circus cyaneus* (nesting)	-	SSC	S3	Ground nester; grasslands, sloughs, wet meadows, savanna, prairies and marshes (Smith et al. 2011).	**Possible** Recent occurrence records from CDFW Reserve and Struve Slough (ebird 2020). Grasslands and agricultural fields provide foraging and potential nesting habitat.
white-tailed kite *Elanus leucurus*	-	FP	S3S4	Nests in trees on the margins of open areas including grasslands and sloughs containing a high abundance of small mammals and lizards (Dunk 1995).	**Present** Observed hunting and vocalizing during June 2019 survey and roosting in a snag near Chivos Pond during September 2019 survey. Tree stands within and adjacent to the Study Area provide potential nesting habitat. Grasslands with small mammals present provide foraging habitat.
American peregrine falcon *Falco peregrinus anatum*	BCC	FP	S3S4	Inhabits open wetlands near cliffs. Also occurs in cities and utilizes buildings and bridges for nest sites (White et al. 2002).	**Not Expected** Recent (2016 and 2017) occurrence records are from from West Branch Struve Slough and Struve Slough primarily outside of breeding season (ebird 2020). May forage over the CDFW Reserve. The Study Area provides only marginal nesting habitat for this species.
western burrowing owl *Athene cunicularia* Burrow sites and some wintering sites	BCC	SSC	S3	Found in open areas with low-growing vegetation including annual and perennial grasslands, deserts, open scrub habitats, and agricultural fields with suitable burrows. Burrows of fossorial mammals are an essential component of their nesting and wintering habitat, but they may also use artificial structures such as culverts, openings in asphalt pavement, woody debris/rock piles, and crevices in stacks of straw bales (Poulin et al. 2011).	**Possible** Recent (December 2019) wintering occurrence records are from grasslands near Pajaro Valley High School (ebird 2020). Grassland within the Study Area provides potential wintering habitat. Breeding activities are extirpated from Santa Cruz County (CBD et al. 2003; Townsend and Lenihan 2007; Trulio 2018); the most recent breeding record is from 1987 at UCSC (CBD et al. 2003; Santa Cruz Bird Club 2013).
short-eared owl *Asio flammeus* (nesting)		SSC	S3	Nesting habitat associated with open country supporting cyclic small mammals (voles); in California, typically prairie, grasslands, and agricultural areas. Nest sites are dry with enough vegetation to conceal the nest and female. Non-breeding habitat includes weedy fields, marshes, and more disturbed areas such as quarries,woodlots and gravel pits (Wiggins et al. 2020).	**Not Expected** Recent fall and winter (2015 and 2019) occurrence records from Struve Slough (ebird 2020). Uncommon and erratic breeder in central coastal California (Wiggins et al. 2020).
olive-sided flycatcher *Contopus cooperi* (nesting)	BCC	SSC	-	Inhabits woodland and forest habitats. Nests in tall trees, generally near the edges and openings to meadows, grasslands, wetlands, and ponds (Altman and Sallabanks 2012).	**Not Expected** Study Area lacks requisite habitat features. Known from Watsonville Sough approximately 1.5 km (0.9 miles) north-northeast of the Study Area.
grasshopper sparrow *Ammodramus savannarum* (nesting)	-	SSC	S3	Associated with short to medium-height grasslands with little or no shrub cover. May be found in pastures and agricultural fields. Feeds on insects and seeds. Nest on ground in grassland habitats between April and May (Vickery 1996).	**Possible** 2018 occurrence record from the CDFW Reserve (ebird 2020). Grassland and agricultural fields within the Study Area provide potential habitat. Ebird record from May 2020 at Kelly Thompson Ranch apprroximately 9 km (5.6 miles) from the Study Area.
loggerhead shrike *Lanius ludovicianus* (nesting)	BCC	SSC	-	Grassland, agricultural fields, and shrub habitats with small reptiles and insects. Nests in dense trees or shrubs adjacent to open areas. Known to impale prey items on barbed wire fences (Yosef 1996).	**Not Expected** Numerous records from the CDFW Reserve, Struve Slough, Hanson's Slough and other nearby locations. Grasslands within the Study Area provide potential foraging habitat. No recent breeding records in Santa Cruz County.
tricolored blackbird *Agelaius tricolor* (nesting colony)	BCC	ST	S1S2	Colonial breeders. Breeding sites require nearby water, suitable nesting substrate, and open-range foraging habitat of natural grassland, shrubland/woodland, or agricultural cropland (Meese and Beedy 2015, Beedy et al. 2017).	**Possible** Known from the CDFW Reserve, Struve Slough, Hanson's Slough, (CNDDB 2020a,b), Harkins Slough (ebird 2020); records are from outside of breeding season. No confirmed breeding in Santa Cruz County since 2008 (Meese 2017).

Common Name *Scientific Name*	Status			Habitat Requirements	Potential Occurrence
	Federal	State	Other		
Lawrence's goldfinch *Spinus lawrencei* (nesting)	BCC	-	S3S4	Typically occupies arid and open woodlands within the near vicinity of three habitat components: chaparral or other brushy areas; tall annual weed fields; and water source such as stream, small lake, or farm pond (Watt et al. 2016).	**Possible** Individual observed during 2019 surveys. Also known from Struve Slough and Harkins Slough (ebird 2020). Nesting on central coast is uncommon.
oak titmouse *Baeolophus inornatus* (nesting)	BCC	-	-	Nests in natural cavities, old woodpecker holes, artificial nest boxes from mid-March through April. Inhabits oak woodlands along the Pacific Slope. Requires elevated perches for foraging and eating (Cicero 2000, Cicero et al. 2017).	**Possible** Known from the CDFW Reserve(2016), Struve Slough (2020), and the channelized section of Watsonville Slough (2013) all within the Project Area (ebird 2020). Trees and posts with cavities, including the non-native forest along Watsonville Slough provide marginal potential breeding habitat.
nesting birds	-	CFGC	-	Variety of scrub, marsh, riparian, and grassland habitats.	**Present** Grasslands, scattered coyote bush, riparian, and tree stands within or adjacent to the Study Area provide nesting habitat for birds.
MAMMALS					
Long-legged myotis *Myotis volans*	-	-	HP	Roosts primarily in large hollow tree snags or live trees with exfoliating bark; also uses rock crevices, mines, and buildings.	**Not Expected** Study area lacks mature woodland and forest habitats that this species favors. Marginal potential roost sites available in non-native forest along channelized Watsonville Slough or outside the Study Area in trees near Chivos Pond.
Western red bat *Lasiurus blossevillii*	-	SSC	HP	Roosts in foliage, primarily in riparian and wooded habitats.	**Not Expected** Study area lacks mature riparian and/or woodland. Marginal potential roost sites available in non-native forest along channelized Watsonville Slough or outside of the Study Area in trees near Chivos Pond.
common roosting bat species	-	CFGC	-	Variable	**Possible** Trees near Chivos Pond and non-native forest provides potential roosting habitat.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	-	SSC	-	Associated with riparian, oak woodland and redwood forest habitats and edge habitats. Builds houses from sticks and leaves under or in buildings and trees, in hollow trees, or in tree canopy (Sakai and Noon 1993).	**Possible** Coastal scrub/grassland ecotones within the CDFW Reserve provide potential habitat.
American badger *Taxidea taxus*	-	SSC	-	Occurs in open, uncultivated grasslands and meadows, and open stages of shrub and forest habitats with dry with friable soils. Forages on burrowing rodents, insects, and ground nesting birds (CDFW CWHR 2008, Quinn 2015).	**Not Expected** Historic record from 1909 approximately 3.3 km (2 miles) west of the Study Area (CNDDB 20120a,b). Potential habitat in the vicinity is fragmented by agriculture, roads, and development.

NOTES:

* The Special Animals List (CDFW CNDDB 2020) shows this turtle as *Emys marmorata* - western pond turtle. It does not track the species by the two formerly recognized subspecies nor does it recognize the Phillip et al. (2014) description of two species of pond turtles (as Nafis 2018 does): Previously, the western pond turtle, *Actinemys marmorata,* was split into two subspecies: *A. m. marmorata* and *A. m. pallida*. The single species has been split into two full species, corresponding to the previous two subspecies - *Actinemys marmorata*, and *Actinemys pallida*. The authors "...propose using the name *Emys marmorata* for all populations north of the San Francisco Bay area plus populations from the Great Central Valley north. *Emys pallida* is restricted to those populations inhabiting the central coast range south of the San Francisco Bay area to the species' southern range boundary, including the Mojave River."

Federal Status

FE = Endangered: Any species, which is in danger of extinction throughout all, or a significant portion of its range (USFWS 2018a).
FT = Threatened: Any species, which is likely to become an endangered species within the foreseeable future throughout all, or a significant portion of its range (USFWS 2018a).
FR = Under Review: A petition has been received by USFWS with substantial scientific information indicating that listing under the ESA may be warranted.
BCC = Species of migratory nongame birds that are considered to be of concern in the United States because of (1) documented or apparent population declines, (2) small or restricted populations, (3) dependence on restricted or vulnerable habitats (USFWS 2008).

State Status

SE = Endangered: A native species or subspecies of animal which is in serious danger of becoming extinct throughout all, or a significant portion of its range, due to loss of habitat, change in habitat, over exploitation, predation, competition and/or disease (CDFW 2020b).
ST = Threatened: A native species or subspecies of bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Fish & G. Code, §2067 [CDFW 2020b, Meese 2018 (tricolored blackbird-listing pending)]
SSC = CDFW Species of Special Concern: Designated because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction (CDFW 2020c, CDFW CNDDB 2020).
FP = Fully Protected[18]: State's initial protection for animals that were rare or faced possible extinction. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.
CFGC = California Fish and Game Code (2016):
3503 - Protects active nests and eggs of birds from take, possession, or needless destruction
3503.5. - Protects birds of prey (Orders Falcinoformes and Strigiformes)
Section 86; 2000; 2014; 3007; 4150, and Title 14 CCR - Protects non-listed bat species, including individual roosts and maternity colonies.

Other

NatureServe Ranking[19]: S1 = Critically Imperiled—Critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
S2 = Imperiled—Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.
S3 = Vulnerable—Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state.

[18] More information on Fully Protected species and the take provisions can be found in the Fish and Game Code, (birds at §3511, mammals at §4700, reptiles and amphibians at §5050, and fish at §5515). Additional information on Fully Protected fish can be found in the California Code of Regulations, Title 14, Division 1, Subdivision 1, Chapter 2, Article 4, §5.93.

[19] Originally developed by The Nature Conservancy and now maintained and recently revised by NatureServe. Includes a **Global rank** (G-rank), over the taxon's entire distribution, and a **State rank** (S-rank), over its state distribution. For subspecies and varieties, there is also a "T" rank describing the global rank for the infraspecific taxon. Criteria are used to assign element ranks, from G1 to G5 for the Global rank and from S1 to S5 for the State rank, taking into account rarity, threats, and trends (CDFW CNDDB 2020).

APPENDIX C. VASCULAR PLANT SPECIES OBSERVED

Appendix C. List of vascular plant species observed during June 2019 and May 2020 focused rare plant surveys of the proposed Lee Road Trail Study Area, Watsonville, California.

Scientific name	**Common name**
Alium vineale	vineyard onion
Anthemis cotula	dog fennel
*Avena barbata**	slender wild oat
Baccharis pilularis	**coyote brush**
*Brassica nigra**	black mustard
Bromus carinatus* ssp. *carinatus	**California brome grass**
Bromus catharticus	rescue grass
Bromus diandrus	ripgut brome
Bromus hordeaceus	soft chess
Cardamine oligosperma	**Idaho bittercress**
*Carduus pycnocephalus**	Italian thistle
Carex barbarae	**Santa Barbara sedge**
Carex obnupta	**slough sedge**
Carex tumilicola	split awn sedge
Chichorium intybus	chicory
Cirsium vulgare	bull thistle
*Conium maculatum**	poison hemlock
Convolvulus arvensis	bindweed
*Cynara cardrunculus**	artichoke thistle
*Cynodon dactylon**	Bermuda grass
Cyperus eragrostis	**tall flatsedge**
Dactylis glomerata	orchardgrass
Danthonia californica	**California oatgrass**
Elymus triticoides	**beardless wild rye**
Elymus X *Triticum*	“regreen” sterile wheat
Epilobium brachycarpum	**willowherb**
Equisetum telmatia	**horsetail**
Eriodium cicutarium	redstem filaree
Eschscholzia californica	**California poppy**
Eucalyptus camaldulensis	red gum
Eucalyptus globulus	blue gum
Festuca bromoides	brome fescue
*Festuca myuros**	six wees fescue
*Festuca perennis**	Italian ryegrass
*Foeniculum vulgare**	fennel
Frangula californica	**coffeeberry**
Geranium dissectum	cutleaf geranium
Geranium mole	crane’s bill geranium
Helminthotheca echioides	prickly ox tongue
Hemizonia congesta* ssp. *luzulifolia	**hayfiled tarweed**
Hordeum marinum ssp. *gussoneaneum**	Mediterranean barley
Hordeum murinum ssp. *leporinum*	foxtail barley

Scientific name	**Common name**
Hordeum vulgare	common barley
*Hypochaeris radicata**	rough cat's ear
Juncus patens	**spreading rush**
Lactuca serriola	wild lettuce
Lemna sp.	**duckweed**
*Lepidium draba**	whitetop
Lobularia martima	sweet alyssum
Lotus corniculatus	bird's foot trefoil
*Ludwigia peploides**	marsh purslane
Lysimachia arvensis	scarlet pimpernel
Malva niceaeensis	bull mallow
Malva parviflora	cheeseweed
Matricaria discoidea	**pineapple weed**
*Medicago polymorpha**	bur clover
Myoporum lateum	Ngaio tree
Opuntia ficus-indica	tuna cactus
Paspalum dilitatumpasp	dallis grass
Persicaria amphibia	**water smartweed**
*Phalaris aquatica**	harding grass
Pinus radiata	Monterey pine
Plantago coronopus	cut leaf plantain
Platago lanceolata	English plantain
Poa annua	annual bluegrass
Polygonum aviculare ssp. *depressum*	prostrate knotweed
Quercus agrifolia	**coast live oak**
Raphanus sativus	wild radish
Rosa californica	**California wild rose**
*Rubus armeniacus**	Himalayan blackberry
Rubus ursinus	**Pacific blackberry**
*Rumex acestosella**	sheep sorrel
Rumex conglomeratus	clustered dock
Rumex crispus	curly dock
Rumex pulcher	fiddledock
Salix lasiolepis	**arroyo willow**
Shoenoplectus californica	**California bulrush**
Silybum marianum	milk thistle
Sonchus asper	prickly sow thistle
Sonchus oleraceus	sow thistle
Sparganium eurycarpum	**broadfruit bur reed**
Spergularia rubra	purple sand spurry
Stipa miliacea var. *miliacea*	smilo grass
Symphyotrichium chilense	***pacific aster***
Toxicodendron diversilobum	**poison oak**
Tragopogon porrifolius	salsify
Trifolium agustifolium	narrowleaved clover

Scientific name	**Common name**
Trifolium fragiferum	strawberry clover
Typha latifoia	**broadleaved cattail**
Vicia benghalensis	purple vetch
Vicia sativa ssp. *sativa*	common vetch
Vitus vinifera	cultivated grape
Yucca sp.	yucca

Native species in bold
*indicates Cal-IPC moderate or high priority invasive weed.

APPENDIX D. AVIAN SPECIES OBSERVED DURING 2019 SURVEYS

Appendix E. Avian species observed or heard vocalizing during 2019 and 2020 bird surveys of the proposed Lee Road Trail Study Area, Watsonville, Santa Cruz County, CA.

Common Name	Scientific Name	Cons. Status	CDFW Reserve	Ag. Fields/ Farm Buildings	Chivos Pond	Lee Road N. of Slough	Lee Road S. of Slough
Family: Anatidae							
Mallard	*Anas platyrhynchos*		FO				V
Northern Shoveler	*Anas clypeata*					O	
Ruddy Duck	*Oxyura jamaicensis*					O	
Family: Podicipedidae							
Pied-billed Grebe	*Podilymbus podiceps*		O			O	
Family: Cathartidae							
Turkey Vulture	*Cathartes aura*			O			
Family: Accipitridae							
White-tailed Kite	*Elanus leucurus*	FP	O, V	O, V	O		
Red-shouldered Hawk	*Buteo lineatus*						
Osprey	*Pandion haliaetus*			FO, F			
American Kestrel	*Falco sparverius*		O			O	
Family: Rallidae							
American Coot	*Fulica americana*						V
Family: Phalacrocoracidae							
Double-crested	*Phalacrocorax*		FO			O	
Family: Pelicanidae							
American White Pelican	*Pelecanus*					O	
Family: Ardeidae							
Great Blue Heron	*Ardea herodias*				O		
Great Egret	*Ardea alba*				O		
Family: Charadriidae							
Spotted Sandpiper	*Actitis macularius*		O			O	
Family: Laridae							
Caspian Tern	*Hydroprogne caspia*		FO			O	
Family: Columbidae							
Mourning Dove	*Zenaida macroura*		O	O			
Eurasian Collared	*Streptopelia decaocto*						O, V
Family: Trochilidae							
Anna's Hummingbird	*Calypte anna*		O			O	
Family: Tyrannidae							
Pacific-slope Flycatcher	*Empidonax difficilis*					O	V
Black Phoebe	*Sayornis nigricans*		O, B				
Family: Corvidae							
California Scrub-Jay	*Aphelocoma*				O		
American Crow	*Corvus*		FO	O			
Family: Hirudinidae							
Tree Swallow	*Tachycineta bicolor*		O				O
Northern Rough-winged	*Stelgidopteryx*		O	O			

Barn Swallow	*Hirundo rustica*			O			
Cliff Swallow	*Petrochelidon*		O	O		O	
Family: Paridae							
Chestnut-backed	*Poecile rufescens*						V
Family: Aegithalidae							
Bushtit	*Psaltriparus minimus*		O, V				O, V, B
Family: Turdadae							
American Robin	*Turdus migratorius*						V
Family: Mimidae							
Northern Mockingbird	*Mimus polyglottos*			O, V			O
California Thrasher	*Toxostoma redivivum*					O	
Family: Sturnidae							
European Starling*	*Sturnus vulgaris*			O, B			
Family: Troglodytidae							
Marsh Wren	*Cistothorus palustris*		V			O, V	
Family: Parulidae							
Orange-crowned	*Oreothlypis celata*		O				
Yellow Warbler	*Setophaga petechia*			O			
Common Yellowthroat	*Geothlypis trichas*			O			
Wilson's Warbler	*Cardellina pusilla*		O				V
Family: Emberizidae							
California Towhee	*Melozone crissalis*		O				O
Song Sparrow	*Melospiza melodia*		O, V	O, V			O, V, B
Family: Icteridae							
Brown Headed Cowbird	*Molothrus ater*		O	O			
Red-winged Blackbird	*Agelaius phoeniceus*		O, V	O, V			
Brewer's Blackbird	*Euphagus*			O			
Family: Fringillidae							
Purple Finch	*Haemorhous*		O	V			V
House Finch	*Haemorhous*		O	O			O
Lawrence's Goldfinch	*Spinus lawrencei*	BCC	O, V	O			
Lesser Goldfinch	*Spinus psaltria*			O			
American Goldfinch	*Spinus tristis*						O, V, P
Family: Passeridae							
House Sparrow*	*Passer domesticus*			O			

*Non-native bird species

APPENDIX E. AMPHIBIAN SITE ASSESSMENT

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May 4, 2020

Erin McGinty
Ecosystems West
180 7th Ave
Santa Cruz, CA 95062

RE: CITY OF WATSONVILLE LEE ROAD TRAIL– ENDANGERED AMPHIBIANS ASSESSMENT

Dear Erin:

The purpose of this letter-report is to present the current understanding of known and potential habitat for endangered amphibians in relation to the Lee Road Trail project. These include California tiger salamander (CTS) (*Ambystoma californiense*), Santa Cruz long-toed salamander (SCLTS) (*A. macrodactylum croceum*) and California red-legged frog (*Rana draytoni*). This assessment does not include focused aquatic or upland surveys for these species.

METHODS

The habitat assessment was performed using the following protocols as guides: Interim Guidance on Site Assessment for Determining the Presence or a Negative Finding of the California Tiger Salamander, October 2003 (USFWS and CDFG 2003), Guidance on Site Assessment and Field Surveys to Detect Presence or Report a Negative Finding of the Santa Cruz Long-toed Salamander December 2012 (USFWS and CDFW 2012) and US Fish and Wildlife Service (USFWS), Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog, August 2005 (USFWS 2005). The assessment includes general upland and aquatic habitat descriptions adjacent to the project alignment and surrounding landscape, and relevant species observations.

The description of existing habitat conditions of the project alignment and surrounding landscape is based on a reconnaissance-level survey of the project alignment performed on 23 September 2019, by driving public roadways and walking certain sections. The principal habitats were identified and recorded in a field notebook and habitats within and adjacent to the project alignment were photographed. The California Natural Diversity Data base (CNDDB) and local studies were reviewed, and consultations with local biologists conducted to document relevant observations of CTS, SCLTS and CRF in the study area.

EXISTING CONDITIONS

Project Site

The proposed project alignment extends from near the intersection of Harkins Slough Road and Lee Road south-southeast along Lee Road and across Struve Slough to the railroad crossing (Figure 1). A short spur trail would be located along channelized Watsonville Slough from Lee Road through the Highway 1 underpass, connecting to the existing trail system associated with the Ohlone Parkway housing developments (Figure 1).

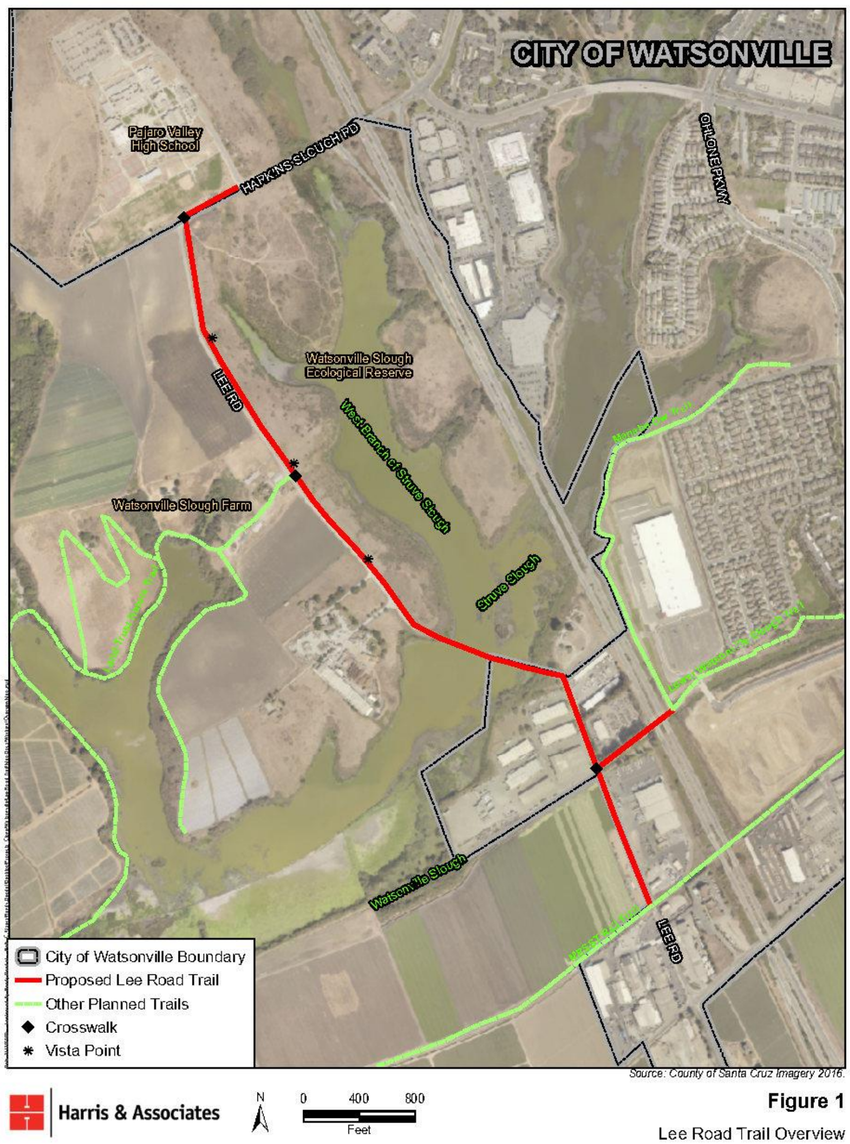


Figure 1. Lee Road Trail alignment.

For the purposes of this assessment, the discussion of aquatic and upland habitats, below, encompasses the landscape within 1.24 miles of the project alignment, per protocol guidelines, and is based on review of Google Earth aerials and field experience in the project area.

Aquatic Habitats. The principal aquatic habitats in the study area are Hanson Slough, Harkins Slough, Galligan Slough, Struve Slough, West Branch Struve Slough, Watsonville Slough and the Pajaro River (Figure 2). In addition, a series of water treatment ponds are located west of the Santa Cruz County Sheriff Rountree Medium Facility; three seasonal ponds are present on the Santa Cruz Land Trust Bryant-Habert conservation area; and numerous agricultural ditches border the neighboring farmlands. Except for the ponds and ditches, the slough system and the Pajaro River are largely perennial; the perennial nature of the sloughs is a relatively recent phenomenon, since the 2000s (B. Mori, pers. obs.). Moving southeasterly, the project alignment crosses Struve Slough, which inundates Lee Road (Figure 3), and terminates at Watsonville Slough, where the slough is channelized throughout much its length up- and downstream of Lee Road (Figures 4 and 5).

Uplands. East of SR 1, the landscape is dominated by urbanization, which completely surrounds the headwaters of Struve Sough and Watsonville Slough (Figure 2). West of SR1, the landscape is largely a mosaic of wetlands, farmlands and Department of Fish and Wildlife conservation areas, with scattered developments, including Pajaro Valley High to the north, Buena Vista Landfill and Rountree Medium Facility to the west, industrial and commercial uses along Lee Road, and the Watsonville Wastewater Treatment Plant adjacent to Pajaro River. South of Watsonville, farmlands are the dominant feature.

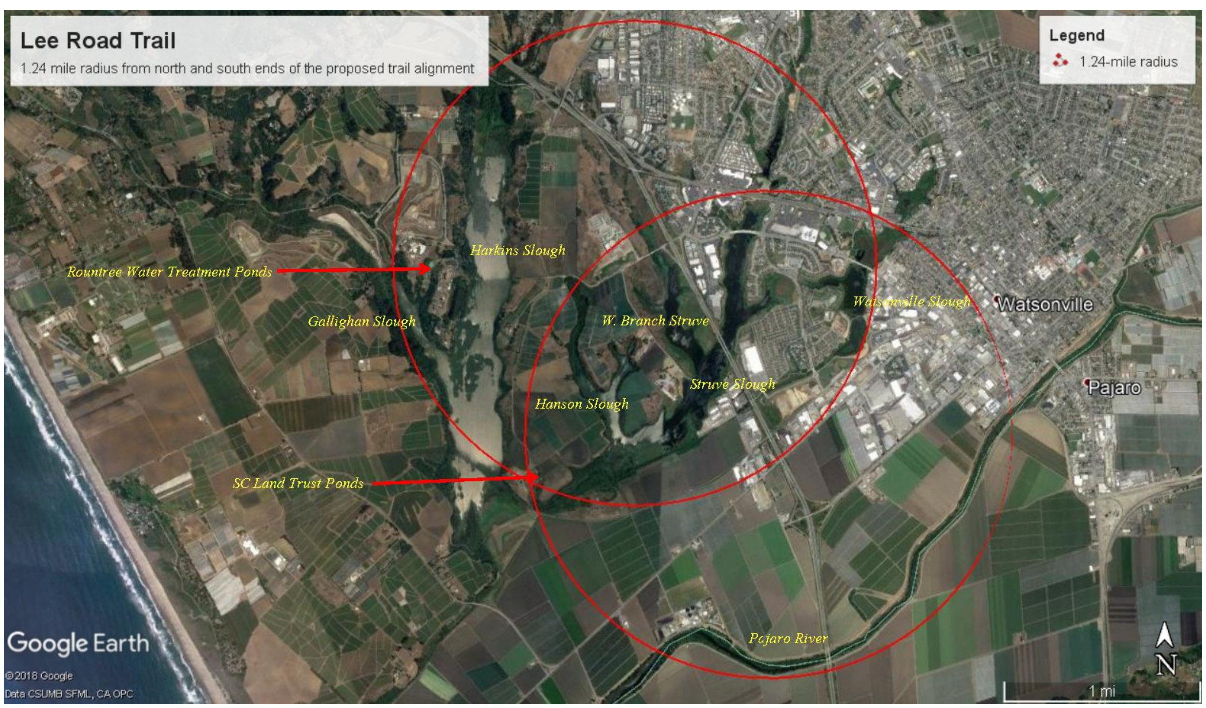


Figure 2. Aquatic habitats within 1.24 mile of the Lee Road Trail alignment.

Figure 3. Lee Road is submerged at Struve Slough. The view is looking from north to south.

Figure 4. Channelized section of Watsonville Slough, looking upstream from Lee Road.

Figure 5. Channelized section of Watsonville Slough, looking downstream from Lee Road.

ENDANGERED AMPHIBIANS – REGULATORY STATUS AND NATURAL HISTORY

California Tiger Salamander

The California tiger salamander is a Federal threatened species and State species of special concern (USFWS 2004; CDFG 2009). The population consists of three Distinct Population Segments (DPS) – the Santa Rosa DPS, Santa Barbara DPS and Central California DPS, all of which are federally listed as threatened or endangered (USFWS 2004; USFWS 2003). The California tiger salamander has disappeared from 55% of its historic range (Jennings and Hayes 1994). Presently, this species is distributed in the Central Valley from Yolo County south to Tulare County, and in the Coast Range valleys and lower foothills from Sonoma County south to Santa Barbara County (Shaffer 1991).

CTS primarily inhabit valley floor and foothill grasslands, open oak woodlands and scrub habitats encompassing vernal pools and seasonal ponds (Trenham 2001; USFWS 2000). Post-metamorphic individuals (i.e., adults and juveniles) live in rodent burrows in uplands for most of their lives (Trenham 2001; Trenham *et al* 2000; Loredo *et al* 1996). During the rainy season, typically November through March, adults migrate at night to aquatic breeding sites (Loredo and Van Vuren 1996), which include quiet waters of seasonal ponds, reservoirs, lakes and occasionally stream pools (Stebbins 2003). Based on a recent study (Searcy 2013), median migration distances were 49 m, 615 m, and 667 m for metamorphs, juveniles, and adults, respectively, and distances greater than 1 km are not considered rare (P. Trenham, California

Tiger Salamander Workshop 2011). Studies have estimated that 90% of the adult population occurs within 400m of the pond, whereas 90% of subadults are found within 600m of the breeding pond (Trenham and Shaffer 2005). In habitats encompassing several ponds, experienced adults may breed at more than one pond during their lifetime (Trenham *et al* 2001). The adults remain at the breeding pond from one day to several weeks, then return to upland refugia (Loredo and Van Vuren 1996). Males tend to arrive at breeding sites before females and stay at breeding sites longer (e.g., 6 – 8 weeks for males and 1 – 2 weeks for females)(Trenham *et al* 2000; Loredo and Van Vuren 1996; Shaffer 1993). Eggs are laid singly, or in small groups of up to four, on stalks of submerged vegetation or other objects (e.g., rocks woody material, etc.), typically along the shoreline. The eggs hatch in 10 days to approximately three weeks (USFWS 2000; Jennings and Hayes 1994; Storer 1925). The number of eggs deposited per female per breeding season ranges from around 400 – 1,300 (USFWS 2000). Larvae typically metamorphose in two to three months, from late spring to summer, when ponds begin to dry (USFWS 2000). Metamorphs emerge from ponds and seek shelter mostly in the immediate vicinity in burrows, cracks in the ground or under debris, but sometimes as far as 200m away, even in the absence of rain (Trenham 2001; Trenham and Shaffer 2005; Loredo *et al* 1996). During the rainy-season, the juveniles continue to disperse farther to seek refuge in upland areas within 640 m of the breeding pond. Adults live up to at least 10 years, but may take up to 4 – 5 years to reach sexual maturity (Trenham *et al* 2000). Females may not breed every year and some may only may breed once or twice during their lifetime (Trenham *et al* 2000).

Threats and reasons for the decline of this species include loss of breeding and upland habitat and habitat fragmentation due to agricultural and urban development; the introduction of bullfrogs (*Rana catesbeiana*) and predatory non-native fishes; use of larval forms as fishing bait; and hybridization with introduced non-native tiger salamanders (USFWS 2000; Stebbins 2003).

Santa Cruz Long-toed Salamander

The SCLTS was listed as endangered by the U.S. Fish and Wildlife Service in 1967 (USFWS 2004b), and subsequently in 1970 by the State of California under the California Species Preservation Act (Ruth 1989). The SCLTS is the southernmost subspecies of *Ambystoma macrodactylum* (Russell and Anderson 1956), and geographically isolated from the southern long-toed salamander (*Ambystoma macrodactylum sigillatum*) population, which is located 150 miles to the northeast in the Sierra Nevada (Russell and Anderson 1956). This species was first discovered in 1954 at Valencia Lagoon, near Aptos, in Santa Cruz County, California (Russell and Anderson 1956). The current known distribution of SCLTS is restricted to only southern Santa Cruz and northern Monterey Counties, within the coastal belt, and consists of six metapopulations (FWS 2009).

Adult and sub-adult SCLTS spend most of the year in upland refugia, including rodent burrows, leaf litter, underneath surface objects, and in rotting logs within dense oak woodlands, riparian vegetation and mesic coastal scrub (Ruth 1989). Adults migrate from upland habitats to seasonal/semi-perennial breeding ponds at night, during late fall and winter rains, generally from November through March. In contrast, juvenile dispersal is mostly confined to the first substantial fall rains, sometimes as early as August (M. Allaback, pers. comm.). SCLTS appear to travel in nearly straight lines, with marked individuals documented to migrate 0.6 mile from breeding ponds to upland habitat (USFWS 2004b; M. Allaback, pers. comm.). However, unmarked long-toed salamanders have been observed 1 mile from the nearest breeding pond (USFWS 2004b). Males usually precede females to the breeding site by one to two weeks, remain at the pond longer than females, and may mate with more than one female each season (Ruth and Tollestrup 1973; USFWS 2004b). Mating and egg-laying generally peak in January and February (USFWS 2004b). The female deposits 200 - 400 eggs singly on stems of emergent vegetation (Anderson 1967). After mating, the adults return to upland habitat within 6 - 12 weeks, typically by March or April (Ruth 1989; USFWS 2004b). Eggs hatch within 15 - 30 days and metamorphose into juveniles between May and September, depending on aquatic conditions. In drought years, larvae may perish prior to transformation due to insufficient water levels (Ruth 1989). Recently metamorphosed salamanders (metamorphs) typically seek terrestrial refuge immediately adjacent to the breeding pond, and remain until dispersing during the first fall rains, however, early rains may induce metamorphs to move up to 200 feet from the breeding pond (Ruth 1989; USFWS 2004b). Adults are estimated to live up to twenty years (Ruth 1989). A long life span and high reproductive output are believed to be adaptations which allow for populations to persist at seasonal breeding sites during prolonged periods of drought (Reed 1979; Ruth 1989).

Climatic changes over geologic time have restricted the distribution of the Santa Cruz long-toed salamander, making the species especially vulnerable to habitat loss resulting from agricultural and urban developments, predation from bullfrogs and non-native predatory fishes, as well as natural catastrophes related to climate and infestations (Ruth 1989; USFWS 2004b).

California Red-legged Frog

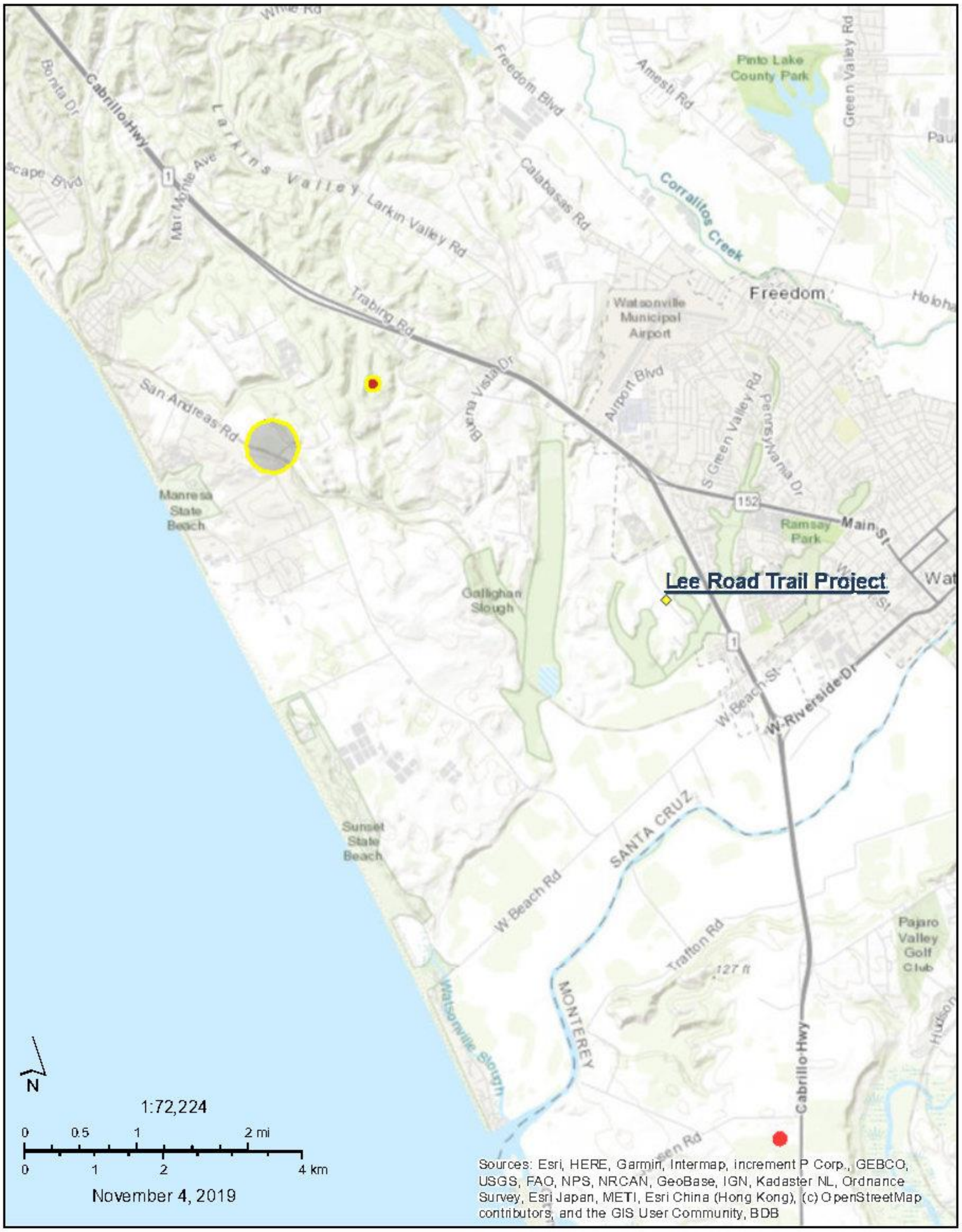
The California red-legged frog is a federal threatened species and a Priority 1 state species of special concern (CDFW 2017; Thomson *et al.* 2016; USFWS 2002). Historically, the statewide range of this species extended southward from the Marin County coast, and inland from Shasta County, south to Baja California (Jennings and Hayes 1994). However, CRF has been extirpated from 70% of its former range (USFWS 1996), and presently is found primarily in central coastal California, typically in natural and artificial ponds, quiet pools along streams, and coastal marshes (USFWS 1996). During the breeding season, optimal aquatic habitat is characterized by dense emergent or shoreline vegetation and a water depth of 2 feet or more (Hayes and Jennings 1988). However, seasonal ponds located in grasslands with little emergent/shoreline cover may also be used for breeding, where water levels permit the metamorphosis of larvae and rodent burrows offer cover (Thomson *et al.* 2016; USFWS 2002; pers. obs.). Breeding typically occurs between December and April, depending on annual environmental conditions and locality. Egg masses containing 2,000 - 5,000 eggs are usually deposited near the water surface on emergent vegetation, but occasionally on the pond bottom where attachment sites are absent. Eggs require 6 - 14 days to hatch, and metamorphosis generally occurs within 3.5 - 7 months of hatching, although larvae have been recorded to over-winter at some sites (Fellers, *et al.* 2001). Following metamorphosis, generally between July and September, juveniles reach 25 - 35 mm in size and do not travel far from aquatic habitats, if appropriate cover is present. Adult migrations and juvenile dispersal generally begin with the first rains of the weather-year, although all size classes will move in response to receding water at seasonal ponds. Radio telemetry data indicate that adults engage in straight-line movements irrespective of riparian corridors or topography, and they may move up to 1.7 miles between non-breeding and breeding sites (Bulger, *et al.* 2003; Fellers and Kleeman 2007). At permanent ponds, most CRF remain at the pond but often move up to 300 feet into surrounding uplands, especially following rains, when individuals may spend days or weeks in upland habitats (Bulger, *et al.* 2003). At seasonal breeding sites, frogs will move at least as far as the nearest suitable non-breeding habitat, e.g., riparian zone, marsh, etc. (Fellers and Kleeman 2007). CRF may take refuge in small mammal burrows, leaf litter, or other moist areas during periods of inactivity or when necessary to avoid desiccation (Rathbun, *et al.* 1993; Jennings and Hayes 1994).

Much of this species' habitat has undergone significant alteration by agricultural, urban development, and water projects, leading to the extirpation of many populations (USFWS 1996). Other factors contributing to the decline of red-legged frogs include their historical exploitation as food; competition and predation by bullfrogs (*Rana catesbeiana*); introduction of predatory fishes (Jennings and Hayes 1985; Hayes and Jennings 1988; Lawler, *et al.* 1999); and increased salinity of coastal breeding sites (Jennings and Hayes 1990). Chytrid fungus, while linked to the decline of some amphibian species, does not appear to have significantly impacted CRF (Thomson *et al.* 2016).

ENDANGERED AMPHIBIANS - LOCAL OCCURENCES

Fourteen records were identified in the study area, based on review of the CNDDB and consultations with local experts. These records are of breeding sites, as well as upland observations. These records are summarized in Table 1 of the Appendix and depicted on Figures 6 – 8).

CTS Records within 3.1 miles of the Lee Road Trail Project



Author: Bryan Mori Biological Consulting
Printed from http://bios.dfg.ca.gov

Figure 6. California tiger salamander locations within 3.1 miles of the Lee Road Trail Project site. Relevant records are outlined in yellow.

SCLTS Records within 3.1 miles of the Lee Road Trail Project

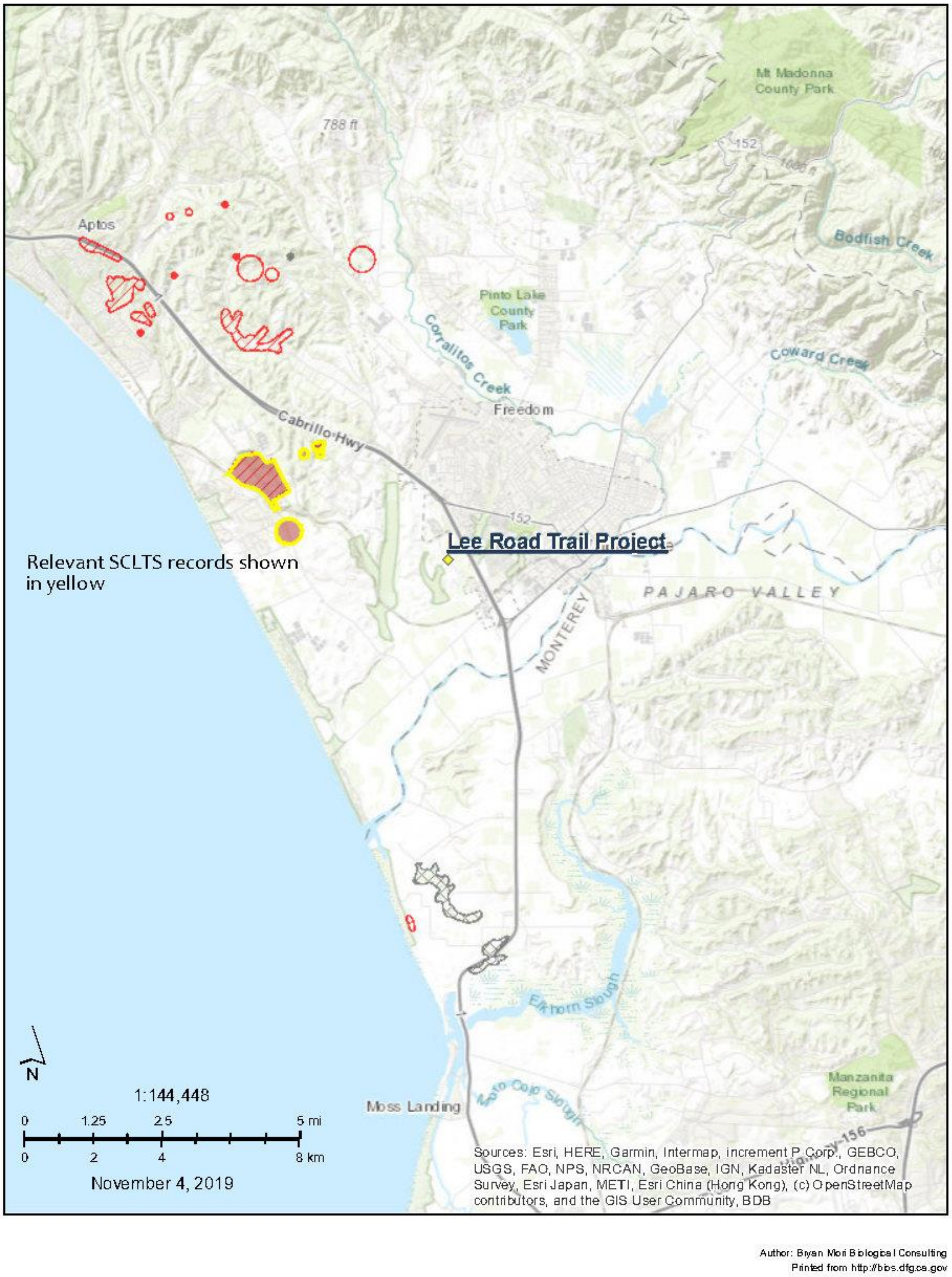
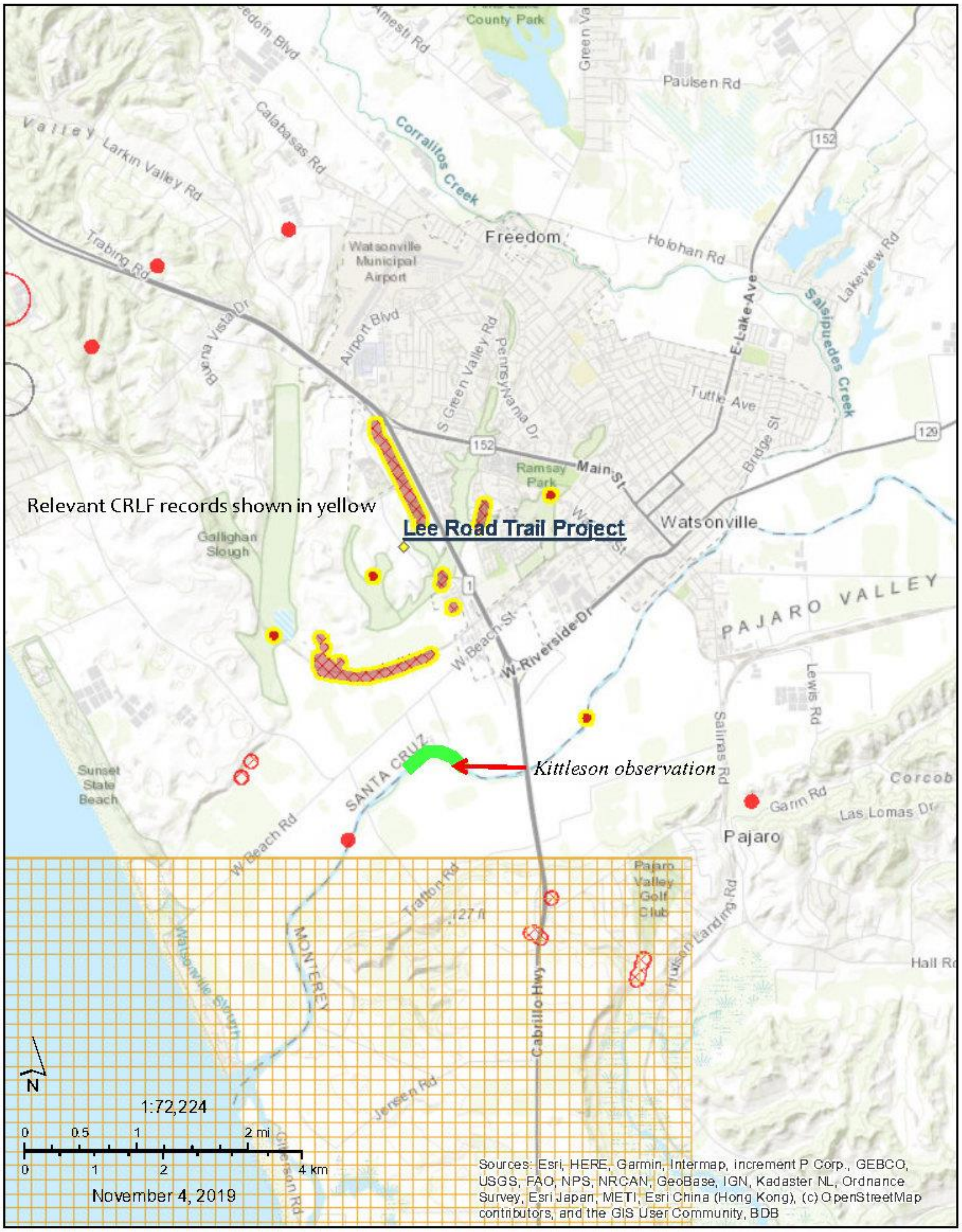


Figure 7. Santa Cruz long-toed salamander locations within 3.1 miles of the Lee Road Trail Project site.

CRLF Records within 1 mile of the Lee Road Trail Project



Author: Bryan Mori Biological Consulting
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Figure 8. California red-legged frog locations within 1 mile of the Lee Road Trail Project site.

DISCUSSION OF POTENTIAL IMPACTS

California Tiger Salamander and Santa Cruz Long-toed Salamander

The proposed trail alignment is not expected to result in direct or indirect impacts to CTS and SCLTS. The aquatic habitats associated with the trail project - West Branch Struve, Struve Slough and Watsonville Slough - lack suitable breeding habitat, due to their perennial nature and the pervasiveness of introduced predators, such as Louisiana crayfish (*Procambarus clarkii*), common carp (*Cyprinus carpio*), bullheads (*Ameiurus sp*), mosquitofish (*Gambusia affinis*), sunfishes (*Lepomis sp*), largemouth bass (*Micropterus salmoides*) and American bullfrog (*Lithobates catesbeiana*). Potential suitable upland habitat for CTS (grasslands) and SCLTS (oak woodlands, northern coastal scrub, willow thickets) is lacking in the project vicinity, due to the decades long use of the uplands for agricultural uses, and what remains is highly fragmented and isolated. Furthermore, the nearest known breeding sites for both the CTS and SCLTS are approximately 2.3 and 2.4 miles NW of the project site, at Buena Vista Pond and Ellicott Pond, respectively. These distances are beyond that recorded for travel distances of both species, therefore, dispersal into the project area from these sites is not reasonable. CTS and SCLTS are not expected to be impacted by the proposed project and no further discussion is warranted.

California Red-legged Frog

The proposed trail alignment has the potential to result in direct and indirect impacts to red-legged frogs, as the alignment occurs in an area known to support this species (see Figure 8). Since CRF are capable of long distance movements, CRF can be expected to occur along the project alignment, as they disperse across the landscape, especially during periods of rainfall. Therefore, trenches and holes could entrap dispersing CRF; injury and/or mortalities could occur in staging and storage areas for materials and equipment, as individual seek cover under objects; and dispersal or migration patterns could be altered by silt-fencing around the project alignment.

RECOMMENDATIONS

At a minimum, the following customary protection measures should be incorporated into the project.

- Approval of a qualified biologist, preferably one that is permitted to handle CRF
- Identification of species relocation sites and development of a relocation plan, subject to agency approval
- Pre-construction surveys, generally within 48 hrs. of project start.
- Workers environmental training
- ESA fencing around the project area, including staging and storage sites

- Limited use of exclusion fencing, to be determined on a site specific basis. If needed, establish exclusion fencing in phases to avoid disruption of movement corridors
- Daily clearance monitoring, prior to the day's work by a qualified biologist
- Monitoring of vegetation removal and rough grading daily by a qualified biologist
- Contractor to create escape ramps for trenches and holes left uncovered overnight
- A qualified biologist should be available on standby for species relocation
- Seasonal restrictions, i.e., limited construction activities during the rainy season

It is anticipated that a FWS Biological Opinion (BO) would be developed for this project, due to the crossing of Struve Slough and likely involvement of the Army Corps of Engineers. A BO would include variations of the measures presented, including take limits. Therefore, the measures, above, are general in nature. If a BO is not acquired for this project, take is not allowed and the presence of CRF in the work area could result in agency consultations and project delays.

Please call me if you have any comments or questions regarding this report.

Sincerely,

Bryan Mori
Consulting Wildlife Biologist

Attachments: References; Appendix.

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Personal Communications:

Mark Allaback, Biosearch Environmental Consulting, Santa Cruz, CA.
Gary Kittleson, Kittleson Ecological Consulting, Live Oak, CA

Appendix: Records of CTS, SCLTS and CRLF in the Lee Road Trail Project vicinity, Santa Cruz County, California

SPECIES	NDDB OCCURRENCE NO.	DISTANCE FROM PROJECT (Miles)	COMMENTS
California Tiger Salamander	553	2.3	Buena Vista Pond, 0.3 mile SW of the intersection of Fiesta Way and Rancho Road, SW of Highway 1. Breeding pond for both CTS and SCLTS. Recently studied by Biosearch Environmental Consultants 2014-15.
	65	2.6	Breeding pond at the Santa Cruz long-toed Salamander Ecological Reserve. California red-legged frog are also present at this site. Recently studied by Biosearch 2014-15.
Santa Cruz Long-Toed Salamander	24	2.2	1 adult (?) collected on San Andreas Road south of Zils Rd and north of McQuaide Drive, 19 February 1968.
	22	2.3	Buena Vista Pond, 0.3 mile SW of the intersection of Fiesta Way and Rancho Road, SW of Highway 1. Same as occurrence no. 553, above.
	6	2.6	Breeding pond at the Santa Cruz long-toed Salamander Ecological Reserve. Same as occurrence no. 65, above.
California Red-legged Frog	287	0.0	West Branch Struve Slough from Harkins Slough Rd north to SR1. Adults observed in channelized slough during Harkins Slough Rd Bridge construction in 2004.
	287	0.0	Lee Road Struve Slough crossing. Adults observed on Lee Rd in 2004, during Harkins Slough Rd Bridge construction in 2004. Bullfrogs abundant.
	31	0.4	Adults observed at Hanson Slough in 1990.
	437	0.4	Struve Slough between Harkins Slough Rd and SR1. Adult and juvenile observed in 2001.
	NA	0.2	Three adults observed in Watsonville Slough channel, west of Lee Rd, 2006 (G. Kittleson, pers. comm.).
	327	0.8	Watsonville Slough restoration site on Santa Cruz Land Trust property; egg masses and tadpoles observed in 2015-16. Bullfrogs, carp and crayfish abundant. Also, breeding recorded at three seasonal ponds on the property; breeding inconsistent from 2013-16 (G. Kittleson pers. comm. B. Mori pers. obs.).
	326	1.0	SPRR crossing at Harkins Slough. One dead adult on tracks observed in 1999.
	1285	1.0	Adults and subadults observed along the Pajaro River, SE of the Lee Rd Trail project. Observations spanning 2004-2012.
	NA	1.0	Adults and subadults observed along the Pajaro River, SW of the Lee Rd Trail project. Observations spanning 2004-2012 (G. Kittleson, pers. comm.).

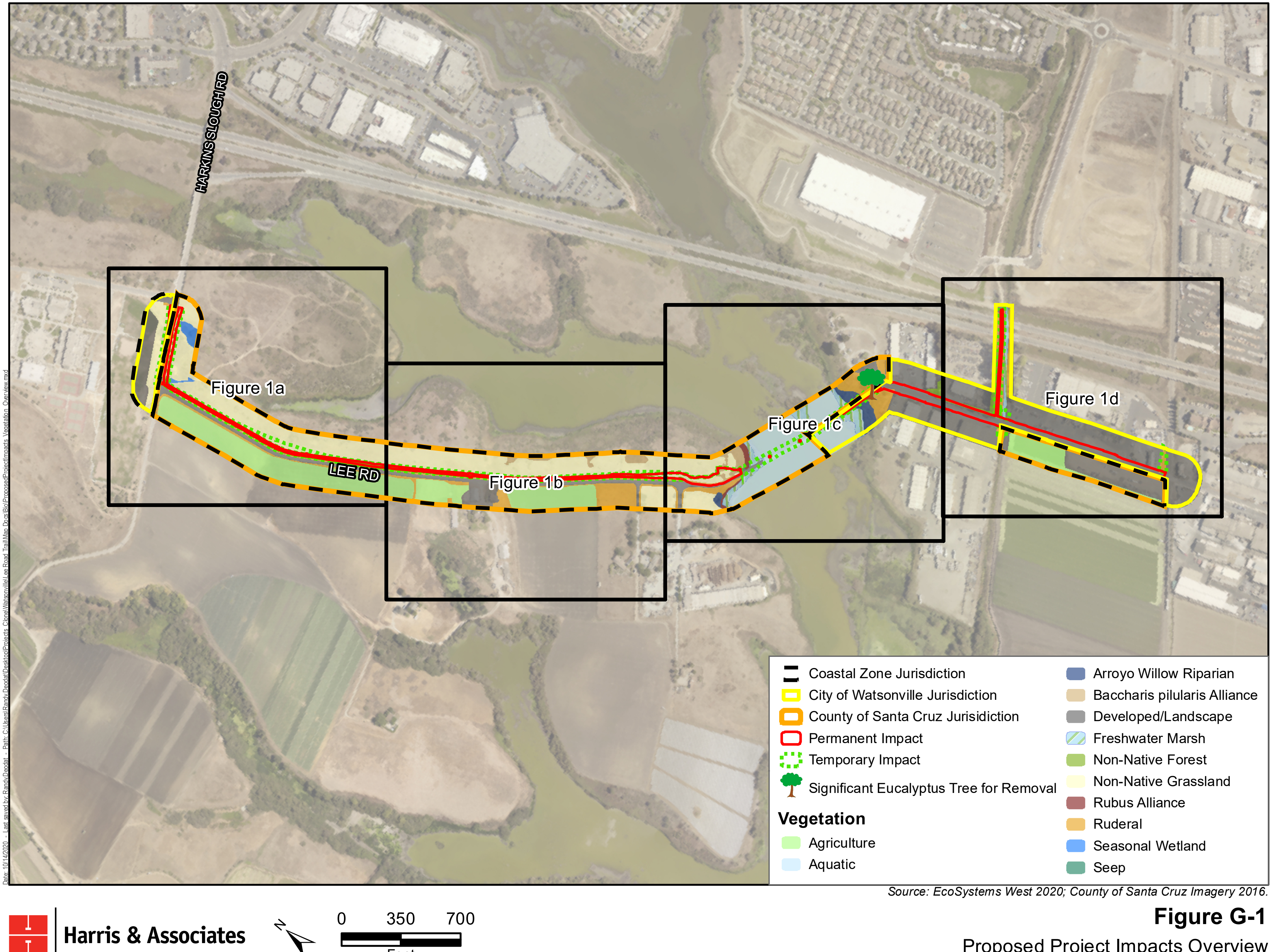
APPENDIX F. SAN FRANCISCO DUSKY-FOOTED WOODRAT RELOCATION PLAN

San Francisco Dusky-footed Woodrat Relocation Plan

San Francisco dusky-footed woodrat houses may be present within coastal scrub and riparian habitats within the Study Area.

- Prior to construction, a qualified biologist shall conduct a preconstruction survey for woodrat houses, and clearly flag all houses within the impact area and immediate surroundings.
- The construction contractor shall avoid woodrat houses to the extent feasible by installing a minimum 10-foot (preferably 25-foot) buffer with silt fencing or other material that shall prohibit encroachment. If this buffer and avoidance is not feasible, the qualified biologist shall allow encroachment into the buffer, but preserve microhabitat conditions such as shade, cover and adjacent food sources.
- If avoidance is not possible, a qualified biologist shall develop and implement a Woodrat Relocation Plan (Allaback 2016). The plan shall be developed in consultation with CDFW and shall include:
  - **Step 1. Live Trapping.** Trapping efforts shall not take place during low night temperatures (below 40 degrees Fahrenheit), inclement or extreme weather conditions. To reduce affects to vulnerable young during their breeding season, work shall be scheduled between August 1 and October 30.
  - **Step 2. Dismantling.** For occupied houses, the existing woodrat house shall be dismantled and the woody debris, including cached food and nesting material, carried to the nearest suitable relocation site outside the Project footprint and used to build an artificial shelter. If no San Francisco ducky-footed woodrats are captured at a given house, it shall be dismantled by hand to ground level, and the woody debris spread to reduce rebuilding.
  - **Step 3. Artificial Shelter Location and Installation.** Sites for artificial shelters shall be located in proximity to the original house location and no closer than 20 feet from existing woodrat houses and other artificial shelters. Choose the best available microhabitat, ideally in a location with sun and shade and if possible under the same species of tree or shrub as was present at the original house location. Relocation sites shall contain biologically-suitable habitat features (e.g. stands of poison oak, coast live oaks, and dense native brush).
  - **Step 4. Release of San Francisco Dusky-footed Woodrat.** The occupied live-trap shall be placed against the entrance to the artificial shelter, opened, and the woodrat allowed to enter, ideally on its own accord. After the individual enters, the entrance shall be loosely but completely plugged with dirt and leaf duff to encourage it to stay, at least for the short-term.
  - **Step 5. Monitoring.** Monitoring shall be conducted for 30 days after relocation is completed and include infrared and motion activated cameras and an occupancy assessment.
  - **Step 6. Safety Measures.** Human exposure to woodrats and possible diseases carried by woodrats shall be minimized.
  - **Step 5. Reporting.** A report on San Francisco dusky-footed woodrat nest monitoring shall be provided to CDFW within 30 days following the end of the monitoring period and shall include the methods and results of trapping and relocation, occupancy determinations, and discussion of any remedies that may be needed.

APPENDIX G. PROPOSED PROJECT (AND WEST SIDE OPTION B) MAP OF IMPACTS



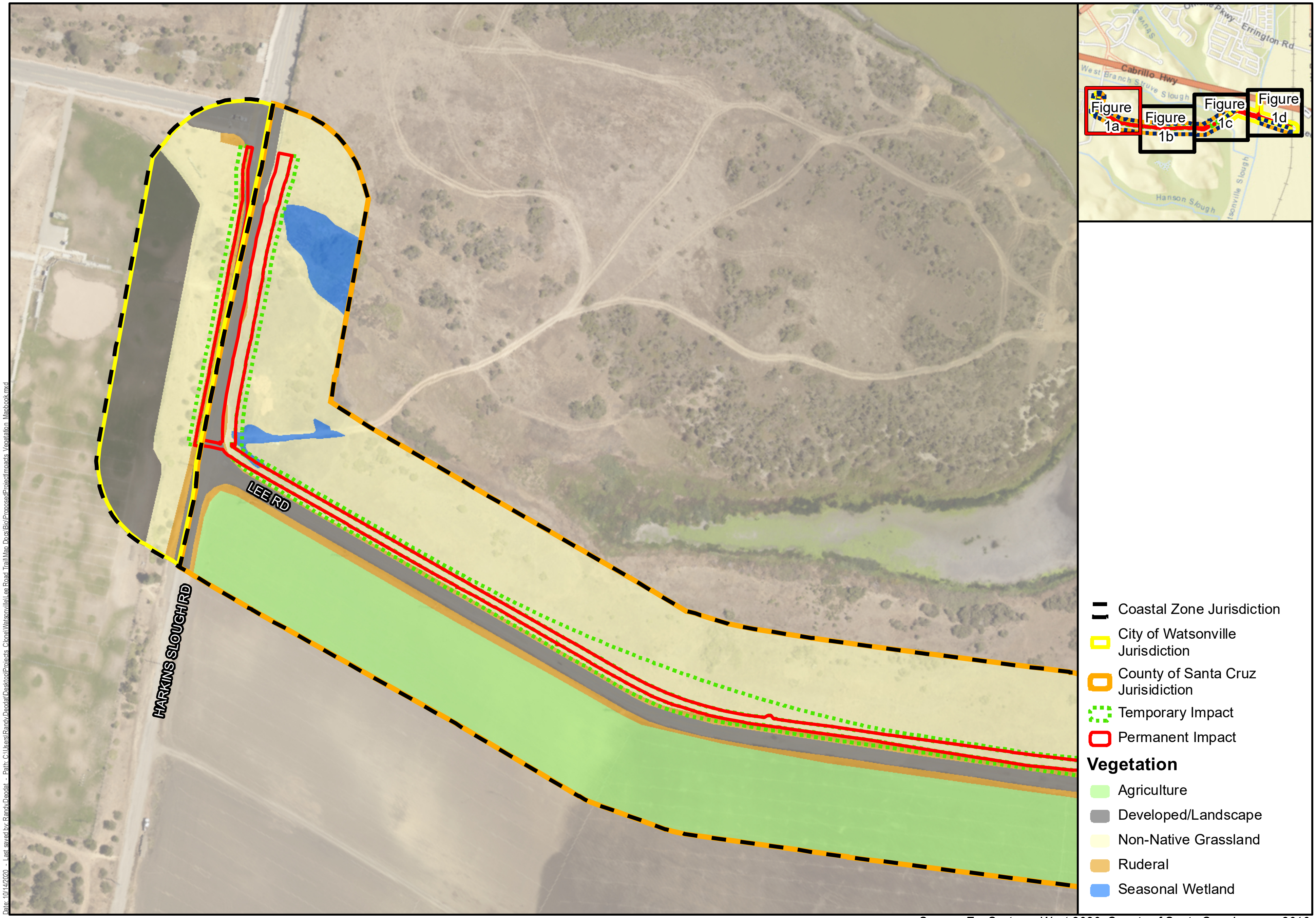
Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

Harris & Associates

Figure G-1

Proposed Project Impacts Overview

Watsonville Lee Road Trail Project



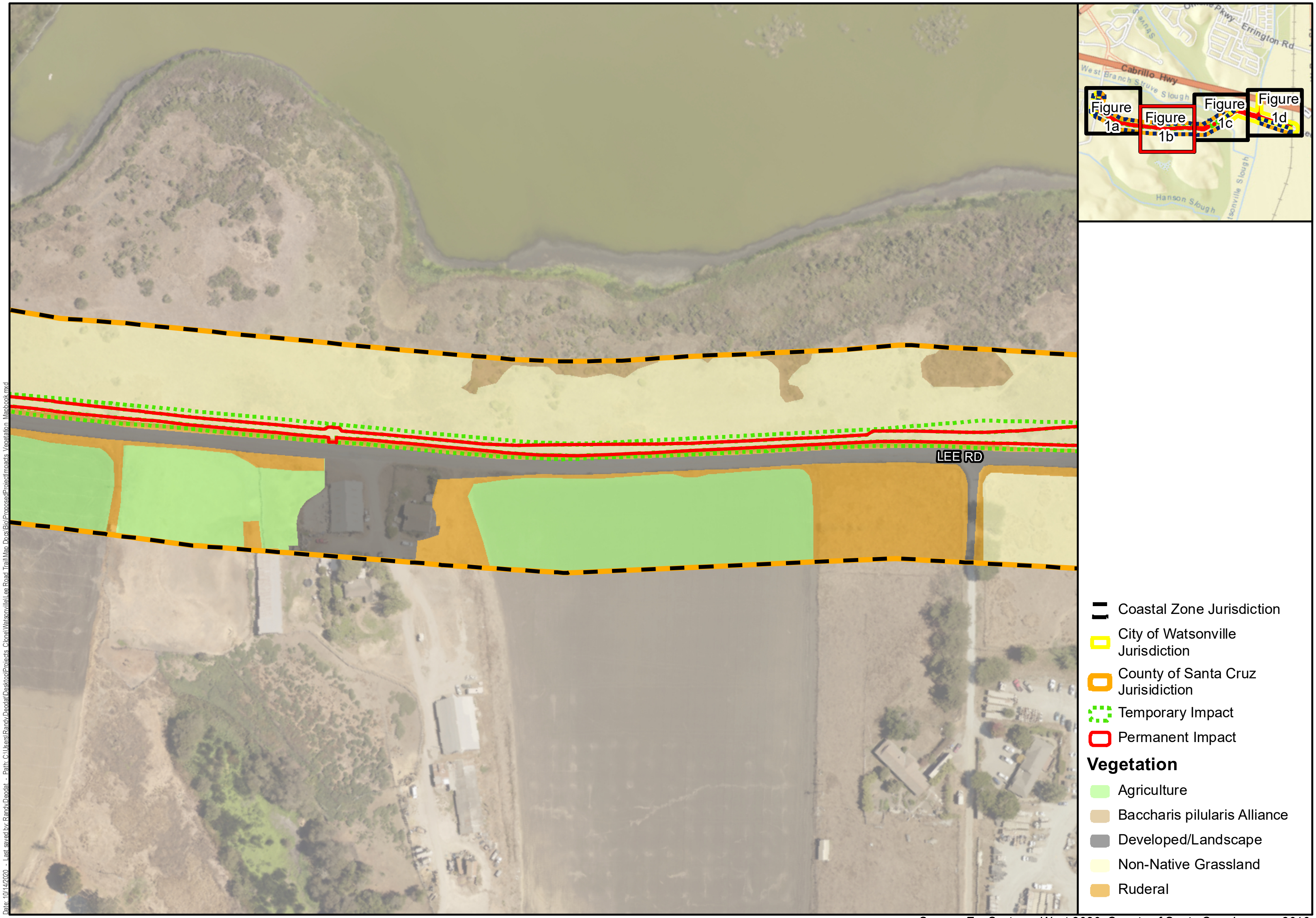
Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

Harris & Associates

Figure G-1a

Proposed Project Impacts

Watsonville Lee Road Trail Project



Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

Harris & Associates

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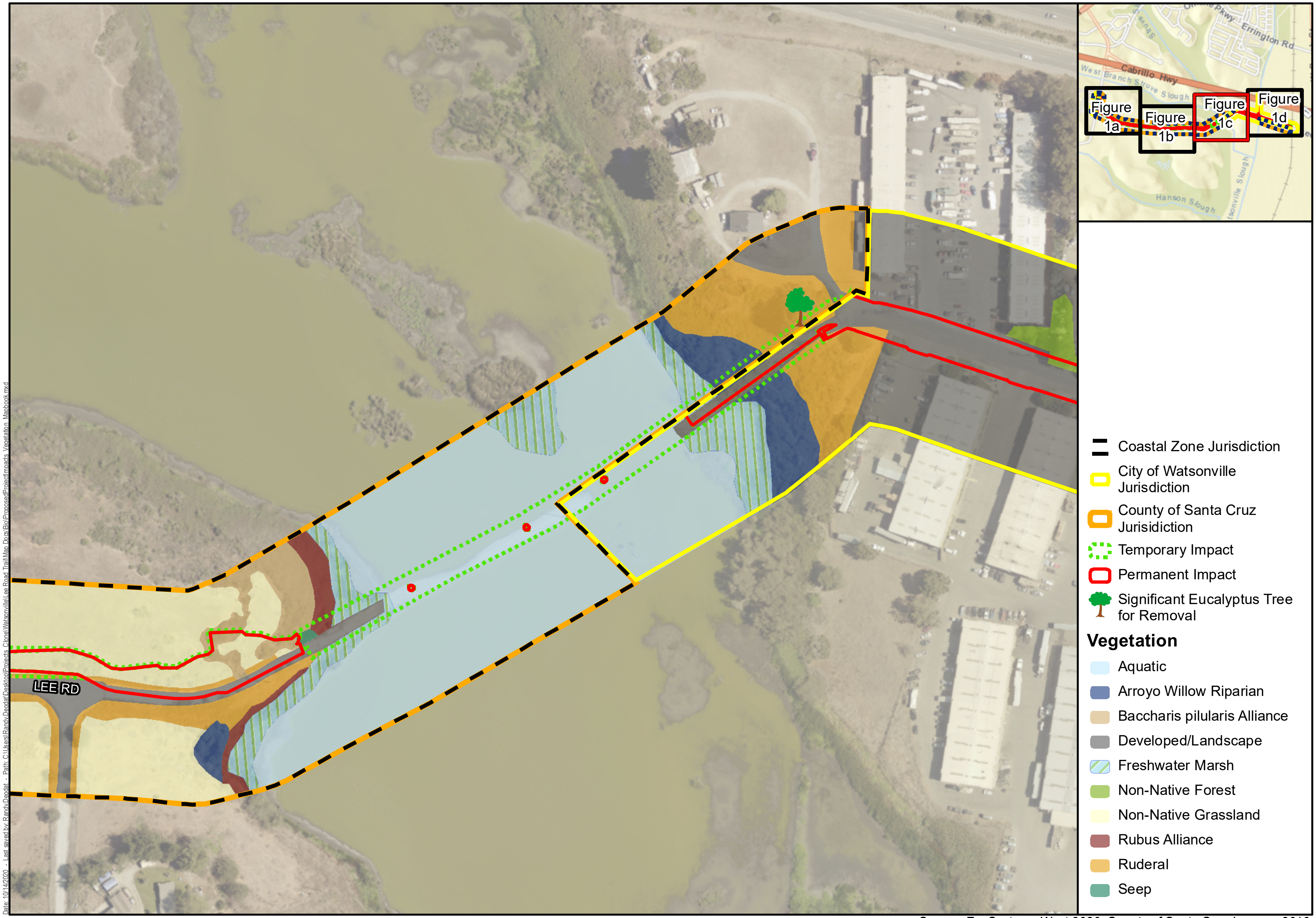
Feet

Figure G-1b

Proposed Project Impacts

Watsonville Lee Road Trail Project



Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

Harris & Associates

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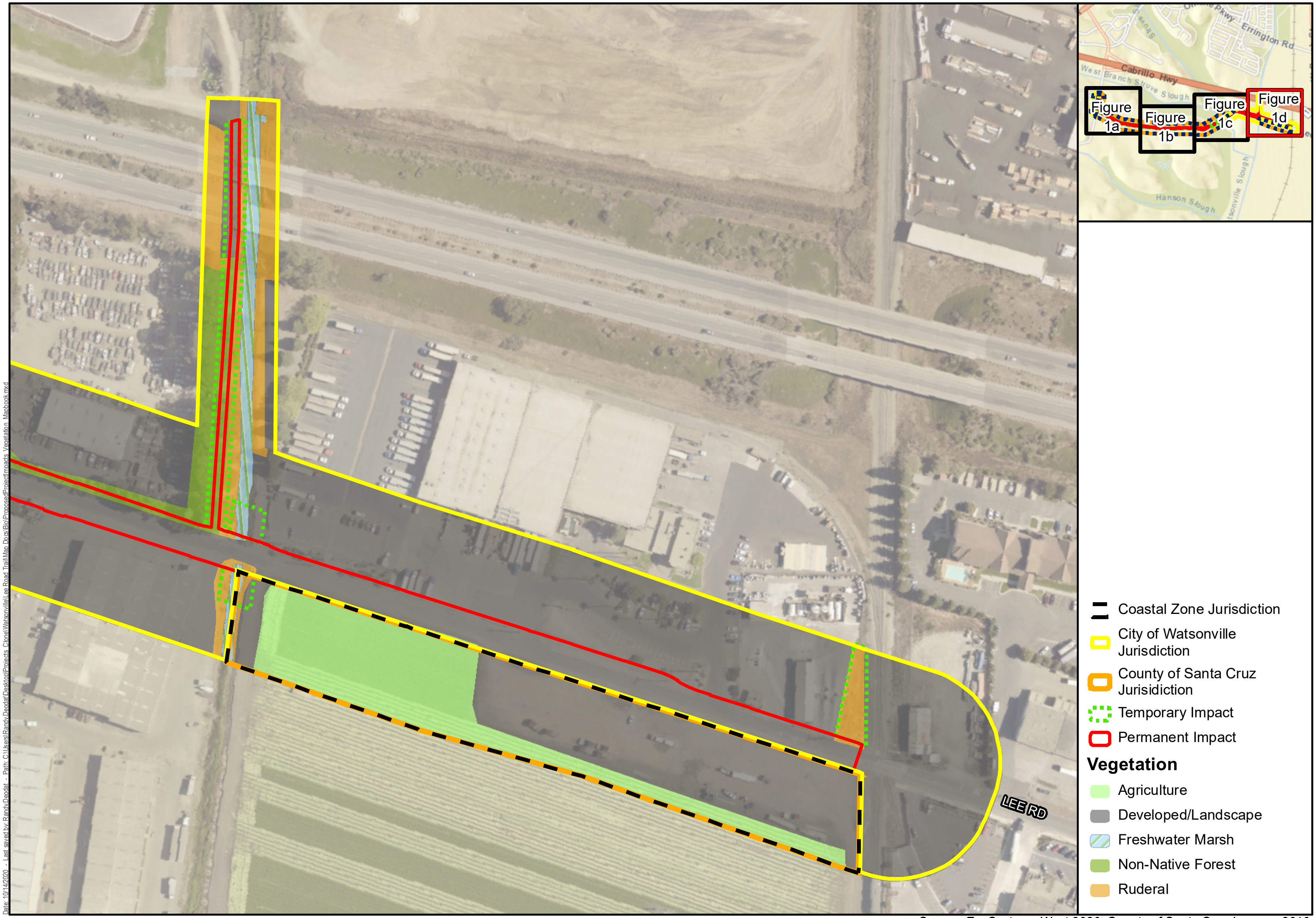
Feet

Figure G-1c

Proposed Project Impacts

Watsonville Lee Road Trail Project



Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

Harris & Associates

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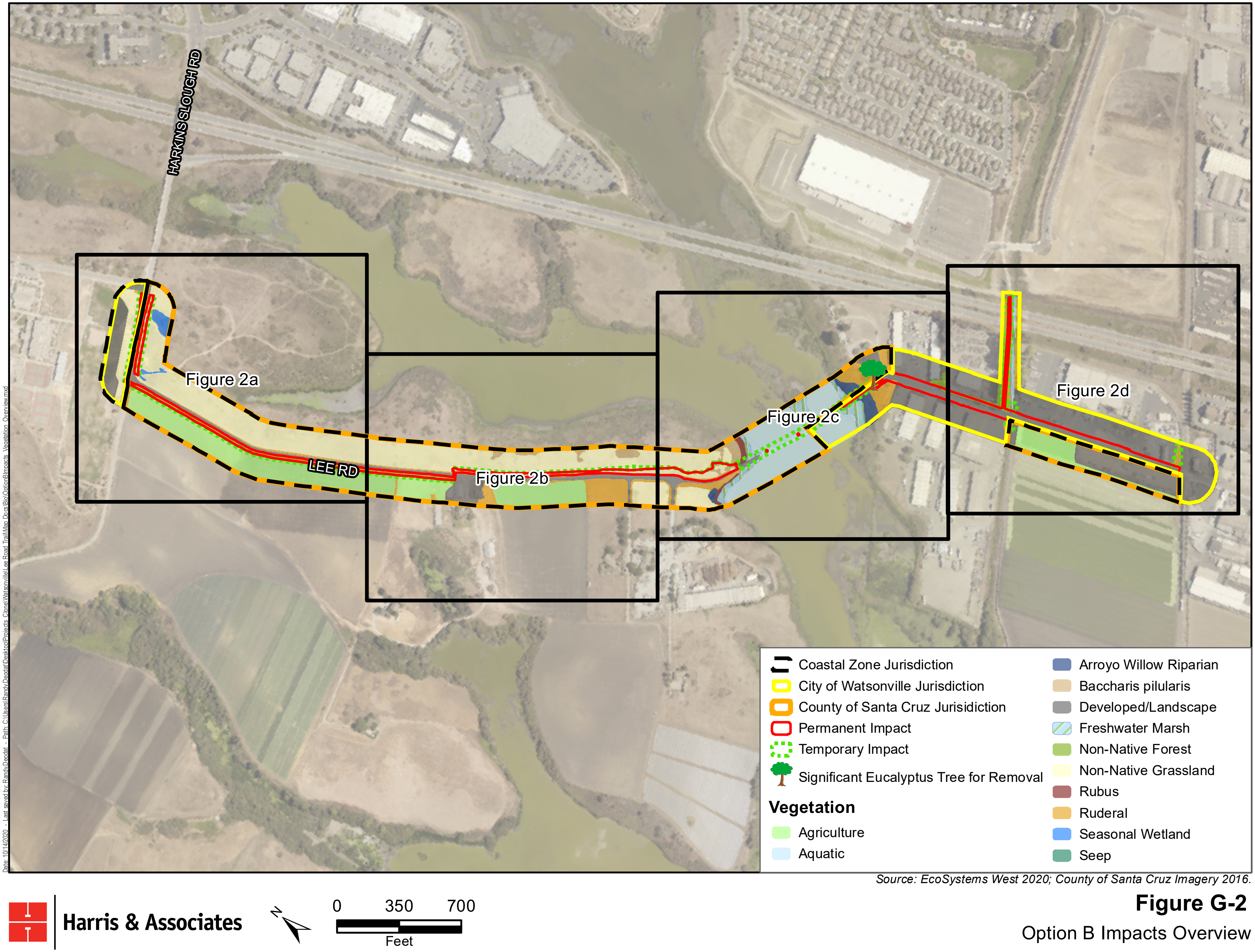
Figure G-1d

Proposed Project Impacts

Watsonville Lee Road Trail Project



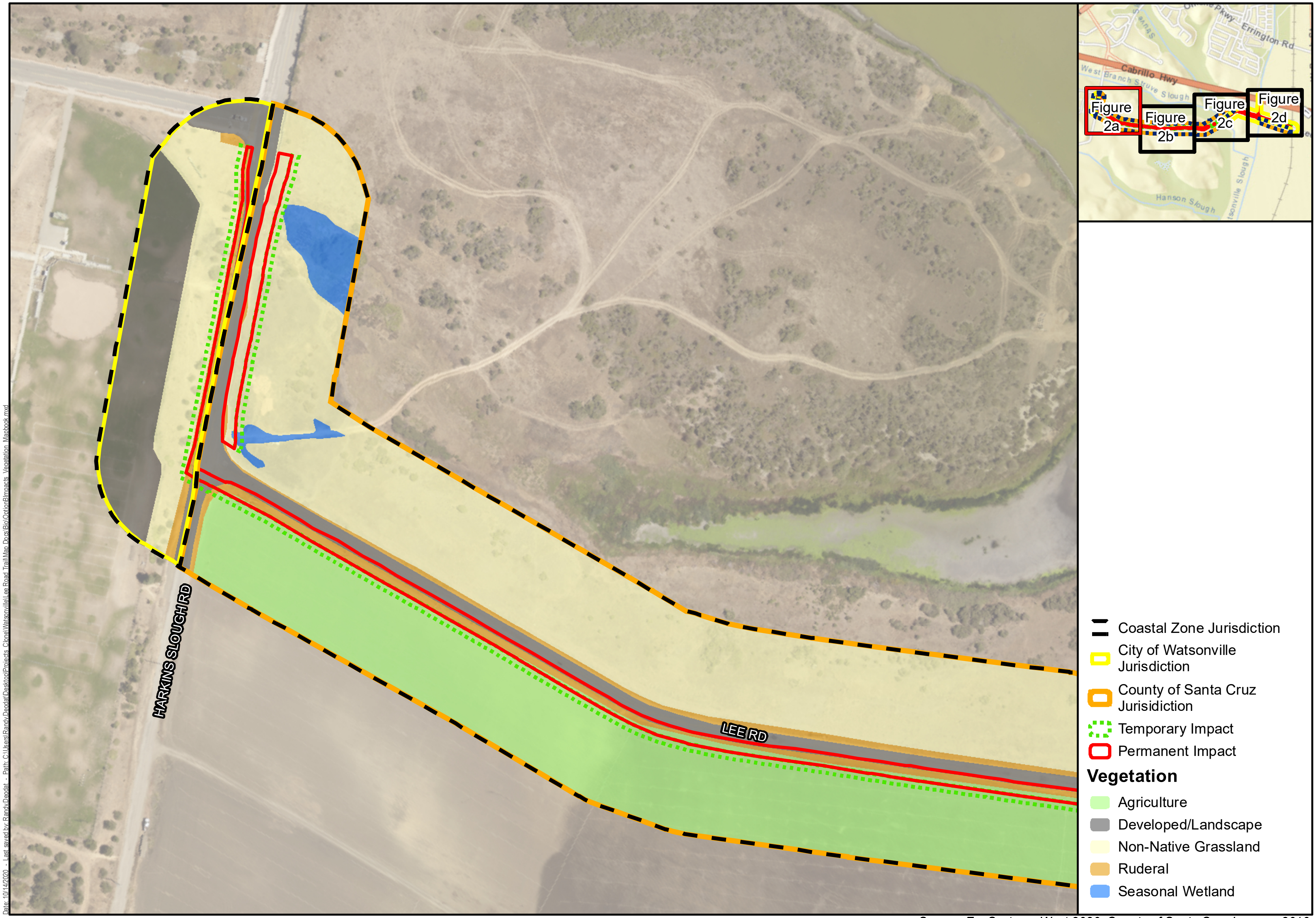
Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

Harris & Associates

Figure G-2

Option B Impacts Overview

Watsonville Lee Road Trail Project



Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

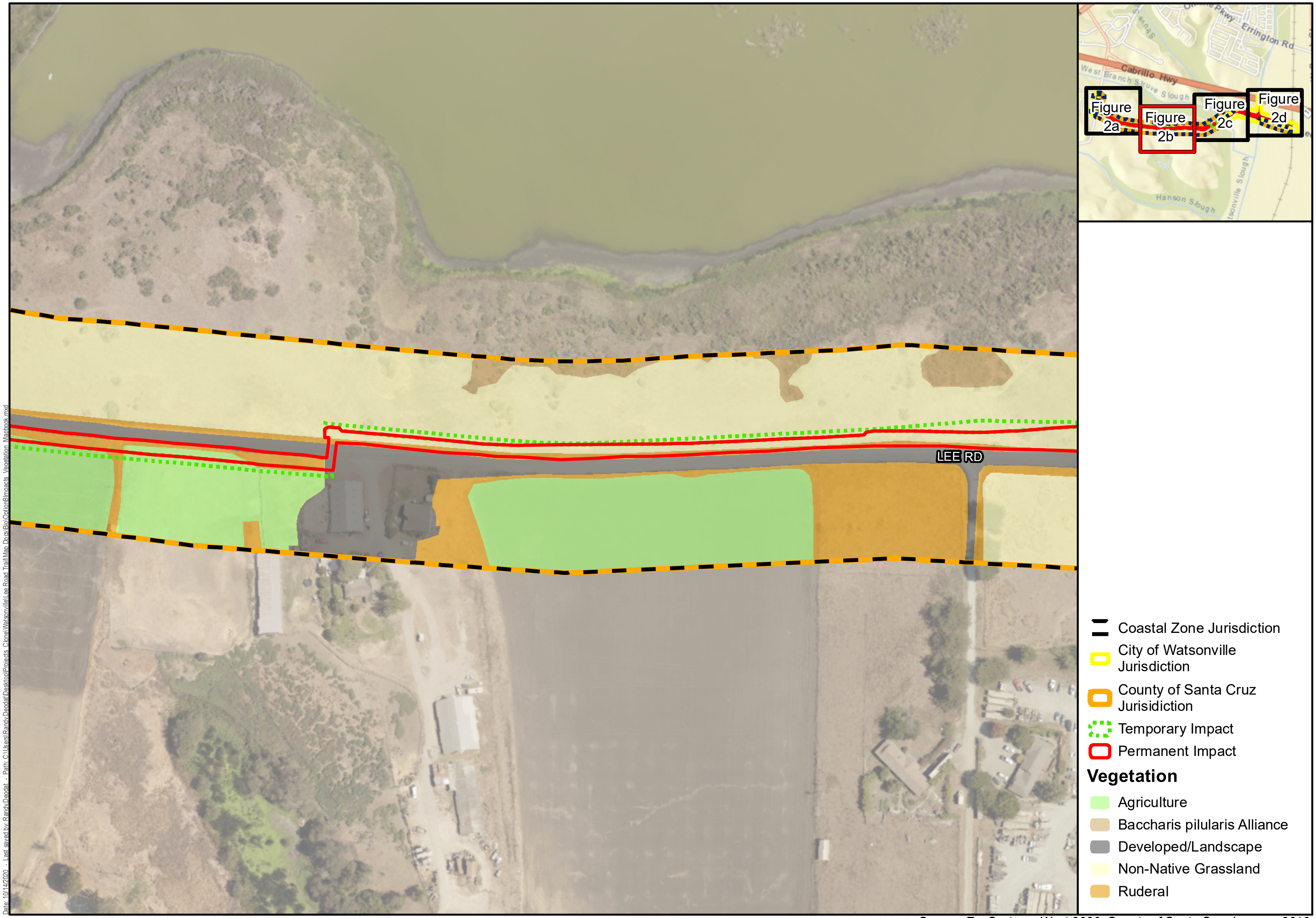
Harris & Associates

0 100 200
Feet

Figure G-2a

Option B Impacts

Watsonville Lee Road Trail Project



Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

Harris & Associates

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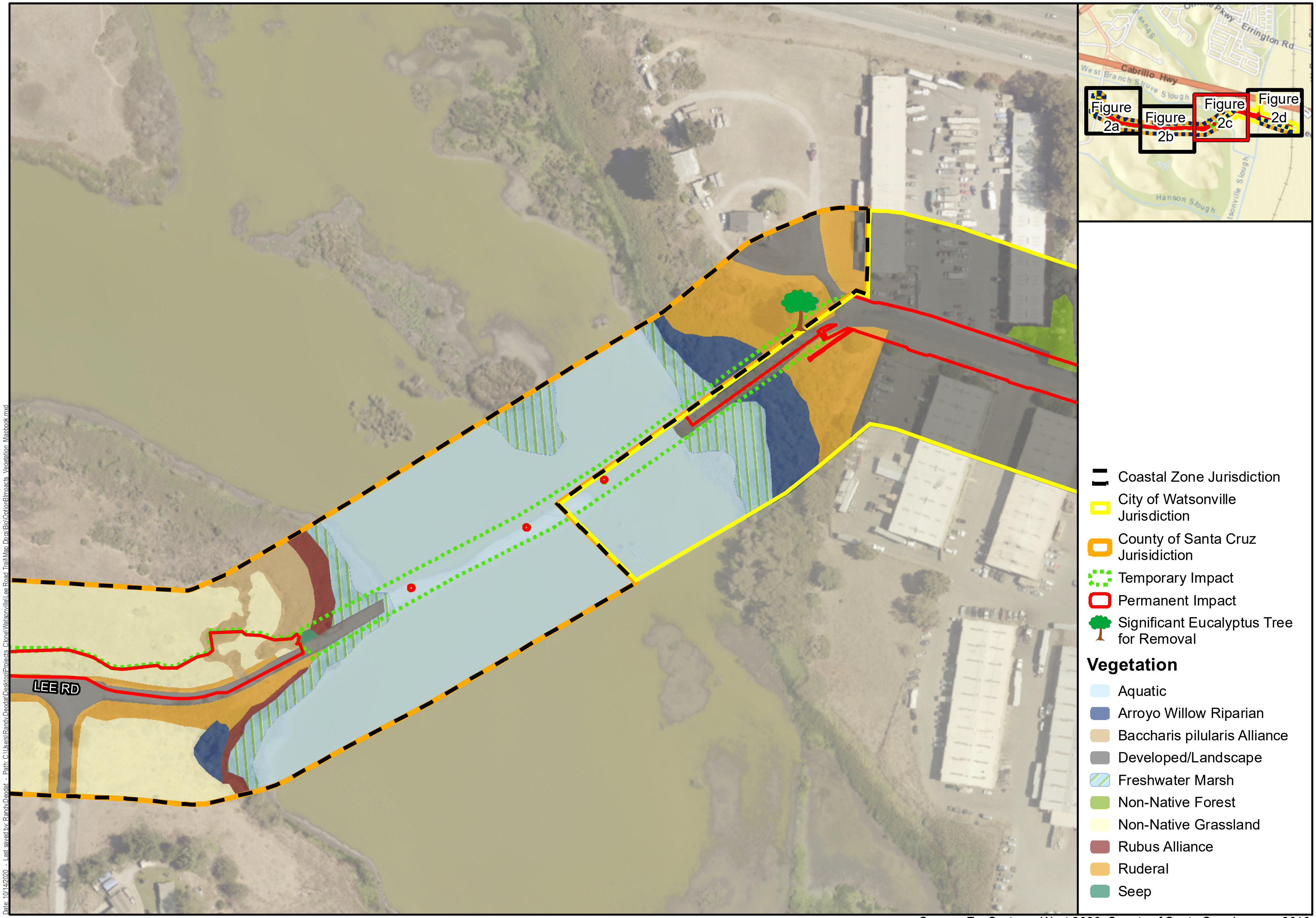
Figure G-2b

Option B Impacts

Watsonville Lee Road Trail Project



Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

Harris & Associates

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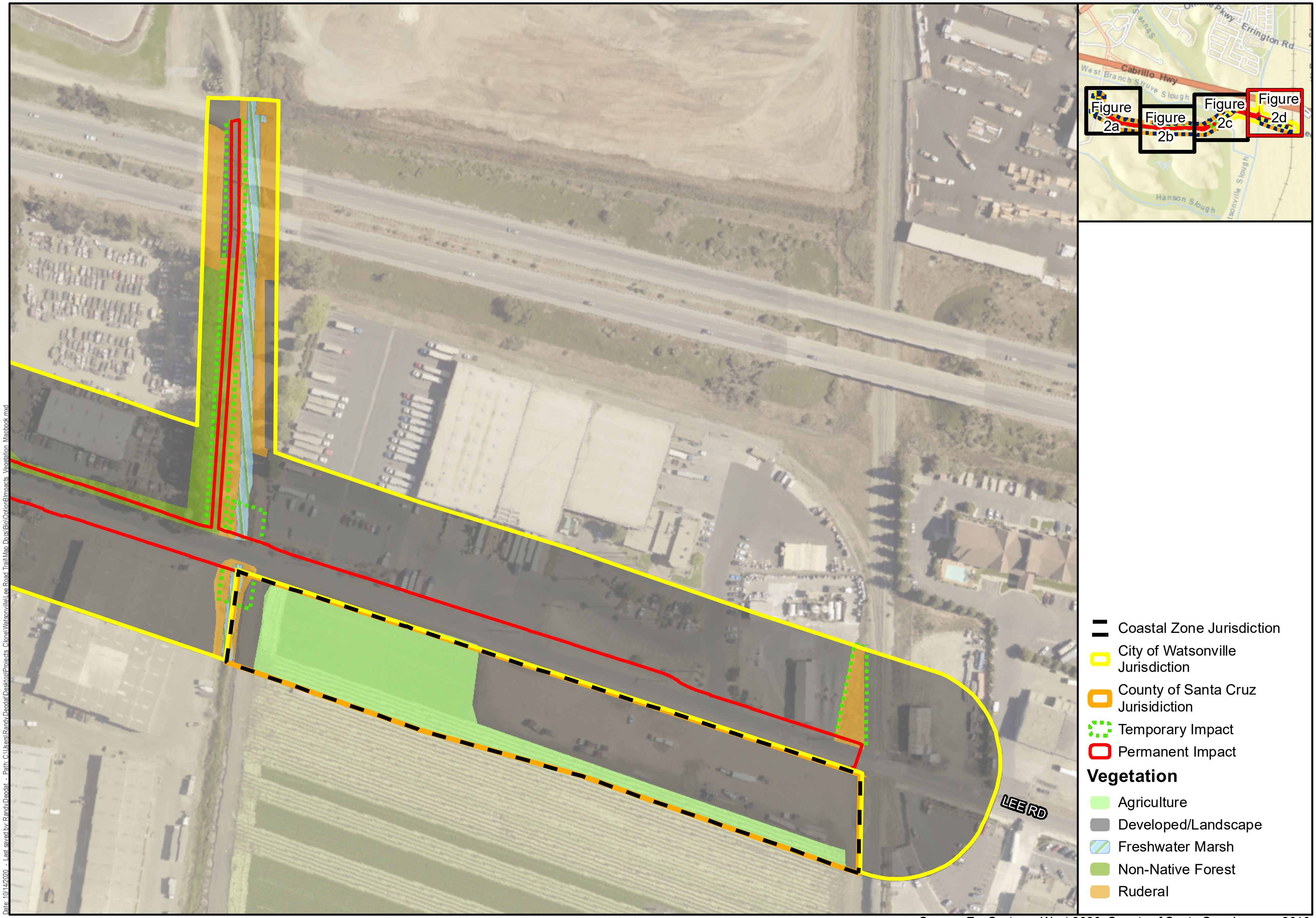
Feet

Figure G-2c

Option B Impacts

Watsonville Lee Road Trail Project



Source: EcoSystems West 2020; County of Santa Cruz Imagery 2016.

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Figure G-2d

Option B Impacts

Watsonville Lee Road Trail Project

APPENDIX H. WETLAND MITIGATION OPPORTUNITIES

Watsonville Wetlands Watch

P.O. Box 1239 • Freedom, CA 95019
www.watsonvillewetlandswatch.org

"Dedicated to protecting, restoring and appreciating the wetlands of the Pajaro Valley"

September 14, 2020

Justin Davilla
Ecosystems West Consulting Group
180 7th Avenue, Suite 201
Santa Cruz, CA, 95062

Dear Justin,

The following provides information related to wetland creation and enhancement opportunities within close proximity to the proposed impacts associated with the Lee Road Trail Project. These three concepts represent projects currently in design, or those consistent with recent planning efforts and occurring on lands owned by either the California Department of Fish and Wildlife, or the City of Watsonville.

This memorandum also includes recommendations for erosion control and soil-stabilization measures following any potential grading work associated with this project.

If you have any further questions, please don't hesitate to contact me.

Sincerely,

Jonathan Pilch
Executive Director
Watsonville Wetlands Watch

Overview of Wetland Creation Opportunities Adjacent to the Proposed Impacts to Wetland Associated with the Lee Road Connector Trail

Target wetland creation work within the vicinity of the Lee Road Trail Project Area should expand existing wetland features to improve existing function and values (e.g. improved water quality, enhanced wildlife habitat), or create new wetland areas that provide similar benefits to the Watsonville Sloughs system. These objectives can be achieved through the creation of off-channel seasonal wetland depressions and swales where the populations of bull frogs and non-native centrarchid fish, such as bass and carp, are unlikely or unable to establish and successfully reproduce. Due to high levels of disturbance associated with past farming activities, there is ample opportunity within the West Struve Slough and Hanson Slough watersheds to create additional wetland habitat. Wetland creation also includes opportunities for enhancement and restoration of adjacent upland habitats. The wetland mitigation program should incorporate management of invasive weeds and establishment of native habitat adjacent to the wetlands so as to improve overall wetland habitat quality.

The following potential mitigation measures have been identified as long-term goals in previously completed or in-process habitat planning efforts, including the Watsonville Slough System Conservation and Enhancement Plan, habitat management planning documents produced for the California Department of Fish and Wildlife for the Watsonville Sloughs Ecological Reserve, and the Biological Restoration Plan for the Environmentally Sensitive Habitat Areas (ESHAs) of Pajaro Valley High School as well as the currently in-process, long-term management plan for that property.

There are additional wetland creation and habitat enhancement areas within the general project area, such within the Watsonville Slough corridor on either side of Lee Road. The following three projects, however, occur on currently protected State or City lands, and therefore are more feasible than projects that would require easements, fee-title purchase or other land protection agreements.

Figure 1.

Wetland Restoration/Creation Opportunities
West Struve Slough and Upper Hanson Slough

WETLAND CREATION OPPORTUNITIES

West Struve Slough Wetland Restoration Site 1, CA DFW property.

The best wetland creation opportunity on the CDFW property, West Struve Slough Unit, is located on the east side of the property as shown in Figure 1 above. It is feasible to create a seasonal wetland that is outside of the main slough channel, where ground water would be sufficient to support seasonal wetlands. A total of approximately up to 0.1 - 0.2 acres appears to be the optimal size of wetland creation for this location. Further field investigation is needed to establish the orientation and hydrologic capacity for this feature. A smaller wetland creation or enhancement project could be developed in this location as well. Concurrent wetland enhancement work would include removal of invasive plants in the adjacent surrounding area and establishment of high-quality native upland habitat.

West Struve Slough Wetland Restoration Site 2, Pajaro Valley High School ESHAs, City of Watsonville Property.

Wetland creation and enhancement opportunities within this area have been identified as a part of the long-term management plan for this property, which is currently in process. Evaluation and design work to date has included: 1) establishment of ground-water monitoring stations and surface water monitoring stations, which were established during the Watsonville Slough System Hydrologic Study; and 2) conceptual construction design completed by Waterways Engineering in consultation with Watsonville Wetlands Watch and Kittleson Environmental Consulting. Wetland creation and enhancement work would entail lowering the elevation of areas adjacent to the West Struve Slough channel so as to create additional seasonal ponding and enhance wetland and native plant communities. There is ample room to create and enhance wetland habitat in this area and accommodate both small and larger scale wetland restoration and enhancement efforts. Wetland enhancement work should be done concurrently with the creation work and would entail invasive plant removal and restoration of native habitat.

Hanson Slough Wetland Restoration Site 3, Pajaro Valley High School ESHAs, City of Watsonville Property.

Wetland creation and enhancement opportunities within this area include deepening of a seasonal wetland depression that was made during the establishment of the Hanson Slough ESHA in 2004, when this property was converted from agricultural lands to protected open space. Some limited wetland enhancement work was performed as a part of the Biological Restoration Plan for the Pajaro Valley High School that included impounding of a low-lying area to improve wetland characteristics downstream of one of the seasonal springs that feeds Hanson Slough. Seasonal wetland creation in this area would create deeper areas that would remain ponded longer, enhancing habitat values for wildlife. A conceptual design for this area has been created by Waterways Engineering, Watsonville Wetlands Watch, and Kittleson Environmental Consulting as a part of the long-term management plan for this property. A biological assessment has been drafted that addresses wetland enhancement work and a planned foot-bridge crossing for high school students to use for wetland study. Up to 0.25 acres of wetland enhancement work could be accommodated with any smaller acreage available. Although this site would not create new wetlands, the increased hydroperiod is expected to significantly enhance wildlife habitat and allow for establishment of persistent riparian vegetation that could offset temporary and permanent impacts to ESHA habitats associated with the proposed Lee Road Trail.

Vegetation Management Associated with the Lee Road Trail

All areas within the limits of grading and where soil is disturbed during Lee Road Trail construction should incorporate native revegetation and management including approaches that reduce the potential for erosion and lead to the long-term enhancement of site conditions. All bare ground associated with this work should be seeded with a native seed mixture that is site-specific to the Watsonville Slough System. Depending on the quantities needed, sufficient native seed is likely locally available either by onsite collection or procurement from local nurseries.

Container plantings may be utilized in select areas, especially along sloped areas. A typical erosion control and habitat enhancement seed list for this project would incorporate the following:

Table 1. Upland erosion control and habitat enhancement seed mix.

Species	**Common Name**	**Direct Sowing Lbs/Acre (PLS)**	**Hydroseeding LBS/Acre (PLS)**
Achillea mellifolium	Yarrow	0.50	1
Bromus carinatus	California brome	2.00	3
Chloragulum pommeridiadum	Soap root	0.50	0.5
Danthonia californica	California oatgrass	0.25	0.25
Elymus glaucus	Blue wildrye	10.00	15
Eschscholzia californica	CA poppy	0.50	1
Jucnus patens	Spreading rush	0.25	0.5
Horkelia cuneata	Wavy-leafed horkelia	2.50	0.25
Hordeum bracyantherum	Meadow barley	8.00	15
Stipa pulchra	Purple needle grass	11.00	15
Sisyrinchium bellum	Blue eyed grass	1.00	2
Total		36.50	53.50

Attachment E

Jurisdictional Aquatic Resources Delineation
(May 2020)

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DELINEATION OF AQUATIC RESOURCES SUBJECT TO STATE AND FEDERAL JURISDICTION FOR THE LEE ROAD TRAIL PROJECT AREA WATSONVILLE, SANTA CRUZ COUNTY, CALIFORNIA

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1 INTRODUCTION

The Lee Road Trail Project Area (Project Area) covers approximately 54.2-acres of property on and immediately adjacent to Harkins Slough Road and Lee Road in the City of Watsonville and unincorporated Santa Cruz County, California. The Project Area is bounded approximately by Harkins Slough Road to the north, cultivated and fallow agricultural lands to the west, West Struve Slough and the CDFW Watsonville Slough Ecological Reserve to the east, and light industrial businesses and the Santa Cruz County Regional Transportation Commission rail corridor to the south (**Figure 1**).

On July 1- 2 and August 19, 2019, staff senior ecologist Justin Davilla of Ecosystems West Consulting Group conducted a routine wetland delineation of the Project Area to determine the extent of potential wetlands and waters subject to jurisdiction under Sections 401 and 404 of the Clean Water Act, the Porter Cologne Water Quality Act, and the California Coastal Act. This report presents the results of this delineation.

1.1 Project Background

The purpose of the project is to:

- implement the City's Trails & Bicycle Master Plan;
- provide safe bicycle/pedestrian access to Pajaro Valley High School from the south, where there currently is no through access due to the submerged portion of Lee Road; and
- provide a connection to planned trails in the City and unincorporated lands, including the Land Trust of Santa Cruz County's Watsonville Slough Farm trail west of Lee Road, the Manabe-Ow Trail and Lower Watsonville Slough Trail east of Highway 1, and the Monterey Bay Sanctuary Scenic Trail Network (MBSST Rail Trail) at the south end of the project.

1.2 Project Description

The City is proposing the new construction of the Lee Road Trail Project (project). The 1.43-mile-long trail would generally be a 12-foot-wide pedestrian/bicycle trail along the east (inland) side of Lee Road, with a 12-foot-wide pedestrian/bicycle bridge over the portion of Lee Road extending through (and submerged by) Struve Slough. Additionally, portions of the trail would extend along Harkins Slough Road on the northwest end and along the unpaved path located on the north side of Watsonville Slough. South of Watsonville Slough, the trail would continue along the west (coastal) side of Lee Road to the railroad crossing at the southeast end.

1.3 Driving Directions to the Lee Road Trail Project Area

The proposed Project is located in Watsonville, California southwest of Highway 1, and extending along Lee Road from Harkins Slough Road adjacent to Pajaro Valley High School to the north to the proposed Santa Cruz County RTC rail-trail near Beach Street in the south. Due to the now submerged portion of Lee Road withing Struve Slough, the project is currently accessed from both the north and south.

To access the northern segment of the Project Area from California State Route 1 (Hwy 1), exit Main Street and turn south onto Green Valley Road. Approaching the Hwy 1 overpass, this road becomes Harkins Slough Road. Turn south onto Lee Road which intersects Harkins Slough Road just past Pajaro Valley High School. Proceed on Lee Road until the locked gate which prevents driving access to Struve Slough.

For the southern segment of the proposed Lee Road Trail, exit Hwy 1 at Riverside Drive/Hwy 129 and turn west. At the intersection with Lee Road, head north proceeding through West Beach Street Intersection until the locked gate preventing driving access into Struve Slough.

Figure 1.

Lee Road Trail Project Area
Watsonville, California

0 0.5 1 2 Miles

1 inch = 1 mile

N W E S

ECOSYSTEMS WEST CONSULTING GROUP

2 Regulatory Setting

2.1 *Section 404 of the Clean Water Act*

Section 404 of the Clean Water Act gives the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) regulatory and permitting authority regarding the discharge of dredged or fills material into “navigable waters of the United States.” Section 502(7) of the Clean Water Act defines navigable waters as “waters of the United States, including territorial seas.” Section 328 of Chapter 33 in the Code of Federal Regulations defines the term “waters of the United States” as it applies to the jurisdictional limits of the authority of the Corps under the Clean Water Act. A summary of this definition of “waters of the U.S.” in 33 CFR 328.3 includes:

(1) waters used in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(2) interstate waters and wetlands;
(3) “other waters” such as lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    i. used by interstate or foreign travelers for recreational or other purposes; or
    ii. from which fish or shellfish are taken and sold in interstate or foreign commerce; or
    iii. Which are for industrial purpose by industries in interstate commerce;
(4) impoundments of waters otherwise defined as waters of the United States;
(5) tributaries of other waters;
(6) the territorial seas;
(7) wetlands adjacent to waters.

Therefore, for the purpose of determining Corps jurisdiction under the Clean Water Act, “navigable waters” as defined in the Clean Water Act are the same as “waters of the U.S.” defined in the Code of Federal Regulations above.

The limits of Corps jurisdiction under Section 404 as given in 33 CFR Section 328.4 are as follows:

(a) *Territorial seas:* three nautical miles in a seaward direction from the baseline;
(b) *Tidal waters of the U.S.:*
    i. extending up to the high tide line or
    ii. up to the limit of adjacent non-tidal waters;
(c) *Non-tidal waters of the U.S.:* ordinary high-water mark or limit of adjacent wetlands;
(d) *Wetlands:* to the limit of the wetland.

Section 328.3 of the Federal Code of Regulations defines wetlands as:

> *"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*

The delineation study determined the presence or absence of wetland indicators used by the Corps in making a jurisdictional determination. The three criteria used to delineate wetlands are the presence of: (1) hydrophytic (water-loving) vegetation, (2) hydric soils, and (3) wetland hydrology. According to the Corps Manual, evidence of at least one positive wetland indicator from each parameter must be found in order to make a positive determination.

2.2 *Section 401 of the Clean Water Act*

Section 401 of the CWA requires that any activities licensed or permitted under Section 404 which may result in discharges into "navigable Waters of the U.S." meet state water quality standards. In California, Section 401 certification is the responsibility of the State Water Resource Control Board (SWRCB) and nine statewide Regional Water Quality Control Boards (RWQCBs) pursuant to California Water Code Section 13160 and to California Code of Regulations Title 23, Sections 3830-3869. A Section 401 water quality certification ensures the project appropriately controls or mitigates for any adverse impacts to effluent water that may reduce water quality below state and federal standards.

2.3 *California Department of Fish and Wildlife*

Jurisdictional authority of the California Department of Fish and Wildlife over relatively permanent bodies of standing or flowing water is established under Sections 1600-1616 or the Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream. The Fish and Game Code stipulates that it is unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any lake, river, or stream without notifying CDFW, proposing mitigation, and if determined to be necessary by the Department, entering into a Lake and Streambed Alteration Agreement (LSAA). The lateral extent of the watercourse is defined by CDFW as the top of the bank represented by the physical break in slope or the outward extent of the contiguous riparian canopy for trees rooted below the top of bank, whichever is greater.

The Wetlands Resources Policy of the CDFW states that the Fish and Game Commission strongly discourages development in, or conversion of wetlands, unless at a minimum, project mitigation assures that there will be "no net loss" of either wetland habitat values or acreage. The CDFW is also responsible for commenting on projects requiring ACOE permits under the Fish and Wildlife Coordination Act of 1958.

2.4 *California Coastal Act and Santa Cruz County Local Coastal Program*

The California Coastal Act of 1976 (CCA) gives authority to the California Coastal Commission or local governments with a certified Local Coastal Program (LCP) to authorize Coastal Development permits within the Coastal Zone. The Coastal Zone generally extends from 1,000 feet from the mean tide line. However, in undeveloped areas the Coastal Zone can be up to five miles inland, and in more urbanized areas it is often substantially less. The CCA also establishes specific uses for wetlands for which activities such as filling, diking or dredging may be allowed in wetlands within the Coastal Zone. It also provides additional review and approvals for specific actions within other "Environmentally Sensitive Habitat Areas" (ESHAs) and directs cities and/or counties within the Coastal Zone to develop an Local Coastal Program (LCP) for Coastal Commission certification.

Section 30121 of the California Coastal Act defines wetlands as:

> *"[L]ands within the coastal zone which may be covered periodically or permanently with shallow water and includes saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens."*

The Coastal Commission adheres to a "one-parameter definition" that only requires evidence of a single parameter (i.e. hydrophytic vegetation, hydric soils, or wetland hydrology) to establish the presence of wetland conditions. This definition is broadly outlined under Title 14 of the California Code of Regulations as follows:

> *"Wetland shall be defined as land where the water table is at, near or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent of drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats."*
>
> (14 CCR 13557)

The Santa Cruz County LCP prohibits non-resource dependent activities within coastal wetlands. Where there is no feasible less environmentally damaging alternative, and where feasible mitigation measure have been provided to minimize adverse impacts, Coastal Act Section 30233 permits the following uses within wetlands: (1) new or expanded coastal dependent industries (commercial fishing facilities, ports, energy facilities, etc.); (2) maintaining existing navigational channels, turning basins and mooring areas; (3) maintaining boating areas in service facilities in existing wetlands provided a substantial portion of any dredged wetland is restored and maintained as a biologically productive resource; (4) new or expanded boating facilities in open coastal waters; (5) incidental public services such as burying cables or pipes, and inspection of piers and intake/outfall lines; (6) mineral extraction including sand for beach nourishment; (7) restoration purposes; and (8) nature studies, aquaculture or other similar resource-dependent activities.

The City of Watsonville General Plan (1994) and LCP generally protect biological resources through Wildlife Habitat Protection and Water Quality Protection Sections of the General Plan and identification of Environmentally Sensitive Habitat Areas (ESHA) in Appendix B the LCP.

3 METHODS

Prior to conducting field surveys, available reference materials were reviewed, including the 1980 Soil Survey of Santa Cruz County (USDA, Soil Conservation Service (SCS)/Natural Resources Conservation Service (NRCS)), USFW National Wetland Inventory Maps, USGS National Hydrography Dataset, the Watsonville West USGS 7.5' quadrangle map, and available current and historical aerial photographs of the site. A focused evaluation of indicators of wetlands and waters was performed in the Project Area on 1 and 2 July and 19 August 2019. Subsequent site visits have been made to the site in late 2019 and early 2020 to determine the extent of surface and subsurface wetland hydrology as well as dynamic interannual shifts in annual plant assemblages in response to variable seasonal rainfall amounts and patterns. The methods used in this study to delineate jurisdictional wetlands and waters are based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual:*

Arid West Region (Version 2.0) (Arid West Supplement 2008). The routine method for wetland delineation described in the Corps Manual and WMVC Supplement was used to identify areas potentially subject to Corps Section 404 jurisdiction within the Project Area. Because the Project Area is located within the Coastal Zone, the site was evaluated carefully for the presence of each parameter due the requirement that only one of three (vegetation, hydrology, or hydric soils) is necessary to facilitate a positive wetland determination. A general description of the Project Area, including plant communities present, topography and current and historical land use practices was also produced during the delineation visit. The methods for evaluating the presence of wetlands and other waters of the U.S. employed during the site visit are described in detail below.

3.1 Potential Section 404 Wetlands

Data on vegetation, hydrology, and soils collected at sample points during the delineation site visit were recorded on standard Corps wetland determination data forms for the Arid West Region. In general, sample points for this delineation were selected based on relatively homogeneous plots approximately 100 square-feet in area. Once an area was determined to be a potential jurisdictional wetland, its boundaries were mapped using resource grade GPS equipment (Trimble GeoExplorer XH) and overlaid on a high resolution, orthorectified aerial photo. The acreage of potential jurisdictional wetlands was calculated using ArcGIS software. Wetland indicators described in the Corps Manual and WMVC Regional Supplement that were used to make wetland determinations at each sample point in the Project Area are summarized below.

Vegetation

Plant species identified on the property were assigned a wetland indicator status according to the U.S. Fish and Wildlife Service list of plant species that occur in wetlands (Lichvar 2016). This wetland classification system is based on the expected frequency of occurrence in wetlands as shown in **Table 1.**

Plant species with an indicator status of OBL, FACW, and/or FAC are classified as hydrophytic vegetation according to methodology outlined in the Corps Manual. For the WMVC Supplement, plus (+) and minus (–) modifiers of these classifications are not used. For example, plants previously identified in Reed (1986) as FAC–, FAC, and FAC+ are all considered FAC under the WMVC Supplement.

Table 1. Wetland Indicator Status Categories for Vascular Plants

INDICATOR STATUS	SYMBOL	FREQUENCY
OBLIGATE	OBL	greater than 99%
FACULTATIVE WETLAND	FACW	67-99%
FACULTATIVE	FAC	34-66%
FACULTATIVE UPLAND	FACU	1-33%
UPLAND (Not Listed)	UPL/NL	less than 1%
NO INDICATOR	NI	Undetermined

The Arid West Supplement applies a stepwise approach to determining dominance by hydrophytic vegetation. The first procedure (Indicator 1) is the dominance test where the hydrophytic vegetation criterion is met when greater than 50 percent of the dominant plant species have a wetland indicator status rated OBL, FACW, and/or FAC. Dominant plant species are those that contribute more to the character of the plant community than other species. For the dominance test, the delineator must apply the 50/20 rule where dominant plants are those that individually or collectively account for 50 percent of the total areal coverage of vegetation in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total. If the plant community passes the dominance test, then the vegetation is considered hydrophytic and no additional procedures are required.

If the plant community fails the dominance test, but indicators of hydric soil and wetland hydrology are both present, the delineator must apply Indicator 2 referred to as the "Prevalence Index". To calculate the Prevalence Index, at least 80 percent of the vegetation on the sample plot must be accurately identified and have assigned wetland indicator statuses. The Prevalence Index is a weighted average wetland indicator status of all plants in sampling unit where each indicator status is given a numerical code (OBL=1, FACW=2, FAC=3, FACU=4, NL/UPL=5) and weighting is by abundance based on absolute percent cover. The Prevalence index is calculated using the following formula:

$$PI = \frac{A_{OBL}+2A_{FACW}+3A_{FAC}+4A_{FACU}+5A_{UPL}}{A_{OBL}+A_{FACW}+A_{FAC}+A_{FACU}+A_{UPL}}$$

The Prevalence Index ranges from 1 to 5 and an index less than or equal to 3.0 indicates that hydrophytic vegetation is present. If the plant community fails the Prevalence Index, the delineator proceeds to Indicator 3.

Indicator 3 refers to morphological adaptations made by plants species for life in wetlands. Common adaptations include, but are not limited to, adventitious roots, multi-stemmed trunks, tussocks, and buttressing tree species. Morphological adaptations must be observed on more than 50 percent of the individuals of a FACU species in areas with evidence of hydric soil and wetland hydrology. These species are reassigned as FAC and all other species retain their published indicator statuses. The delineator then recalculates the dominance test (Indicator 1) and the Prevalence Index (Indicator 2) using FAC as an indicator for those species with morphological adaptations. The vegetation is now considered hydrophytic if either test is satisfied.

Hydrology

The Corps jurisdictional wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (minimum of 14 consecutive days in the Arid West Region). In the Arid West Supplement, wetland hydrology indicators are broken down into four groups. Group A consists of direct observation of surface water or saturated soils; Group B consists of evidence of recent inundation; Group C consists of evidence of current or recent soil saturation; Group D consists of characteristics that indicate contemporary rather than historical wet conditions. Within each group, evidence of wetland hydrology can include direct ("primary") indicators, such as visible inundation or saturation, drift lines, and surface sediment deposits (including algal mats) and oxidized root channels, or indirect ("secondary") indicators, such as drainage patterns, the FAC-neutral test and saturation visible on recent aerial imagery. One primary indicator is sufficient to conclude that wetland hydrology is present. In the absence of primary indicators, two or more secondary indicators must be present to conclude that an area has adequate wetland hydrology. Primary and secondary hydrology indicators were used to determine if areas surrounding each sample point in the Project Area satisfied the Corps' hydrology criterion.

Soils

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as:

> *"A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part."*
>
> (Federal Register July 13, 1994)

Soils formed over long periods of time under wetland (anaerobic) conditions often possess characteristics that indicate they meet the definition of hydric soils. Nearly all hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation, or both, for more than a few days. Characteristic hydric soil indicators observable in the field include: organic histosols and histic epipedons; sulfidic material; aquic or peraquic moisture regime; reducing soil conditions; soil colors (gleyed soils or soils with mottles and/or low chroma matrix); and iron and manganese concretions. Hydric mineral soils in the vicinity of the Project Area generally have a characteristic low matrix chroma and distinct or prominent redoximorphic mottles. Chroma designations are determined by comparing a soil sample with a standard Munsell soil color chart (GretagMacbeth 2000). Soil profiles at each sample point in the Project Area were described to include horizon depths, color, redoximorphic features, and texture to determine if the soils satisfy the ACOE criteria for hydric soils. The NRCS manual *Field Indicators of Hydric Soils in the United States* (Version 8.2)(USDA, NRCS 2018) was also used as a guide for determining hydric soils in the Project Area.

3.2 Non-wetland "Other Waters" of the U.S.

Areas that are inundated for sufficient duration and depth to exclude growth of hydrophytic vegetation, such as lakes and ponds, or convey water, such as streams, are also subject to Section 404 jurisdiction. Within Santa Cruz County and the central California Coast, these "other waters" can include intermittent and ephemeral streams, as well as lakes, mudflats, playas, arroyos, and rivers. The Project Area was concurrently evaluated for the presence of "other waters" at the time of the delineation site visit.

Areas delineated as "other waters" are characterized by an ordinary high water (OHW) mark, defined as:

> *...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*
>
> (33 CFR Part 328.3)

"Other waters" are identified in the field by the presence of a defined river or stream bed, a bank, and evidence of the flow of water, or by the absence of emergent vegetation in ponds or lakes. Corps jurisdiction of waters in non-tidal areas extends to the ordinary high water (OHW) mark. "Other waters" within the Project Area were either mapped using sub-meter accuracy GPS units, or digitized using GIS software based on USGS topographic maps and aerial photograph interpretation.

3.3 Difficult Wetland Situations in the Arid West Region

The Arid West Supplement includes guidance for identifying problematic wetlands where indicators may be missing due to natural processes or recent disturbances. It includes examples of problem areas and atypical situations described in the 1987 Corps Manual, as well other more challenging situations. Problem area wetlands are defined in the Arid West Supplement as "naturally occurring wetland types that lack indicators of hydrophytic vegetation, hydric soil, or wetland hydrology periodically due to normal seasonal or annual variability, or permanently due to the nature of soils or plant species on the site." Atypical situations are wetlands in which vegetation, soil or hydrology indicators are absent due to recent human activities or natural events. Where applicable, guidance outlined in the Arid West Supplement regarding difficult situations was followed during the routine wetland delineation.

3.4 Areas Exempt from Section 404 Jurisdiction

Some areas that meet the technical criteria for wetlands or waters may not be jurisdictional under Section 404 of the Clean Water Act. Included in this category are some man-induced wetlands which are areas that have developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities. Examples of man-induced wetlands include, but are not limited to, irrigated wetlands, stock ponds, drainage ditches excavated entirely in uplands, and dredged material disposal areas.

In addition, some isolated wetlands and waters may also be considered outside of Corps jurisdiction as a result of the Supreme Court's decision in *Solid Waste Agency of Northern Cook County (SWANCC) v. United States Army Corps of Engineers* (531 U.S. 159 (2001)). Isolated wetlands and waters are those areas that do not have a surface or groundwater connection to, and are not adjacent to a navigable "Waters of the U.S.", and do not otherwise exhibit an interstate commerce connection. In the Supreme Court decision *Rapanos v. United States* (547 U.S. 715 (2006)), the Court recommended further restrictions on federal jurisdiction over wetlands and required that a "significant nexus" test be applied to those wetlands and waters which are not "navigable". A joint memorandum issued in December 2008 and formalized in April 2011 provides guidance to the Corps and EPA for implementing the Supreme Court's significant nexus test. The *Rapanos* and *SWANCC* decisions are applicable for potential wetlands considered to lack a direct connection or significant nexus with navigable waters.

In this guidance, non-tidal ditches are not considered jurisdictional features unless they have a clearly defined bed, bank and ordinary high water mark; connect directly to a traditional navigable water (TNW), and have one of the five following characteristics: (1) natural stream that has been altered; (2) ditches excavated in waters of the U.S., including wetlands; (3) ditches that have relatively permanent flowing or standing water; (4) ditches that connect two or more jurisdictional waters of the U.S.; or (5) ditches that drain natural bodies of water (including wetlands) into a tributary system of a TNW or interstate water. Moreover, natural or man-made swales are not considered tributaries; however, ditches and swales may be considered jurisdictional if they meet the regulatory definition of "wetlands" (i.e. three parameters).

On October 22, 2019 the Department of Defense (DOD), EPA and USACE published a final rule to repeal the 2015 Clean Water Rule, defining "Waters of the U.S." (DOD et al. 2019). This 2015 Rule was never implemented due to the 2017 Presidential Executive Order entitled "Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the 'Waters of the United States' Rule." Along with the repeal of the 2015 Rule, the 2019 Final Rule re-codifies the regulatory text that existed prior to the 2015 Rule outlined in the 2008 *Rapanos* joint memorandum (effective December 23, 2019).

On December 11, 2018, the EPA and the Corps signed the Proposed Rule: Revised Definition of "Waters of the U.S." (WOTUS) to clarify federal authority under the Clean Water Act consistent with the February 2017 Executive Order (USACE et al. 2019). The proposed definition would replace the pre-2015 (*Rapanos*) regulations. The Public Comment period on the Proposed Rule closed on April 15, 2019. The final WOTUS Rule was published in the Federal Register on April 21, 2020 and will become effective on June 22, 2020.

3.5 Wetlands and Waters of the State

Under California State law, “waters of the state" pertain to “any surface water or groundwater, including saline waters, within the boundaries of the state.” As a result, water quality laws and permitting authority apply to both surface and groundwater. In the absence of a federal nexus, the Porter-Cologne Water Quality Act (2002) assigns overall responsibility for water rights and water quality protection to the SWRCB and directs the RWQCBs to develop and enforce water quality standards within their boundaries.

Following the 2001 U.S. Supreme Court *SWANCC* decision, the SWRCB released a legal memorandum confirming the State’s jurisdiction over isolated wetlands. The memorandum stated that under the California Porter-Cologne Water Quality Control Act, discharges to wetlands and other “waters of the state” are subject to State regulation, including wetlands isolated from navigable waters or their tributaries. In general, the RWQCB regulates discharge into isolated waters in much the same way as they do for Federal jurisdictional waters, using Porter-Cologne rather than Section 404 authority (SWRCB 2001). In the absence of a federal permit requirement, impacts to waters of the state, including wetlands, requires Waste Discharge Requirements (WDR) authorization from the RWQCB (SWRCB 2004).

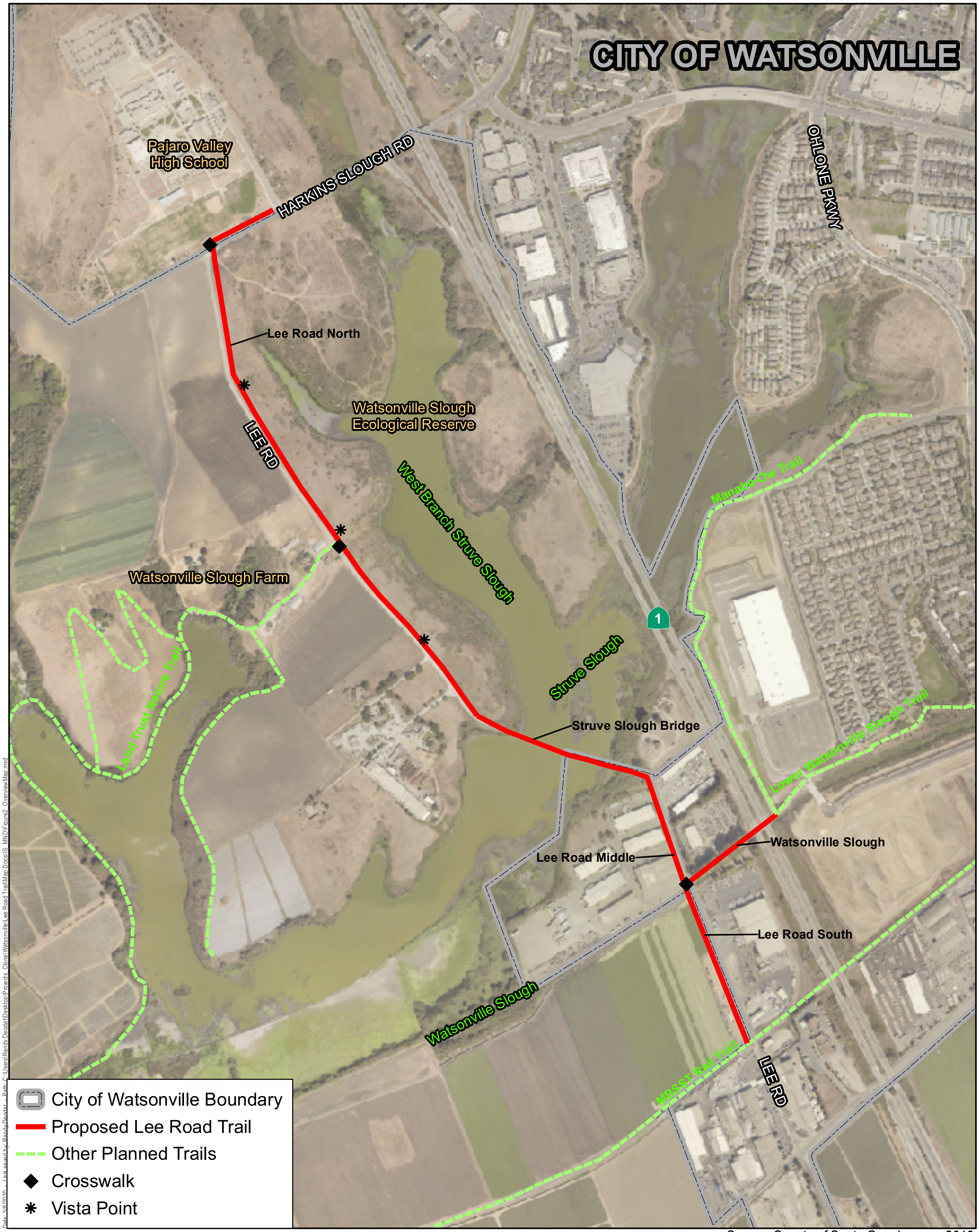
3.6 Potential Coastal Act Wetlands

No technical guidance exists to delineate wetlands in the Coastal Zone. In general, delineators follow the techniques outlined in the 1987 Corps Manual and Regional Supplements. However, as discussed above in Section 2.4, the Coastal Commission requires the existence of only one parameter (vegetation, soils, or hydrology) to establish the presence of wetlands. The Coastal Commission places a particular emphasis on the presence of hydric soils because their formation is considered indicative of persistent, long-term wetland hydrology and the potential to support hydrophytic plants.

4 PROJECT AREA DESCRIPTION

The approximately 54.2-acre linear Study Area extends from near the Pajaro Valley High School driveway (near the intersection Harkins Slough Road and Lee Road), along Lee Road to the south-southeast, southeast across Struve Slough, and along Lee Road south-southeast to the railroad crossing. There is a spur trail along the channelized section of Watsonville Slough, from Lee Road through the Highway 1 underpass, connecting to the existing Manabe-Ow trail system. The Project Area includes the proposed trail, as well as two additional design options considered by the City, and an approximately 150-foot buffer on either side of these alignments (**Figure 2**).

The Project Area is mostly flat to gently sloping with a slight rise in elevation along the edge of the California Department of Fish and Wildlife (CDFW) Watsonville Slough Ecological Reserve (CDFW Reserve) near Struve Slough. In general, the trail is proposed to occur along the existing roadway and, as



Source: County of Santa Cruz Imagery 2016.

Harris & Associates

Figure 2

Lee Road Trail Overview

such, is largely within or adjacent to the developed footprint of the roadway and shoulder on the north side of Struve Slough, and within the industrial developed footprint on the south side of Struve Slough. A bridge would be constructed on the existing seasonally- to perennially-submerged Lee Road within Struve Slough. On the north side of Struve Slough, the proposed trail would begin along Harkins Slough Road at the high school driveway and then extend along the east side of Lee Road, skirting the CDFW Reserve and utilizing a proposed approximately 20-foot easement in some locations (less in others). In this area the Study Area consists of non-native grassland with encroaching coyote bush scrub transitioning to coastal scrub in some locations. The CDFW Reserve and West Struve Slough lie immediately east of the proposed trail.

Agricultural fields and non-native grassland, associated with the Land Trust of Santa Cruz County's Watsonville Slough Farm, are present along the west side of Lee Road. Further southeast on the west side of Lee Road, non-native grassland and landscaping surround the Fitz Fresh Mushrooms Farm. Associated farm infrastructure, paved and dirt roads, and driveways are also present along the west side of Lee Road.

An extension of Hanson's Slough, in particular the area known as Chivos Pond, extends into the agricultural fields, approximately 110 meters (360 feet) from Lee Road. The main body of Hanson's Slough is approximately 275 meters (900 feet) from Lee Road.

The proposed trail includes the Struve Slough Bridge, which would cross the seasonally to perennially-inundated Struve Slough. Here the Project Area consists of the open water and mudflats of the slough, as well as the freshwater marsh and riparian fringe on each side of the crossing.

On the southeast side of the slough, the Project Area transitions from the arroyo willow riparian habitat along the slough to a weedy ruderal area, and then to the urbanized light industrial area along Lee Road. One section along the west side of Lee Road remains in agriculture, immediately south of channelized Watsonville Slough. A eucalyptus grove lines a short span of the existing unpaved path along Watsonville Slough from Lee Road to the Hwy 1 underpass. A narrow strip of freshwater marsh and riparian vegetation is present along Watsonville Slough predominantly southwest of Lee Road.

Vegetation

Six vegetation community/habitat types are present in the vicinity of the Project Area as described by Ecosystems West: non-native grassland, arroyo willow riparian scrub, coastal scrub (coyote brush, blackberry brambles), non-native eucalyptus forest, and ruderal.

Within the Lee Road Trail Project Area, **non-native grasslands** are primarily situated east of Lee Road in the CDFW Reserve. The grasslands within the Reserve are slowly recovering from past disturbance, particularly livestock grazing and agricultural activities. As a result, very few native species were present in non-native grassland identified within the Project Area, and indicator species for native coastal prairie, such as California oatgrass (*Danthonia californica*) and purple needlegrass (*Stipa pulchra*), were observed in one small area (approximately 0.1 acres) on the southern knoll above West Struve Slough and east of the Project Area. This relictual patch of native grasses remains largely dominated by non-native and invasive species and lacks characteristic native annual forbs commonly found in coastal prairies. Non-native grassland occurs on nearly-level to moderate hillslopes throughout the majority of the northern portion of the Project Area along Lee Road north of Struve Slough. Non-native grassland is dominated by wild oats (*Avena* spp.), Harding grass (*Phalaris aquatica*), Italian ryegrass (*Festuca* *perennis*), brome grasses (*Bromus hordeaceus*, *B. diandrus*), barleys (*Hordeum murinum* ssp. *leporinum*, *H. marinum* ssp. *gussoneanum*), six-weeks fescue (*Festuca bromoides*), cutleaf geranium (*Geranium dissectum*), poision hemlock (*Conium maculatum),* curly dock (*Rumex crispus*), and filarees (*Erodium* spp.). Scattered coyote brush (*Baccharis piluaris*) is also widely dispersed within the grassland. A large percentage of plant species identified within this habitat type are listed as invasive weeds with "moderate to high ecological impacts" by the California Invasive Plant Council (Cal-IPC) (2020).

Arroyo willow riparian forest consists of areas dominated almost entirely by dense thickets of arroyo willow (*Salix lasiolepis*), with a relatively undeveloped understory of herbaceous plants and sub-shrubs. Within the Project Area, arroyo willow scrub is located predominantly along the southern fringe of Struve Slough west of Hwy 1. Arroyo willow is typically a small- to medium-sized tree or arborescent shrub with multiple trunks from the base.

The **coastal scrub habitat** type in the Project Area is typified by low to moderate sized woody shrubs with mesophilic leaves and small diameter flexible branches. These shrubs are often relatively short-lived with a shallow root structure and typically occur in shallow, often rocky soils. Due to marine influence, soils tend to be higher in concentration in salts than more inland areas. Coastal scrub tends to persist as a stable natural vegetation community in areas with cool, mesic microclimates and persistent fog. Growth habits of dominant shrubs range from prostrate to arboreal. Within the Project Area, coastal scrub habitat is dominated by dense patches of coyote brush, Pacific blackberry (*Rubus ursinus*) brambles, and poison oak (*Toxicodendron diversilobum*). Grasses and forbs interspersed among openings in the shrub layer include brome grasses, wild oats, Italian ryegrass, pearly everlasting (*Pseudognaphalium californicum*), and Pacific aster (*Symphyrotrichum chilense*).

Non-native eucalyptus forest is comprised of a planted blue gum eucalyptus (*Eucalyptus globulus*) and red gum (*Eucalyptus camaldulensis*) grove/hedgerow with individual non-native pine trees located along the channelized section of Watsonville Slough between Lee Road and Highway 1. Eucalyptus trees are able to rapidly grow from seed or can re-sprout following disturbance (cutting, fire, etc.) to an existing tree. Understory vegetation is often sparse due to litter accumulation and possible allelopathic effects of oils
found in eucalyptus leaf and root exudates. Blue gum eucalyptus trees are an exotic species and rated as "moderately invasive" by the California Invasive Plant Council (Cal-IPC 2020).

Ruderal vegetation is dominated by aggressive, opportunistic species including fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), cheeseweed (*Malva parviflora*), pineapple weed (*Matricaria discoidea*), Bermuda grass (*Cynodon dactylon*), and redstem filaree (*Erodium cicutarium*). Ruderal scrub is comprised of dense thickets of non-native Himalayan blackberry (*Rubus armeniacus*), wild radish (*Raphanus sativus*), and poison hemlock. Ruderal scrub is located south and upslope of the arroyo willow riparian habitat south of Struve Slough and north of the developed/industrialized portion of Lee Road. Due to the proximity to roads and other ongoing disturbances, ruderal areas tend to persist over time and succession to other natural communities is limited.

Hydrology

The Project Area is situated in the Pajaro HUC-8 Watershed (NRCS 2020). The principal natural hydrological sources for the Project Area are direct precipitation, surface runoff, and subsurface sheet flow from adjacent uplands. Subsurface flows in CDFW Reserve are largely conveyed above a restrictive clay plan layer beginning at approximately 16 inches below the surface topsoil cap.

The 2018-2019 rainfall year was above normal for the Watsonville area. Using the nearest NOAA weather station data in Santa Cruz (Watsonville Airport Weather Station), seasonal totals were approximately 115 percent of normal (**Table 2**). This likely contributed to prolonged elevated water table and soil saturation as well as dynamic shifts favoring increased dominance of mesic annual grasses and forbs at the time of the delineation site visits. Currently, rainfall is approximately 93 percent of normal for the 2019-2020 rainfall year.

Table 2. 2018 to 2020 seasonal rainfall totals (inches) compared to 30-year average for Watsonville, CA (Watsonville Municipal Airport weather station).

Rain year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
1981-2010 average	0.03	0.02	0.21	1.07	2.68	4.24	4.50	4.62	3.60	1.66	0.62	0.11	**23.10**
2018-2019	0.02	0.00	0.00	0.10	3.70	2.65	5.23	7.38	5.06	0.38	1.86	0.08	**26.46**
2019-2020	0.01	0.02	0.10	0.00	2.04	8.70	2.04	0.00	5.23	3.24	NR	NR	**21.38**

Soils

The Santa Cruz County Soil Survey (USDA 1980) identifies five soil map units within the Project Area (**Figure 3**). These soils types are described in detail below.

- 103- Aquents, flooded
- 119- Clear Lake clay, 0 to 1 percent slopes
- 123- Cropley silty clay, 2 to 9 percent slopes
- 126/127- Diablo clay, 2 to 25 and 15 to 30 percent slopes
- 177- Watsonville loam, 2 to 15 percent slopes

The Soil Survey descriptions of these mapping units are presented below and includes whether the soils are classified as hydric or not according to the Hydric Soils List for Santa Cruz County (NRCS 2020).

<u>103- Aquents, flooded</u>
The Aquent soil type occurs in permanently inundated areas, typically submerged beneath perennial lentic and lotic waterbodies. This soil type is typically mucky and often gleyed due to prolonged anaerobic/anoxic conditions. Aquents are not formally listed as hydric by the NRCS but due to its occurrence in permanently flooded area, it is considered a hydric soil type. Within the Project Area, Aquents are mapped as occurring beneath the inundated portions of Struve Slough.

<u>119- Clear Lake clay, 0 to 1 percent slopes</u>
Clear Lake clay is a very deep, poorly drained soil type that formed in fine textured alluvium from mixed rock sources. Elevations range from 2 to 2,000 feet and soil permeability is very slow. The surface layer is dark to very dark gray moist clay extending to 45 inches below the surface. Redoximorphic concentrations are common in the upper portion of the soil profile and exhibits a shrink-swell pattern with large surface cracks up to 48 inches deep forming during the dry summer and fall months. Clear Lake clay has a shallow, restricted rooting depth and typically supports annual pasture and seasonally inundated palustrine wetlands. This soil type is classified a hydric soil type by the NRCS. Within the Project Area, Clear Lake clay

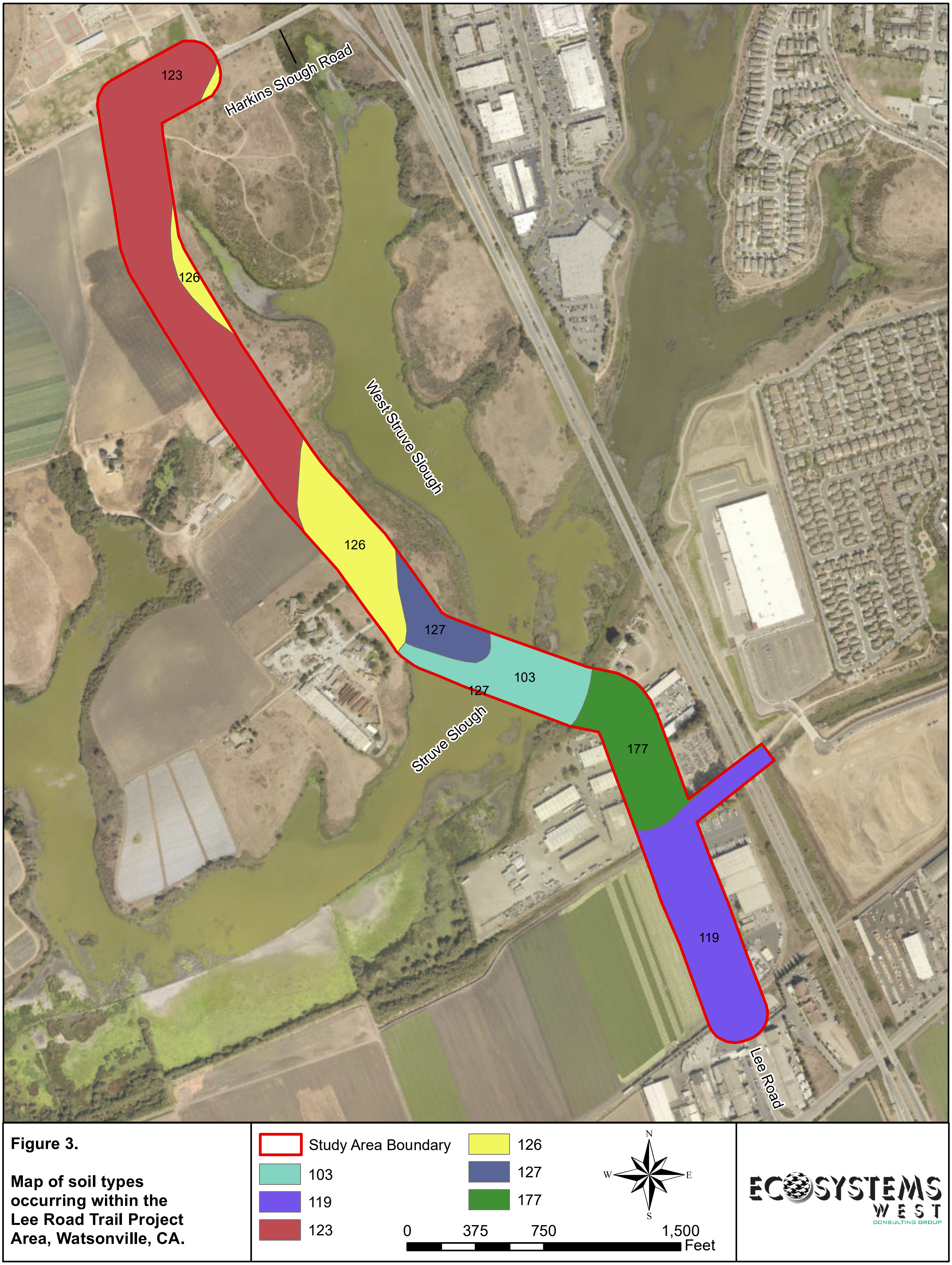


Figure 3.

Map of soil types occurring within the Lee Road Trail Project Area, Watsonville, CA.

is mapped as occurring in the southernmost portion of the Project Area in the channelized reach of Watsonville Slough and along Lee Road in urbanized and agricultural landscapes.

123- Cropley silty clay, 2 to 9 percent slopes

Cropley silty clay is a very deep, moderately well drained soil formed in alluvium from mixed rock sources and found on alluvial fans, floodplains and in small basins. In natural areas this soil type supports grassland and scattered live oak woodland. Cropley clay is commonly used for irrigated row crops, pasture, and fruit trees. The surface layer is typically a very dark gray hard, sticky clay extending to approximately 11 inches. Below this surface layer, soils are dark gray to black with coarse, blocky structure and very fine tubular pores. The shrink-swell potential is very high with cracks up to 2.5 inches extending up to 25 inches deep during the dry summer and fall months. This soil type is considered a hydric soil type by the NRCS in Santa Cruz County. Within the Study Area, this soil type is common in the northernmost portion of the Project Area near the intersection of Harkins Slough Road and Lee Road and beneath the Watsonville Slough Farm agricultural fields west of Lee Road.

126/127- Diablo Clay, 2 to 25 and 15 to 30 percent slopes

Diablo Clay is a mildly alkaline well drained soil type found on complex undulating, rolling uplands. This soil type generally supports grassland and coastal scrub and is often used for livestock grazing and dry farmed grain. The surface layer is a dark to very dark gray silty clay extending to 15 inches below the ground surface. The subsurface layer finely mixed gray to olive gray, moderately alkaline silty clay. Upon drying, this soil type develops deep cracks up to 2 inches wide by 40 inches deep. Diablo clay is considered hydric by the NRCS in Santa Cruz County. Withing the Project Area, this soil type is mapped as occurring within rolling hills supporting the grassland and coastal scrub habitats of the CDFW Watsonville Slough Reserve immediately east of Lee Road.

177- Watsonville Loam, 2 to 15 percent slopes

Watsonville loam is a deep, somewhat poorly drained soil formed in alluvium on coastal terraces. Elevations range from 20 to 1,200 feet and soil permeability is very slow. The surface layer is a very dark grayish brown loam extending up to 20 inches below the surface. Effective rooting depth extends to 60 inches, but roots are largely restricted to cracks in the clay below 20 inches. As a result, this soil type primarily supports grassland, including native coastal prairie, and coastal scrub vegetation. Watsonville loam has a very high clay component and is the primary soil type classified as hydric by the NRCS in Santa Cruz County. Level areas tend to support a perched water table and seasonal wetlands and seeps are common. Within the Project Area, Watsonville loam is mapped as occurring on the southern embankment of the Struve Slough and underlaying light industrial developments on Lee Road between Struve Slough and the channelized portion of Watsonville Slough.

5 RESULTS

Potential jurisdictional areas and sampling points are described in the following sections and shown on the enclosed map in **Appendix A**. Vegetation, soils, and hydrology data collected during the delineation site visit are reported on standard Arid West ACOE data forms presented in **Appendix B**. Photographs of representative sample points and wetland features are provided in **Appendix C**.

This report identifies all areas that met the 1987 ACOE Manual and Arid West Regional Supplement criteria as wetlands or possessed unvegetated, persistent open water with a discernable ordinary high-water mark (OHWM) and could be classified as “other waters” of the United States. This delineation report provides the additional information necessary to make recommendations to the ACOE on those areas that are potentially jurisdictional and those which are not.

Wetland boundaries are typically determined in the field by the predominance of hydrophytic vegetation, evidence of wetland hydrology including soil saturation, ponding, the presence of organic muck, redoximorphic mottles and/or oxidized rhizospheres, and shifts in topographical (geomorphic) position.

5.1 Potential Section 404 Jurisdictional Wetlands

Six potential Section 404 jurisdictional wetlands were identified within the Lee Road Trails Area. These areas met the criteria for hydrophytic wetland vegetation, hydric soils, and wetland hydrology at the time of the July and August 2019 wetland delineation field visits.

Seasonal and Seep Wetlands (SW-1, SW-2, and SEEP-1)(0.34 acres)
Seasonal wetlands are primarily characterized by shallow depressional topography and are inundated or saturated by a combination of direct precipitation, surface runoff from adjacent uplands, and seasonal fluctuations in the water table. Oftentimes, it can be difficult to discern an abrupt transition between wetland and upland vegetation along the margins of seasonal wetlands due to subtle changes in microtopography. Seasonal wetlands are typically dominated by annual plants or rhizomatous, mat-forming perennial species and may exhibit shifts in vegetation composition throughout the year depending on the level of soil moisture. Seep wetlands are formed where groundwater intercepts the ground surface and remains saturated for extended periods. Seeps are typically located at the toeslope of moderate to steep hillslopes and roadcuts, and soils typically remain saturated for most or all of the growing season resulting in a preponderance of hydrophytes and phreatophytes. Within the Project Area, two seasonal wetlands and one seep wetland were identified.

SW-1 is situated in northwest portion of the Project Area near the intersection of Lee Road and Harkins Slough Road. This 0.07-acre seasonal wetland is a shallow, topographic depressional swale that appears to have formed in an unnatural depression and dirt access road to West Struve Slough. This marginal wetland was dominated by weedy, hydrophytic grasses and forbs including Italian ryegrass (*Festuca perennis*; FAC), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*; FAC), and English plantain (*Plantago lanceolata*; FAC). The paired upland sample point contained a lesser amount of these species and was dominated by wild oats (*Avena barbata*; UPL) and brome fescue (*Festuca bromoides*; FACU), with narrow leaf clover (*Trifolium angustifolium*; UPL), and prickly ox-tongue (*Helminthoteca echioides*; FAC) subdominant. When delineating the seasonal wetland boundary in the field, the transition between areas with still-green hydrophytic vegetation to areas dominated by desiccated upland classified species were used to define the edge of the feature. Deep surface cracks in the clay soil was also used to distinguish the wetland boundary.

A larger seasonal wetland (SW-2) is located immediately northeast of SW-1 across Harkin's Slough Road from Pajaro Valley High School. Approximately 0.26 acres of this feature is located within the Project Area boundary although this wetland is not expected to be impacted by the proposed trail or future improvements to Harkins Slough Road. The feature is located in a shallow, meandering swale originating at a storm drain culvert beneath Harkins Slough Road. Dominant wetland vegetation includes beardless wild rye (*Elymus triticoides*; FAC), Santa Barbara sedge (*Carex barbarae*; FAC), spreading rush (*Juncus effusus;* FACW), and arroyo willow (*Salix lasiolepis*; FACW). Adjacent uplands are largely similar to areas surrounding SW-1.

A small 0.01-acre seep wetland (SEEP-1) is located along the eastern roadcut of Lee Road immediately north of Struve Slough. This feature is located near the toe of the southern knoll of the CDFW Reserve and occurs where subsurface groundwater intercepts the roadcut. This feature is dominated almost entirely by Santa Barbara sedge and is surrounded by ruderal, non-native grassland, and coastal scrub vegetation. This feature was dry at the time of the 2019 site visits but appears to be saturated for a sufficient duration during the growing season to support a preponderance of hydrophytes where surrounding areas are largely dominated by upland plants.
The 2019 delineation site visits were conducted during a suitable phenological period for identifying flowering plants to their infraspecific taxon and wetland indicator status. Furthermore, wetland hydrology indicators were clearly observed in this feature and generally consisted of Group A and B primary indicators including soil surface cracks and oxidized rhizospheres along living roots. Hydric soil development was supported by indicator F6 (redox dark surface) comprised of low matrix chroma and distinct or prominent redox concentrations within the upper 12-inches of the profile.

The seasonal wetlands and seep wetland are considered to have a significant nexus with Traditional Navigable Waters (TNW) via surface and subsurface hydrologic connectivity within shallow swales entering into Struve Slough, a Relatively Permanent Water (RPW), with connectivity to the Pacific Ocean.

Freshwater Emergent Marsh (FEM-1, FEM-2, and FEM-3)(1.24 acres)
Freshwater emergent wetlands occur in areas with persistent saturation or inundation in relatively still or slow-moving water bodies. This wetland type is characterized by vegetation that is submerged for a substantial portion of the growing season. These plant species typically occur in boggy areas or along the margins of ditches, ponds, lakes, and sloughs. Within the Project Area, freshwater emergent wetland is limited to the semi-permanently to permanently flooded fringe of Struve Slough and shallow mudflats in the central portion of the Project Area. These area supports perennial, emergent vegetation dominated by narrowleaved cattail (*Typha latifolia;* OBL), California bulrush (*Shoenoplectus californicus*; OBL), water smartweed (*Persicaria amphibia*; OBL), tall flatsedge (*Cyperus eragtrosis*; FACW), floating primrose (*Ludwigia peploides*; OBL), and spotted ladysthumb (*Persicaria maculosa*; FACW). Vegetation is dense along the shoreline and matted or floating in deeper water and above mudflats. Soils are mucky and/or gleyed indicating prolonged inundation. Marsh vegetation transitions abruptly into adjacent coastal scrub and arroyo willow riparian vegetation further up the embankments away from the slough.

The channelized portion of Watsonville Slough also contains freshwater emergent marsh dominated almost entirely by narrowleaved cattail. This narrow feature is contained to a narrow, linear ditch that transitions abruptly onto steep embankments supporting weedy, ruderal vegetation common in urbanized areas. Soils were loamy mucky material and inundation is permanent in the lower portion of the channel although water levels appear to fluctuate significantly throughout the year.

5.2 *Potential "Other Waters" of the U.S.*

One potential non-wetland "other waters" of the U.S. is present within the Project Area. This includes the open water portion Struve Slough, a freshwater marshland and prominent component of the larger approximately 800-acre Watsonville Sloughs complex. Struve Slough is connected via groundwater and flood channels along the Pajaro River levee system to the Pacific Ocean, a Traditional Navigable Water (TNW).

Struve Slough/Open Water (OW-1)(4.87 acres)
Struve Slough is a large, anthropogenically modified freshwater body comprised of several distinct open channels. In the vicinity of the Project Area, Struve Slough is a largely open-water body with scattered mud-flats and emergent freshwater marsh. The hydrology of this feature has been historically modified numerous times, and currently the slough is undergoing active restoration efforts to restore historic hydrologic conditions and wetland function. Recent modifications to levees and agricultural irrigation practices have elevated the water level to a height that has now fully submerged Lee Road within the Project Area. The feature continues to incur seasonal and interannual fluctuations in the water level, but is now largely a perennial, limnetic waterbody. The OHWM is clearly defined both by watermarks on emergent vegetation and asphalt of Lee Road, as well as driftlines and scour marks along the shoreline.

5.3 Areas Potentially Exempt from CWA Sections 401 and 404 Jurisdiction

No areas identified by this delineation as 3-parameter wetlands are considered potentially exempt from jurisdiction under Sections 401 and 404 of the Clean Water Act. Other than arroyo willow riparian thickets and a Pacific blackberry bramble described as Coastal Act wetlands in Section 5.6, all wetlands and “other waters” identified by this delineation are relatively permanent waters (RPWs) with direct connectivity of traditional navigable waters (TNWs), or are wetlands immediately adjacent to RPWs with surface and subsurface hydrologic connectivity. All features are considered to be subject to regulatory permitting by the ACOE and RWQCB.

5.4 Difficult Situations in the Arid West Region

Seasonal wetlands are problematic in that they meet all three wetlands parameters during wetter portions of the year but often lack indicators of wetland hydrology and/or hydrophytic vegetation during the drier portion of the growing season. Because the wetland delineation was completed in July and August, many plants were identified as standing desiccated specimens and late season upland plants were present in some seasonally mesic areas that may not have been present earlier in the growing season. Moreover, direct observation of hydrology (i.e. inundation/saturation) was not observed for the seasonal wetlands and the seep wetland; however, other primary indicators including soil cracks and oxidized rhizospheres were readily apparent. Despite above average seasonal rainfall prior to the delineation site visits, many areas were dry and clay soils were extremely indurated. Nevertheless, clear distinctions between potential wetlands and uplands were distinguishable at the time of the site visits.

5.5 Atypical Situations in the Arid West Region

Atypical situations include wetlands that are the result of unauthorized activities, natural events, or man-induced wetlands purposely or incidentally created by human activities. These include irrigated wetlands from agricultural runoff and impoundments (such as levees) that alter the natural hydrology of an area. No areas identified by this delineation are considered atypical.

5.6 Potential Coastal Act Wetlands

Arroyo Willow Riparian (AWR-1 and AWR-2)(0.56 acres) and Blackberry Scrub-Shrub Wetland (SS-1)(0.20 acres)
Within the Project Area, a 0.49-acre closed-canopy thicket dominated entirely by arroyo willow (*Salix lasiolepis*, FACW) is situated along the southern embankment of Struve slough on either side of Lee Road immediately upslope of the freshwater emergent marsh along the shoreline. A smaller 0.07-acre arroyo willow thicket is located along the northern embankment of the slough west of Lee Road. Once

established, arroyo willow is a tap-rooted phreatophyte capable of utilizing deeper groundwater sources. These thickets are located well above the OHWM and in areas lacking contemporary wetland hydrology and hydric soils. However, these areas are dominated entirely by hydrophytic vegetation and meet the Coastal Act one-parameter wetland definition. As a result, the arroyo willow riparian habitat is regulated by the California Coastal Commission and subject to permitting guidelines outlined in the County of Santa Cruz Local Coastal Program.

Similarly, a 0.20-acre Pacific blackberry bramble is situated on the hillslope immediately above the freshwater emergent marsh along the northern embankment of Struve Slough straddling Lee Road. Pacific blackberry is classified as facultative (FAC) and therefore meets the dominance test for wetland vegetation. While this area also lacks contemporary wetland hydrology and hydric soils, this bramble meets the definition of a Coastal Act one-parameter wetland.

All wetlands identified in previous as potential Waters of the U.S. under the Clean Water Act are also considered jurisdictional under the California Coastal Act.

5.7 Section 401 Water Quality Certification/Waste Discharge Requirement

A Section 401 Water Quality Certification would be required for any discharge into any Waters of the U.S., including wetlands, identified in this delineation. This certification is typically issued concurrently with a Section 404 Individual or Nationwide Permit pursuant to a verified wetland delineation and mitigation and monitoring plan (MMP) for impacts to wetlands and “other waters” subject to federal jurisdiction. In some instances, the RWQCB will seek additional protections and mitigation measures to ensure state and local water quality standards are upheld. For potential direct and indirect impacts to “waters of the state” or for exempt activities or projects with impacts too minimal in area to require a Section 404 permit, the RWQCB may require a Waste Discharge Requirement (WDR) order which functions like a permit and may include mitigation strategies, design modifications, and best management practices.

5.8 CDFW Lake and Streambed Alteration Agreement

Project activities below the break-in-bank of a lotic or lentic waterbody or within the dripline of a riparian corridor likely require a Section 1602 Lake and Streambed Alteration Agreement (LSAA) from the CDFW. Within the Project Area, the construction of the bridge crossing Struve Slough, removal of arroyo willow riparian and Pacific blackberry bramble habitat, and Lee Road culvert improvements within Watsonville Slough will require a Section 1602 notification to CDFW. Where required, a LSAA typically includes similar avoidance, minimization, and mitigation requirements of Section 401, 404, and/or WDR permits but may include additional mitigation measures including revegetation of non-wetland riparian vegetation, erosion control, and wildlife habitat protection and enhancement.

6 CONCLUSION

The Project Area contains six distinct features that met all three wetland indicators. These potential jurisdictional wetlands support a preponderance of hydrophytic vegetation with FAC, FACW, and OBL classified plants, hydric soils characterized by low chroma soils with redoximorphic mottling or muck, and wetland hydrology characterized by direct evidence of saturation or inundation, drainage patterns, soil surface cracks, topographical position, and oxidized root channels. Two additional arroyo willow thickets on the north and south embankments above Struve Slough do not contain evidence of wetland hydrology or hydric soils. Additionally, blackberry scrub is dominated almost entirely by Pacific blackberry, a facultative (FAC) species. Nevertheless, these features meet the Coastal Act one-parameter wetland criteria. Moreover, the Project Area supports the open water/aquatic portion of Struve Slough, a non-wetland "other waters" with a clear limnetic zone and OHWM.

All features identified by this delineation are considered potentially jurisdictional under Sections 401 and 404 of the federal Clean Water Act as they relatively permanent waters (RPWs) or wetlands adjacent to RPWs with a significant nexus to traditional navigable waters (TNWs). All wetlands and non-wetland "other waters" identified in this report are also considered Coastal Act Wetlands subject to jurisdiction by the California Coastal Commission (CCC) under the California Coastal Act and the Santa Cruz County (SCC) Local Coastal Program. **Table 3** presents a summary of potentially jurisdictional wetlands and other waters identified by this delineation.

Table 3. Summary of Potential Jurisdictional Wetlands and Other Waters of the U.S. and California Coastal Zone.

Wetland ID	NWI (Cowardian) Code	Potential Jurisdictional Regulatory Agency	Potential Jurisdictional Area (acres)
Seasonal Wetlands			
SW-1	PEM2E	ACOE, RWQCB, SCC/CCC	0.07
SW-2	PEM2E	ACOE, RWQCB, SCC/CCC	0.26
SEEP-1	PEM1/2E	ACOE, RWQCB, SCC/CCC	0.01
Freshwater Emergent Marsh			
FEM-1	PEM1F/H	ACOE, RWQCB, SCC/CCC	0.28
FEM-2	PEM1H	ACOE, RWQCB, SCC/CCC	0.59
FEM-3	PEM1F	ACOE, RWQCB, SCC/CCC	0.37
		Potential Jurisdictional Wetlands Total	**1.58 acres**
AWR-1	PSS3	CDFW, SCC/CCC	0.07
AWR-2	PSS3	CDFW, SCC/CCC	0.49
SS-1	PSS3	CDFW, SCC/CCC	0.20
		Potential Coastal Act Wetlands Total	**0.76 acres**
Non-Wetland "Other Waters" of the U.S.			
OW-1	L1UB3	ACOE, RWQCB, CDFW, SCC/CCC	4.87
		Potential Jurisdictional Other Waters Total	**4.87 acres**

The conclusions presented in this delineation are based on conditions observed at the time of the field visits conducted in July and August 2019 and subsequent site visits in winter/spring 2020 to confirm contemporary conditions reflect the results of this delineation.

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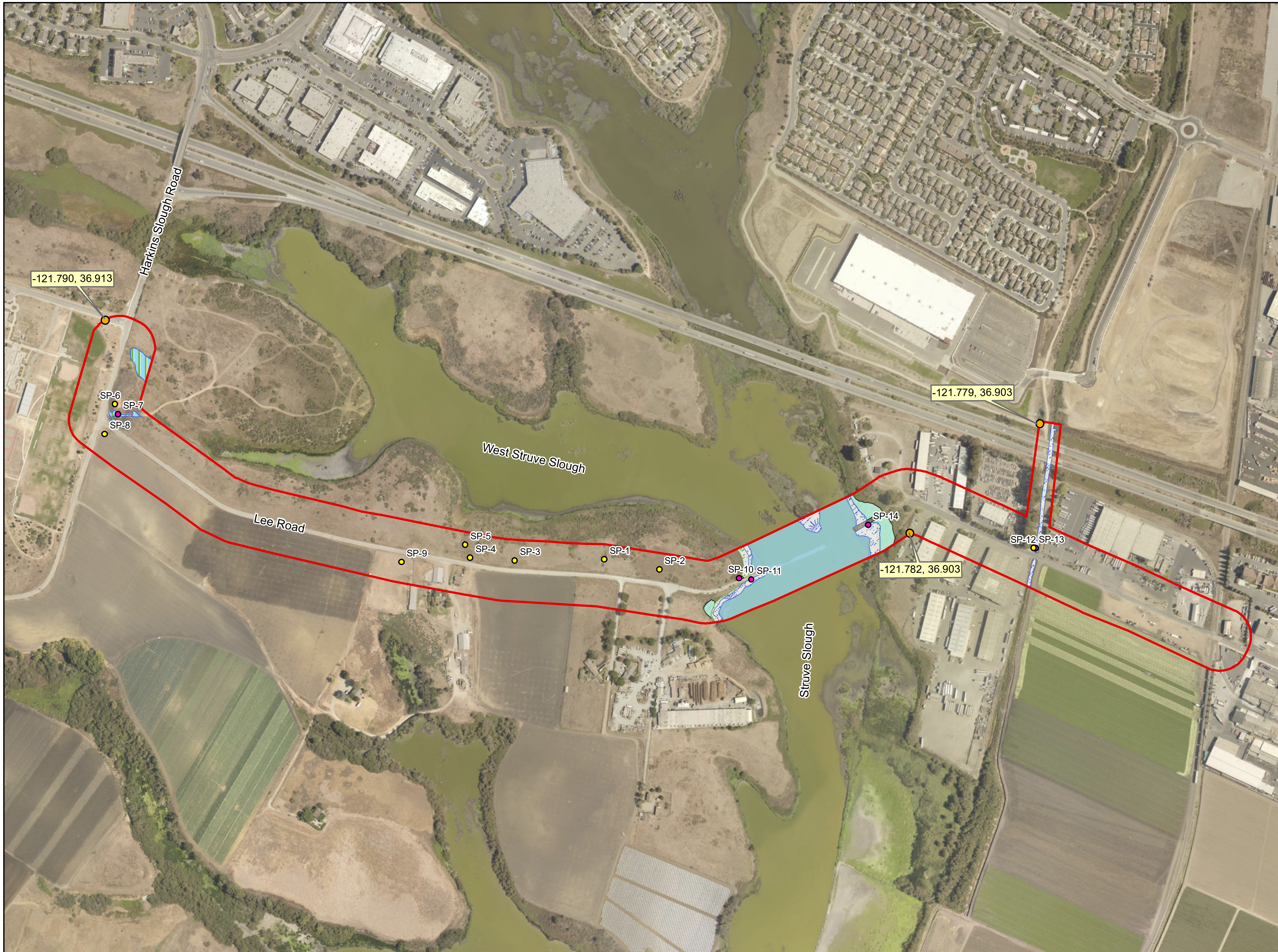
Appendix A. Map of Potential Jurisdictional Wetlands and Waters of the U.S. for the Lee Road Trail Project Area



Appendix A.

Potential Jurisdictional Wetlands and Other Warter of the U.S.

Lee Road Trail Project Area

Study Area Boundary
Upland Sample Points
Wetland Sample Points
Map Reference Points

Potential Jurisdictional Other Waters

Aquatic

Potential Jurisdictional Wetlands

Freshwater Marsh
Seasonal Wetland
Seep

Potential Coastal Act Wetlands

Arroyo Willow Riparian
Scrub-Shrub Wetland

N E S W

1 inch=500 feet

0 250 500 1,000 Feet

Drawn By: J. Davilla, ESW
Date: 5/13/2020
Filepath: E:\Lee Road Trails\Wetland Delineation 2019

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix B. U.S. Army Corps Arid West Region Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 7/1/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP1

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): midslope terrace Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): C-Mediterranean California Lat: 608107.846285 Long: 4085120.59588 Datum: UTM 83

Soil Map Unit Name: 126- Diablo clay, 5-25 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✔	Is the Sampled Area within a Wetland?	Yes ____ No ✔
Hydric Soil Present?	Yes ____	No ✔		
Wetland Hydrology Present?	Yes ____	No ✔		

Remarks:

Vegetation dominated by weedy, annual plants with no evidence of hydric soils or contemporary wetland hydrology despite well above average precipitation during the previous 2018/19 rainy season.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Festuca perennis	40	Y	FAC
2. Bromus hordeaceus	25	Y	FACU
3. Symphyotrichum chillense	25	Y	UPL
4. Convolvulus arvensis	10	N	UPL
5. Plantago lanceolata	3	N	FAC
6. Helminthotheca echiodes	2	N	FAC
7.			
8.			
= Total Cover	105		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	45	x 3 =	135
FACU species	25	x 4 =	100
UPL species	35	x 5 =	175
Column Totals:	105 (A)		410 (B)

Prevalence Index = B/A = 3.90

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks:

This sample point is dominated by weedy, invasive grasses and forbs common in disturbed annual grasslands and ruderal areas.

SOIL

Sampling Point: SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					silty clay	uniform profile
14								shovel refusual

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: unknown

Depth (inches): 14

Hydric Soil Present? Yes ______ No ✔

Remarks:

Uniform low chroma clay profile but no evidence of redoximorphic mottles or other hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✔ Depth (inches): ____________

Water Table Present? Yes ______ No ✔ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✔ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No direct or indirect evidence of wetland hydrology at this sample point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 7/1/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP2

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): upper toeslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): C-Mediterranean California Lat: 608161.956769 Long: 4085049.18395 Datum: UTM 83

Soil Map Unit Name: 127- Diablo clay, 15-30 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✔
Hydric Soil Present?	Yes ___	No ✔
Wetland Hydrology Present?	Yes ___	No ✔

Is the Sampled Area within a Wetland? Yes ___ No ✔

Remarks:

Vegetation dominated by weedy, annual plants with no evidence of hydric soils or contemporary wetland hydrology despite well above average precipitation during the previous 2018/19 rainy season.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Bromus hordeaceus	50	Y	FACU
2. Festuca perennis	20	Y	FAC
3. Raphanus sativus	20	Y	UPL
4. Avena barbata	10	N	UPL
5. Helminthotheca echioides	5	N	FAC
6. Vicia sativa	3	N	UPL
7. Bromus diandrus	2	N	UPL
8.			
= Total Cover	110		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	25	x 3 =	75
FACU species	50	x 4 =	200
UPL species	35	x 5 =	175
Column Totals:	110 (A)		450 (B)

Prevalence Index = B/A = 4.09

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks:

This sample point is dominated by weedy, invasive grasses and forbs common in disturbed annual grasslands and ruderal areas.

SOIL

Sampling Point: SP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	100					clay loam	uniform profile

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: unknown

Depth (inches): 16

Hydric Soil Present? Yes ______ No ✔

Remarks:

Low chroma (dark) clay soils but no evidence of hydric soil development at this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✔ Depth (inches): ____________

Water Table Present? Yes ______ No ✔ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✔ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No direct or indirect evidence of wetland hydrology at this sample point. No oxidized rhizospheres along living roots, surface soil cracks, or other indirect evidence of contemporary wetland hydrology was observed at this sample point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 7/1/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP3

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C-Mediterranean California Lat: 608001.093016 Long: 4085268.19273 Datum: UTM 83

Soil Map Unit Name: 126- Diablo clay, 5-25 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✔	Is the Sampled Area within a Wetland? Yes ____ No ✔
Hydric Soil Present?	Yes ____	No ✔	
Wetland Hydrology Present?	Yes ____	No ✔	

Remarks:

Dense infestation of Harding grass (Phalaris aqutica; FACU). Sample point is a good proxy for other similar areas dominated by Harding grass within the CDFW Reserve.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquaqtica	80	Y	FACU
2. Festuca bromoides	10	N	FACU
3. Bromus hordeaceus	10	N	FACU
4. Rumex crispus	2	N	FAC
5.			
6.			
7.			
8.			
= Total Cover	102		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	2	x 3 = 6
FACU species	100	x 4 = 400
UPL species		x 5 =
Column Totals:	102 (A)	406 (B)

Prevalence Index = B/A = 3.98

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks:

Dense patch of Harding grass, indicative of many similar areas adjacent to the fenceline along Lee Road within the CDFW Reserve.

SOIL

Sampling Point: SP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					clay	uniform profile

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR C**)
__ 1 cm Muck (A9) (**LRR D**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR C**)
__ 2 cm Muck (A10) (**LRR B**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: unknown

Depth (inches): 14

Hydric Soil Present? Yes ___ No ✔

Remarks:

Low chroma (dark) clay soils but no evidence of hydric soil development at this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1) (**Nonriverine**)
__ Sediment Deposits (B2) (**Nonriverine**)
__ Drift Deposits (B3) (**Nonriverine**)
__ Surface Soil Cracks (B6)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
__ Biotic Crust (B12)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Oxidized Rhizospheres along Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

__ Water Marks (B1) (**Riverine**)
__ Sediment Deposits (B2) (**Riverine**)
__ Drift Deposits (B3) (**Riverine**)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___
Water Table Present? Yes ___ No ✔ Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No direct or indirect evidence of wetland hydrology at this sample point. No oxidized rhizospheres along living roots, surface soil cracks, or other indirect evidence of contemporary wetland hydrology was observed at this sample point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 7/1/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP4

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C-Mediterranean California Lat: 607951.549609 Long: 4085268.19273 Datum: UTM 83

Soil Map Unit Name: 126- Diablo clay, 5-25 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✔
Hydric Soil Present?	Yes ___	No ✔
Wetland Hydrology Present?	Yes ___	No ✔

Is the Sampled Area within a Wetland? Yes ___ No ✔

Remarks:

This upland sample point is a good proxy for other similar non-wetland areas where poison hemlock is the only dominant hydrophyte.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Conium maculatum	60	Y	FACW
2. Raphanus sativus	30	Y	UPL
3. Festuca perennis	10	N	FAC
4. Bromus diandrus	5	N	UPL
5. Bromus hordeaceus	2	N	FACU
6. Rumex crispus	1	N	FAC
7.			
8.			
= Total Cover	108		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	60	x 2 =	120
FAC species	11	x 3 =	33
FACU species	2	x 4 =	8
UPL species	35	x 5 =	175
Column Totals:	108 (A)		336 (B)

Prevalence Index = B/A = 3.11

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks:

Despite 60% cover by Conium maculatum, this area is entirely dominated by weedy species typical of highly disturbed grasslands adjacent to roads. This sample point does not meet the dominance test or prevalence index.

SOIL

Sampling Point: SP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/2	100					loamy clay	uniform profile

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: unknown

Depth (inches): 14

Hydric Soil Present? Yes ______ No ✔

Remarks:

Low chroma (dark) clay soils but no evidence of hydric soil development at this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✔ Depth (inches): ____________

Water Table Present? Yes ______ No ✔ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✔ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No direct or indirect evidence of wetland hydrology at this sample point. No oxidized rhizospheres along living roots, surface soil cracks, or other indirect evidence of contemporary wetland hydrology was observed at this sample point. Hemlock appears to persist due to disturbance and clay soils and not contemporary wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 7/1/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP5

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C-Mediterranean California Lat: 607959.792027 Long: 4085288.45131 Datum: UTM 83

Soil Map Unit Name: 123- Cropley silty clay, 2-9 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No	
Hydrophytic Vegetation Present?		✔	**Is the Sampled Area within a Wetland?** Yes ____ No ✔
Hydric Soil Present?		✔	
Wetland Hydrology Present?		✔	

Remarks:

This upland sample point does not exhibit positive wetland indicators despite 40% cover by Rumex cripus (FAC).

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Rumex crispus	40	Y	FAC
2. Bromus hordeaceus	40	Y	FACU
3. Festuca perennis	10	N	FAC
4. Bromus diandrus	5	N	UPL
5. Carduus pycnocephalus	5	N	UPL
6.			
7.			
8.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	40	x 3 = 120
FACU species	40	x 4 = 160
UPL species	10	x 5 = 50
Column Totals:	100 (A)	330 (B)

Prevalence Index = B/A = 3.30

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks:

Despite presence of FAC species, this sample point does not meet the dominance test or prevalence index.

SOIL

Sampling Point: SP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	100					clay	uniform profile

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: unknown

Depth (inches): 16

Hydric Soil Present? Yes ______ No ✔

Remarks:

Low chroma (dark) clay soils but no evidence of hydric soil development at this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✔ Depth (inches): ____________

Water Table Present? Yes ______ No ✔ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✔ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No direct or indirect evidence of wetland hydrology at this sample point. No oxidized rhizospheres along living roots, surface soil cracks, or other indirect evidence of contemporary wetland hydrology was observed at this sample point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 7/2/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP6

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): C-Mediterranean California Lat: 607699.473308 Long: 4085833.58653 Datum: UTM 83

Soil Map Unit Name: 123- Cropley silty clay, 2-9 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✔
Hydric Soil Present?		✔
Wetland Hydrology Present?		✔

Is the Sampled Area within a Wetland? Yes ___ No ✔

Remarks:

Upland sample point does not exhibit positive wetland indicators.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Avena barbata	30	Y	UPL
2. Festuca bromoides	30	Y	FACU
3. Plantago lanceolata	25	Y	FAC
4. Festuca perennis	15	N	FAC
5. Trifolium angustifolium	10	N	UPL
6. Hordeum marinum ssp. gussoneanum	5	N	FAC
7. Helminthotheca echioides	2	N	FAC
8.			
= Total Cover	117		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	47	x 3 = 141
FACU species	30	x 4 = 120
UPL species	40	x 5 = 200
Column Totals:	117 (A)	461 (B)

Prevalence Index = B/A = 3.94

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks:

Weedy sample point dominated by upland invasive grasses and forbs.

SOIL

Sampling Point: SP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	100					clay loam	uniform profile

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: unknown

Depth (inches): 16

Hydric Soil Present? Yes ______ No ✔

Remarks:

Low chroma (dark) clay soils but no evidence of hydric soil development at this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): ___________
Water Table Present? Yes _____ No ✔ Depth (inches): ___________
Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): ___________

Wetland Hydrology Present? Yes ______ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No direct or indirect evidence of wetland hydrology at this sample point. No oxidized rhizospheres along living roots, surface soil cracks, or other indirect evidence of contemporary wetland hydrology was observed at this sample point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 7/2/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP7

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): terrace depression Local relief (concave, convex, none): none Slope (%): 0-5

Subregion (LRR): C-Mediterranean California Lat: 607691.920425 Long: 4085818.81949 Datum: UTM 83

Soil Map Unit Name: 123- Cropley silty clay, 2-9 percent slopes NWI classification: PEM2E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No ____	**Is the Sampled Area within a Wetland?** **Yes ✔ No ____**
Hydric Soil Present?	Yes ✔ No ____	
Wetland Hydrology Present?	Yes ✔ No ____	

Remarks:

Marginal seasonal wetland domianted by weedy FAC grasses and indirect evidence of seasonal wetland hydrology. All three wetland inidcator criteria met for this sample point.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Hordeum marinum ssp. gussoneanum	40	Y	FAC
2. Festuca perennis	40	Y	FAC
3. Plantago lanceolata	15	N	FAC
4. Convolvulus arvensis	3	N	UPL
5. Trifolium angustifolium	2	N	UPL
6.			
7.			
8.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	95	x 3 =	285
FACU species		x 4 =	
UPL species	5	x 5 =	25
Column Totals:	100 (A)		310 (B)

Prevalence Index = B/A = 3.10

Hydrophytic Vegetation Indicators:

✔ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ✔ No ____**

Remarks:

Dominated by weedy FAC grasses typical of disturbed seasonal wetland depressons. Meets domianance criteria for hydrophytic vegetation.

SOIL

Sampling Point: SP7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	95	7.5YR 5/8	5	C	PL/M	loamy clay	shovel refusal at 12"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay pan

Depth (inches): 12

Hydric Soil Present? Yes ✔ No ___

Remarks:

Low chroma (dark) clay soils with prominent redoximorphic mottles meets the F6 criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✔ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___

Water Table Present? Yes ___ No ✔ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): ___

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary evidence of seasonal wetland hydrology exhibited by deep soil surface cracks in clay soil and presence of oxidized rhizoshperes along living roots.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail   City/County: Watsonville/Santa Cruz   Sampling Date: 7/2/2019

Applicant/Owner: City of Watsonville   State: CA   Sampling Point: SP8

Investigator(s): Justin Davilla   Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): terrace depression   Local relief (concave, convex, none): none   Slope (%): 0

Subregion (LRR): C-Mediterranean California   Lat: 607657.641129   Long: ____   Datum: UTM 83

Soil Map Unit Name: 123- Cropley silty clay, 2-9 percent slopes   NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed?   Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✔
Hydric Soil Present?	Yes ____	No ✔
Wetland Hydrology Present?	Yes ____	No ✔

Is the Sampled Area within a Wetland? Yes ____ No ✔

Remarks:

Upland sample point does not exhibit positive wetland indicators.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Avena sativa	95	Y	UPL
2. Malva parviflora	2	N	UPL
3. Sonchus asper	1	N	FAC
4. Carduus pycnocephalus	1	N	UPL
5. Avena barbata	1	N	UPL
6.			
7.			
8.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0   % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	2	x 3 =	6
FACU species		x 4 =	
UPL species	98	x 5 =	490
Column Totals:	100 (A)		496 (B)

Prevalence Index = B/A = 4.96

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks:

Adjacent to active agricultural fields, sample point is domianted by upland wild oat cultivars.

SOIL

Sampling Point: SP8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1						clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay pan

Depth (inches): 16

Hydric Soil Present? Yes ✔ **No** ___

Remarks:

Low chroma (dark) clay soils but no evidence of hydric soil development at this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___
Water Table Present? Yes ___ No ✔ Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): ___

Wetland Hydrology Present? Yes ___ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No direct or indirect evidence of wetland hydrology at this sample point. No oxidized rhizospheres along living roots, surface soil cracks, or other indirect evidence of contemporary wetland hydrology was observed at this sample point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail   City/County: Watsonville/Santa Cruz   Sampling Date: 7/2/2019

Applicant/Owner: City of Watsonville   State: CA   Sampling Point: SP9

Investigator(s): Justin Davilla   Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): terrace   Local relief (concave, convex, none): none   Slope (%): 0

Subregion (LRR): C-Mediterranean California   Lat: 607865.705032   Long: 4085337.21984   Datum: UTM 83

Soil Map Unit Name: 123- Cropley silty clay, 2-9 percent slopes   NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ✔, or Hydrology ___ significantly disturbed?   Are "Normal Circumstances" present? Yes ✔ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✔
Hydric Soil Present?		✔
Wetland Hydrology Present?		✔

Is the Sampled Area within a Wetland? Yes ___ No ✔

Remarks:

Upland sample point does not exhibit positive wetland indicators. Located on terrace with former home and barn site and significantly disturbed vegetation and soils.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Festuca bromoides	35	Y	FACU
2. Plantago coronopus	25	Y	FAC
3. Bromus hordeaceus	10	N	FACU
4. Festuca perennis	10	N	FAC
5. Hordeum marinum ssp. gussoneanum	10	N	FAC
6. Hordeum murinum ssp. leporinum	5	N	UPL
7. Rumex pulcher	5	N	FAC
8.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0   % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	50	x 3 =	150
FACU species	45	x 4 =	180
UPL species	5	x 5 =	25
Column Totals:	100 (A)		345 (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks:

Sample point dominated by weedy species characteristic of highly disturbed areas. Sample point does not meet the dominance test or the prevalence index despite presence of FAC species.

SOIL

Sampling Point: SP9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/3	40					sand loam	Not cropley clay as mapped.
0-12	10YR 2/2	10					loamy clay	Cropley clay component.
0-12	Fill/Rock	50					fill	Imported fill to level terreace
								for former home/barn. Shovel
								refulsal on fill/clay pan at 12".

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: unknown

Depth (inches): 12

Hydric Soil Present? Yes ______ No ✔

Remarks:

Mixed soil profile with significant non-native fill component and only 10% native clay. No evidence of hydric soil development at this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): ____________

Water Table Present? Yes _____ No ✔ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No direct or indirect evidence of wetland hydrology at this sample point. No oxidized rhizospheres along living roots, surface soil cracks, or other indirect evidence of contemporary wetland hydrology was observed at this sample point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 8/19/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP10

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): roadcut Local relief (concave, convex, none): none Slope (%): 25

Subregion (LRR): C-Mediterranean California Lat: 608246.096429 Long: 4084952.30571 Datum: UTM 83

Soil Map Unit Name: 127- Diablo clay, 15-30 percent slopes NWI classification: PEM1/2E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____
Hydric Soil Present?	Yes ✔	No ____
Wetland Hydrology Present?	Yes ✔	No ____

Is the Sampled Area within a Wetland? **Yes** ✔ **No** ____

Remarks:

Roadside seep domianted by Carex barbarae (FAC), a perennial sedge common to seasonally saturated wetlands and seeps.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Carex barbarae	90	Y	FAC
2. Rubus ursinus	5	N	FAC
3. Foeniculum vulgare	3	N	UPL
4.			
5.			
6.			
7.			
8.			
	98 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	95	x 3 =	285
FACU species		x 4 =	
UPL species	3	x 5 =	15
Column Totals:	98 (A)		300 (B)

Prevalence Index = B/A = 3.06

Hydrophytic Vegetation Indicators:

- ✔ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✔ **No** ____

Remarks:

Dense patch of Carex barbarae (FAC) adjacent to upland roadcut subject to seasonal, sub-surface seepage.

SOIL

Sampling Point: SP10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	5Y 3/1	97	7.5YR 4/6	3	C	PL/M	loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: unknown

Depth (inches): 16

Hydric Soil Present? Yes ✔ **No** ___

Remarks:

Low chroma (dark) clay soils with prominent redoximorphic mottles meets the F6 criteria for hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ✔ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✔	
Water Table Present?		✔	
Saturation Present? (includes capillary fringe)		✔	

Wetland Hydrology Present? Yes ✔ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary evidence of seasonal wetland hydrology exhibited by deep soil surface cracks in clay soil and presence of oxidized rhizshperes along living roots.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 8/19/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP11

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): edge of open water Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C-Mediterranean California Lat: 608259.437156 Long: 4084937.30496 Datum: UTM 83

Soil Map Unit Name: 103- Aquents NWI classification: PEM1F/H

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No ____	**Is the Sampled Area within a Wetland?**	**Yes ✔ No ____**
Hydric Soil Present?	Yes ✔ No ____		
Wetland Hydrology Present?	Yes ✔ No ____		

Remarks:

Emergent freshwater marsh along the northern embankent of Struve Slough. No paired sample point as adjacent uplands are comprised of an asphalt road. Sample point is a good proxy for marsh fringe along northern Struve Slough.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Persicaria amphibia	65	Y	OBL
2. Typha latifolia	20	Y	OBL
3. Schoenoplectus californica	20	Y	OBL
4.			
5.			
6.			
7.			
8.			
= Total Cover	105		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	105	x 1 =	105
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	105 (A)		105 (B)

Prevalence Index = B/A = 1.0

Hydrophytic Vegetation Indicators:

✔ Dominance Test is >50%

✔ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No ____

Remarks:

Sample point domianted by obligate, emergent wetland vegetation.

SOIL

Sampling Point: SP11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	black organic	30					muck	
0-12	10YR 3/1	45	7.5YR 4/6	5	C	M	sand loam	
0-12	Gley 3/N	20					sand muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ✔ Sandy Mucky Mineral (S1)
- ✔ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel and roots

Depth (inches): 12

Hydric Soil Present? Yes ✔ **No** ___

Remarks:

Mucky, gleyed soils throughout saturated soil profile. Evidence of redoximorphic mottles in sandy loam component as well.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ✔ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?	✔		(adjacent)
Water Table Present?			NA
Saturation Present? (includes capillary fringe)	✔		surface

Wetland Hydrology Present? Yes ✔ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary evidence of seasonal wetland hydrology exhibited by deep soil surface cracks in clay soil and presence of oxidized rhizoshperes along living roots.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 8/19/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP12

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): channel/ditch Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C-Mediterranean California Lat: 608628.135298 Long: 4084937.30496 Datum: UTM 83

Soil Map Unit Name: 119- Clear Lake clay, drained, 0-1 percent slopes. NWI classification: PEM1F

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ___
Hydric Soil Present?	Yes ✔	No ___
Wetland Hydrology Present?	Yes ✔	No ___

Is the Sampled Area within a Wetland? **Yes** ✔ **No** ___

Remarks:

Emergent freshwater marsh vegetation within artificially channelized (ditch) portion of Watsonville Slough.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Typha latifolia	90	Y	OBL
2. Persicaria maculosa	10	N	FACW
3. Helminthoteca echioides	5	N	FAC
4. Cyperus eragrostis	2	N	FACW
5.			
6.			
7.			
8.			
	107 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	12	x 2 =	24
FAC species	5	x 3 =	15
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	107 (A)		105 (B)

Prevalence Index = B/A = 1.20

Hydrophytic Vegetation Indicators:

- ✔ Dominance Test is >50%
- ✔ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✔ **No** ___

Remarks:

Sample point domianted by obligate broadleaved cattails, but other plants common in urban, channelized wetland ditches.

SOIL

Sampling Point: SP12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					loamy	
				5			muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ✔ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✔ **No** ______

Remarks:

Low chroma loamy muck throughout soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ✔ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✔	(adjacent)
Water Table Present?	✔		6"
Saturation Present? (includes capillary fringe)	✔		surface

Wetland Hydrology Present? Yes ✔ **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturated to surface adjacent to standing water in channel/ditch.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 8/19/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP13

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 15

Subregion (LRR): C-Mediterranean California Lat: 608626.245453 Long: 4084668.60589 Datum: UTM 83

Soil Map Unit Name: 119- Clear Lake clay, drained, 0-1 percent slopes. NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ✔, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✔
Hydric Soil Present?		✔
Wetland Hydrology Present?		✔
Is the Sampled Area within a Wetland?		✔

Remarks:

Upland sample point does not exhibit positive wetland indicators. Located on embankment of channelized/ditch portion of Watsonville Slough.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Avena barbata	25	Y	UPL
2. Raphanus sativus	25	Y	UPL
3. Bromus diandrus	20	Y	UPL
4. Festuca perennis	10	N	UPL
5.			
6.			
7.			
8.			
= Total Cover	80		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species	80	x 5 = 400
Column Totals:	80 (A)	400 (B)

Prevalence Index = B/A = 5.0

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks:

Dominated entirely by weedy, upland vegetation.

SOIL

Sampling Point: SP13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/3	15					sand loam	
0-12	unconsolidated fill material	85					rock fill	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Rock fill

Depth (inches): 12

Hydric Soil Present? Yes ___ No ✔

Remarks:

Mixed soil profile with significant non-native fill component and only 15% mineral soil. No evidence of hydric soil development at this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___

Water Table Present? Yes ___ No ✔ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No direct or indirect evidence of wetland hydrology at this sample point. No oxidized rhizospheres along living roots, surface soil cracks, or other indirect evidence of contemporary wetland hydrology was observed at this sample point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lee Road Trail City/County: Watsonville/Santa Cruz Sampling Date: 8/19/2019

Applicant/Owner: City of Watsonville State: CA Sampling Point: SP14

Investigator(s): Justin Davilla Section, Township, Range: S7, T12S-R2E

Landform (hillslope, terrace, etc.): edge of open water Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C-Mediterranean California Lat: 608456.014104 Long: 4084875.31404 Datum: UTM 83

Soil Map Unit Name: 103- Aquents NWI classification: PEM1H

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No ___	Is the Sampled Area within a Wetland? Yes ✔ No ___
Hydric Soil Present?	Yes ✔ No ___	
Wetland Hydrology Present?	Yes ✔ No ___	

Remarks:

Emergent freshwater marsh along the southern embankent of Struve Slough. No paired sample point as adjacent uplands are comprised of an asphalt road. Sample point is a good proxy for marsh fringe along southen Struve Slough.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ~100 sq ft)			
1. Ludwigia peploides	60	Y	OBL
2. Persicaria amphibia	20	Y	OBL
3. Persicaria maculosa	5	N	FACW
4. Typha latifolia	5	N	OBL
5.			
6.			
7.			
8.			
= Total Cover	105		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 10 (water) % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	85	x 1 = 85
FACW species	5	x 2 = 10
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	80 (A)	95 (B)

Prevalence Index = B/A = 1.19

Hydrophytic Vegetation Indicators:

✔ Dominance Test is >50%

✔ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks:

Sample point domianted by obligate, emergent wetland vegetation.

SOIL

Sampling Point: SP14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	open water	100					water	
6-16	10YR 2/1	100		5	C	M	loamy muck	some rock and sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ✔ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel and roots

Depth (inches): 16

Hydric Soil Present? Yes ✔ No ______

Remarks:

Low chroma loamy muck throughout soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ✔ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✔ No ______ Depth (inches): 6

Water Table Present? Yes ______ No ______ Depth (inches): NA

Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): NA

Wetland Hydrology Present? Yes ✔ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sample point in shallow standing within Struve Slough immediately west of Lee Road.

Appendix C. Representative Photographs of the Lee Road Trail Project Area

Above. Representative upland Sample Point (SP-1) in the southern portion of the CDFW Ecological Reserve.

Below. Seasonal wetland sample point (SP-7) in the northern portion of the CDFW Reserve near the intersection of Harkins Slough Road and Lee Road.

Above. Seep Wetland (SP-10) located on eastern roadcut of Lee Road immediately north of Struve Slough.

Below. Freshwater emergent marsh fringe (SP-11) on northern embankment of Struve Slough west of Lee Road.

ECOSYSTEMS WEST
CONSULTING GROUP

Above. Freshwater emergent marsh (SP-14) dominated by smartweed and floating primrose along southern fringe of Struve Slough.

Below. Emergent marsh dominated by narrowleaved cattail (SP-12) in the channelized portion of Watsonville Slough east of Lee Road.

ECOSYSTEMS WEST
CONSULTING GROUP

Above. Mudflat dominated by California bulrush marshland looking north into open water of Struve Slough along submerged roadway.

Below. Lee Road looking north entering submerged portion within Struve Slough with arroyo willow riparian straddling the roadway.

ECOSYSTEMS WEST CONSULTING GROUP

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Attachment F

Approval Letter from
County of Santa Cruz

and

Geotechnical Investigation (September 2020)

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COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
KATHLEEN MOLLOY, PLANNING DIRECTOR

16 December 2020

Attn: Kate Giberson
450 Lincoln Street, Suite 103
Salinas, CA 93901

Subject: Review of the Geotechnical Investigation – Design Phase for Lee Road Trail, Watsonville, California/APN 052-091-41 revised 4 September 2020 by Pacific Crest Engineering Inc. - Project No. 1922-SZ81-C41

Project Site: Lee Road Trail
APN 052-091-41
Application No. REV201060

Dear Applicant:

The purpose of this letter is to inform you that the Planning Department has accepted the subject report for the Development Permit Application phase of the project. The subject report provides preliminary geotechnical engineering design criteria to facilitate preparation of the 65% Complete Design project plan set. Prior to the submittal of Building Permit Application for the project, the following items shall be required:

1. The project includes a pedestrian bridge crossing the approximate 700 feet wide Struve Slough. We understand four abutments are proposed within the slough. Lee Road paralleling the proposed pedestrian bridge alignment has been underwater year around for roughly the last decade due to ground subsidence and/or sediment buildup. As outlined in the subject report, supplemental cone penetrometer (CPT) soundings are recommended at the proposed pile locations within the slough in order to more fully characterize the subsurface conditions and liquefaction potential across the bridge site. Overwater equipment will be needed to complete the required supplemental subsurface exploration;

2. As outlined in the subject report, the Basin Deposits underlying the proposed bridge site are liquefiable, resulting in a Site Class F designation. With the fundamental period of vibration for the proposed bridge structure expected to exceed 0.5 seconds, a site-specific ground motion response analysis is required to determine spectral acceleration values for the bridge structure. Please request your geotechnical engineer provide seismic design values for the proposed bridge structure; and

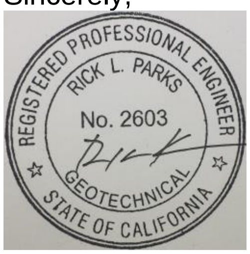
3. The liquefaction analysis presented in the subject report is based upon a mean peak ground acceleration of 0.63g. Using the ASCE 7 Hazard Tool, County staff determined a peak ground acceleration without adjustment for site soil class of 0.95g is applicable for the project site.

Please request your geotechnical engineer address the discrepancy between the aforementioned acceleration values and to confirm the Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration has been utilized for project site seismic analyses.

Please note that this determination may be appealed within 14 calendar days of the date of service. Additional information regarding the appeals process may be found online at: http://www.sccoplanning.com/PlanningHome/ZoningDevelopment/Appeals.aspx

If we can be of any further assistance, please contact the undersigned at:
rick.parks@santacruzcounty.us

Sincerely,



Rick Parks, GE 2603
Civil Engineer – Environmental Planning

Cc: Pacific Crest Engineering, Inc., Attn: Elizabeth Mitchell, GE
Planning Department, Attn: Randall Adams
City of Watsonville, Attn: Murray Fontes
Mesiti-Miller Engineering, Attn: Rodney Cahill, PE

GEOTECHNICAL INVESTIGATION

LEE ROAD TRAIL
WATSONVILLE, CALIFORNIA

FOR
MME
SANTA CRUZ, CALIFORNIA

Pacific Crest
ENGINEERING INC

CONSULTING GEOTECHNICAL ENGINEERS

1922-SZ81-C41
REVISED SEPTEMBER 2020
www.4pacific-crest.com

(Revised) September 4, 2020 Project No. 1922-SZ81-C41

Mr. Dale Hendsbee, Principal
MME
224 Walnut Avenue, Suite B
Santa Cruz, CA 95060

Subject: **Geotechnical Investigation – Design Phase**
Lee Road Trail
Watsonville, California

Dear Mr. Hendsbee,

In accordance with your authorization, we have completed our geotechnical investigation for the proposed Lee Road Trail located on Lee Road in Watsonville, California. *This revision to our December 20, 2019 report has been prepared to present additional retaining wall and grading recommendations, as well as updated seismic design values as prescribed by the 2019 California Building Code. This revised report replaces our December 20, 2019 report in its entirety.*

The water surface elevation in Struve Slough remained well above Lee Road during the entire course of our investigation so we were unable to perform subsurface exploration in this area using conventional drilling equipment. We recommend further CPT testing at proposed pile locations within the slough in order to fully develop geotechnical design recommendations for design of the proposed pedestrian bridge. Since it now appears likely that Lee Road remains submerged year round, overwater equipment will be required to complete this testing.

The accompanying report presents our conclusions and recommendations as well as the results of the geotechnical investigation on which they are based. The conclusions and recommendations presented in this report are contingent upon our review of the plans during the design phase of the project, and our observation and testing during the construction phase of the project.

We appreciate the opportunity to be of service. If you have any questions concerning the information presented in this report, please call our office.

Very truly yours,

PACIFIC CREST ENGINEERING INC.

Elizabeth Mae Mitchell

REGISTERED PROFESSIONAL ENGINEER
ELIZABETH MAE MITCHELL
GE2718
Exp. 12/31/20
GEOTECHNICAL
STATE OF CALIFORNIA

Elizabeth M. Mitchell, GE
President/Principal Geotechnical Engineer
GE 2718, Expires 12/31/20

Copies: 2 to Client

TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION REPORT
Lee Road Trail, Watsonville, California

I. INTRODUCTION

PURPOSE AND SCOPE

This report describes the geotechnical investigation and presents our conclusions and recommendations for the proposed Lee Road Trail located on Lee Road, in Watsonville, California. For purposes of this report "site" refers to the 1.2-mile-long area of the proposed Trail alignment extending along Lee Road between the railroad crossing north of Beach Street to Harkins Slough Road.

Our scope of services for this project has consisted of:

1. Site reconnaissance to observe the existing conditions.

2. Review of the following published maps:
   - Geologic Map of Santa Cruz County, California, Brabb, 1997.
   - Preliminary Map of Landslide Deposits in Santa Cruz County, California, Cooper-Clark and Associates, 1975.
   - Map Showing Geology and Liquefaction Potential of Quaternary Deposits in Santa Cruz County, California, Dupré, 1975.
   - Map Showing Faults and Their Potential Hazards in Santa Cruz County, California, Hall, Sarna-Wojcicki, Dupré, 1974.
   - U.S. Geological Survey (and the California Geologic Survey), 2018, Quaternary fault and fold database for the United States, accessed July 2018, from USGS web site: http//earthquake.usgs.gov/hazards/qfaults/.

3. The drilling and logging of 6 test borings and one Cone Penetrometer Test (CPT) sounding.

4. Laboratory analysis of retrieved soil samples.

5. Engineering analysis of the field and laboratory test results.

6. Preparation of this report documenting our investigation and presenting geotechnical recommendations for the design and construction of the project.

PROJECT LOCATION

The proposed trail segment will connect to the proposed Lee Road Rail Trail at the south end, extending north along Lee Road to Harkins Slough Road. Please refer to the Regional Site Map, Figure No. 1, in Appendix A for the general vicinity of the project site, which is approximately located by the following coordinates:

Latitude = 36.903963 degrees
Longitude = -121.783762 degrees

PROPOSED IMPROVEMENTS

Based on our review of preliminary plans and discussions with MME, it is our understanding that the proposed trail segment will connect to the Lee Road Rail Trail at the south end, extending north along Lee Road to Harkins Slough Road. The proposed Trail includes approximately 1.2 miles of a multi-use asphalt, pervious concrete and/or decomposed granite pathway and will include a pedestrian bridge spanning Struve Slough.

Along the northern segment, the proposed trail is bounded by farms to the west and an ecological preserve to the east. Struve Slough and industrial sites flank the southern portion of the segment.

It is our understanding that the trail section will be eight to twelve feet in width and flanked on both sides by 2-foot wide gravel shoulders. Grading is expected to include minor cuts and fills along with retaining walls ranging from about 3 to 8 feet in height.

II. INVESTIGATION METHODS

FIELD INVESTIGATION

Soil Borings

Six, 6-inch diameter test borings were drilled at the site on April 8 and May 2, 2019. The approximate location of the test borings is shown on Figure No. 2, in Appendix A. The drilling method used was hydraulically operated continuous flight augers on a truck mounted drill rig. A geologist from Pacific Crest Engineering Inc. was present during the drilling operations to log the soil encountered and to choose sampler type and locations.

Relatively undisturbed soil samples were obtained at various depths by driving a split spoon sampler 18 inches into the ground. This was achieved by dropping a 140 pound hammer a vertical height of 30 inches. The hammer was actuated with a wire winch. The number of blows required to drive the sampler each 6-inch increment and the total number of blows required to drive the last 12 inches was recorded by the field engineer. The outside diameter of the samplers used was 3-inch or 2-inch and is designated on the Boring Logs as “L” or “T”, respectively.

The field blow counts in 6-inch increments are reported on the Boring Logs adjacent to each sample as well as the Standard Penetration Test data (SPT). All STP data has been normalized to a 2-inch O.D. sampler and is reported on the Boring Logs as SPT "N" values. The normalization method used was derived from the second edition of the Foundation Engineering Handbook (H.Y. Fang, 1991). The method utilizes a Sampler Hammer Ratio which is dependent on the weight of the hammer, height of hammer drop, outside diameter of sampler, and inside diameter of sample.

The soils encountered in the borings were continuously logged in the field and visually described in accordance with the Unified Soil Classification System (ASTM D2488) as described in the Boring Log Explanation, Figures No. 3 and 4, in Appendix A. The soil classification was verified upon completion of laboratory testing in accordance with ASTM D2487.

Cone Penetrometer Testing

One (1) cone penetrometer test (CPT) sounding was advanced at the southern edge of Struve Slough on November 12, 2019. A staff geologist from Pacific Crest Engineering Inc. was present to supervise the field operations. The sounding was performed in accordance with the ASTM D5778 test method. The location of the CPT sounding is shown on Figure No. 2 of Appendix A.

The CPT sounding was advanced using a 15 cm^2 piezocone penetrometer with a friction sleeve. A saturated piezo element is placed between the cone and the friction sleeve to obtain dynamic pore pressure parameters. Continuous measurements were made of the tip resistance, the friction sleeve resistance, and the dynamic pore pressure as the cone was pushed into the ground. Real time data along with correlations between these measurements and soil properties were observed as the probe was advanced so that our engineer and/or geologist could determine the depth of soundings required. In this case the sounding was advanced to refusal at a depth of 75.95 feet below the road surface.

Appendix A contains the site plan showing the locations of the test borings, boring logs and an explanation of the soil classification system used. Stratification lines on the boring logs are approximate as the actual transition between soil types may be gradual. The CPT plots with interpreted soil types is included behind the boring logs in Appendix A.

LABORATORY TESTING

The laboratory testing program was developed to aid in evaluating the engineering properties of the materials encountered at the site. Laboratory tests performed include:

- Moisture Density relationships in accordance with ASTM D2937.
- Field penetrometer testing to approximate unconfined compressive strength.
- Gradation testing in accordance with ASTM D1140.
- Atterberg Limits testing in accordance with ASTM D4318.
- Unconfined Compression testing in accordance with ASTM D2166.
- Direct Shear testing in accordance with ASTM D3080.
- Organic Content Test in accordance with ASTM D2974 Method C.

The results of the laboratory testing are presented on the boring logs opposite the sample tested and/or presented graphically in Appendix A.

III. FINDINGS AND ANALYSIS

GEOLOGIC SETTING

The Lee Road Trail alignment transects two distinctive geologic units. The portion of Trail north of Struve Slough is mapped on the USGS Geologic Map of Santa Cruz County (Brabb 1997) as Terrace

Deposits (Qt). The remaining portion of the trail segment (including Struve Slough and Lee Road to the south) is mapped as being underlain by Basin Deposits (Qb).

The Terrace Deposits are described as weakly consolidated to semi-consolidated heterogeneous deposits of moderately to poorly-sorted silt, silty clay, sand and gravel. Basin Deposits typically consist of unconsolidated, plastic clay and silty clay that is rich in organic materials, and can locally contain thin interbedded layers of silt and silty sand. The Basin Deposits were deposited in a variety of environments including estuaries, lagoons, marsh filled sloughs, flood basins and lakes, and are mapped as having a very high potential for liquefaction (Dupre', 1975; Dupre' and Tinsley, 1980). The soils encountered during our field investigation are consistent with these descriptions.

SURFACE CONDITIONS

The subject portion of the proposed Lee Road Trail is located on both sides of Struve Slough and is flanked by industrial buildings on the southern portion and agricultural areas and ecological reserve areas on the northern portion. Lee Road traverses the entire area, and is inundated by water within the slough for the majority of the year. The portion of roadway at the south side of Struve Slough is overgrown with brush. Beyond the slough margins the proposed Trail alignment is relatively flat with gently sloping hills on the trail portion north of Struve Slough.

SUBSURFACE CONDITIONS

Our subsurface exploration included six (6) small diameter borings; two of which were drilled as close to the slough edge as was practically possible. Four borings were advanced at accessible intervals along the proposed trail alignment. The borings extended 11½ to 51½ feet below existing grade.

The following briefly describes the general subsurface soil conditions encountered within the test borings. The Logs of Test Borings in Appendix A provide, in more descriptive terms, the soil profiles and classifications, laboratory test results and groundwater conditions encountered at each boring location.

Basin Deposits – CPT-1, Boring B-1, B-2 and B-3

Boring B-1, B-2 and CPT-1 were advanced near the south side of Struve Slough. Consistent with what we infer to be Basin Deposit materials, both borings and the CPT sounding encountered predominately intermediate to high plasticity clay and silt soils with interbedded silty and clayey sands. Intermediate to high plasticity characteristics are indicative of expansive soils. The consistency of the fine-grained materials in the borings were generally stiff to very stiff, although a soft layer of sandy elastic silt was noted between about 3 to 5 feet in B-1. The density of the sand layers were described as medium. CPT-1, which was located right at the water's edge (approximately Station 8+45) at the south side of the slough, noted up to 30 feet of soft to very soft clay, silt, and organic materials.

Boring B-3 was drilled along the northern margin of the slough, as close to the water as we could access with our drilling equipment. In this boring we also encountered what we infer to be Basin Deposit materials comprised of about three feet of stiff sandy lean clay overlying soft, highly organic peat at a depth of approximately 5 to 20 feet below the ground surface. The peat soils are underlain by approximately 20 feet of stiff clay with varying sand content. At a depth of about 40 feet we encountered poorly graded, medium dense to very dense sand that continued to the maximum explored depth of 51½ feet.

Based on the materials encountered as well as a review of soil borings at the Highway One Bridge site, it should be expected that the thickness of the soft clay and/or peat soils will vary across the slough. This should be verified by CPT testing at proposed pile locations within the slough crossing, but for preliminary planning purposes we have estimated the thickness of soft clay/organic soils could be in excess of 50 feet.

All three borings encountered predominately coarse-grained man-made fill soils with varying gravel content within the upper 2½ feet. The density of these materials were described as loose to medium dense. Those borings advanced within the road pavement encountered 3 to 10 inches of asphalt underlain by varying thickness of aggregate base or fill subgrade.

Terrace Deposits – Borings B-4, B-5 and B-6

Borings B-4, B-5 and b-6 were drilled along the northern segment of the proposed trail alignment. Consistent with what we infer to be Terrace Deposit materials, the boring profiles were comprised of predominately sandy soils with interbeds of sandy clay to the depths explored. The sand materials were generally medium dense to dense. The fine-grained clay soils were typically very stiff and possessed intermediate to high plasticity characteristics. Intermediate to high plasticity characteristics are indicative of expansive soils.

Groundwater Conditions

Groundwater was encountered within B-1 at an approximate depth of 15 feet. Surface water was observed approximately 1 foot below the road surface at B-3. The phreatic surface within CPT-1 was noted to be about 9 feet below the road surface. No ground water was encountered within the other four borings. It should be noted that the groundwater level was not allowed to stabilize for more than a few hours; therefore, the actual groundwater level may be higher or lower than initially encountered. The groundwater conditions described in this report reflect the conditions encountered during our drilling investigation in April and May of 2019 at the specific locations drilled. It must be anticipated that the perched and regional groundwater tables may vary with location and could fluctuate with variations in rainfall, runoff, irrigation and other changes to the conditions existing at the time our measurements were made. It should be anticipated that the groundwater table may rise significantly in the winter of non-drought years, and is likely to be influenced by water levels in the slough.

FAULTING AND SEISMICITY

Faulting

Mapped faults which have the potential to generate earthquakes that could significantly affect the subject site are listed in Table No. 1. The fault distances are approximate distances based the U.S.

Geological Survey and California Geological Survey, Quaternary fault and fold database, accessed in July of 2018 from the USGS website (http//earthquake.usgs.gov/hazards/qfaults/) and overlaid onto Google Earth.

Table No. 1 - Distance to Significant Faults

Fault Name	Distance (miles)	Direction
Zayante-Vergeles	3	Northeast
San Andreas	6½	Northeast
Sargent	9	Northeast
Berrocal	10	Northeast
Monterey Bay-Tularcitos	12	Southeast

Seismic Shaking and CBC Design Parameters

Due to the proximity of the site to active and potentially active faults, it is reasonable to assume the site will experience high intensity ground shaking during the lifetime of the project. Structures founded on thick soft soil deposits are more likely to experience more destructive shaking, with higher amplitude and lower frequency, than structures founded on bedrock. Generally, shaking will be more intense closer to earthquake epicenters. Thick soft soil deposits large distances from earthquake epicenters, however, may result in seismic accelerations significantly greater than expected in bedrock.

The Basin Deposit materials underlying the proposed bridge site are liquefiable, resulting in a Site Class F designation. In accordance with Chapter 11 of ASCE 7-16, site-specific ground motion response procedures are required for Site Class F soils for structures with a fundamental period of vibration greater than 0.5 seconds. It is our understanding that the fundamental period of vibration for the proposed pedestrian bridge is expected to exceed 0.5 seconds. Therefore a site-specific ground motion response analysis will be required to determine spectral acceleration values for the bridge structure and are specifically excluded from this report. This work is expected to be performed as part of the 90% design phase and the resulting seismic design values for the bridge structure will be presented in a future addendum report.

The tables below provide 2019 CBC seismic parameters for both Site Class E and Site Class D conditions. Site Class E conditions should be considered for the southern portion of the trail segment (excluding Struve Slough). Site Class D conditions are considered applicable for the northern trail segment including Harkins Slough Road and Lee Road to Struve Slough (also excluding Struve Slough).

Selection of seismic design parameters should be determined by the project Structural Engineer. The site coefficients and seismic ground motion values shown in the table below were developed based on CBC 2019 incorporating the ASCE 7-16 standard, and the project site location.

Table No. 2A – Struve Slough (Pedestrian Bridge Site)
2019 CBC Seismic Design Parameters

Seismic Design Parameter	ASCE 7-16 Value
Site Class	F
Site Specific Ground Motion Response Analysis Required	Not Applicable

Table 2B - Southern Trail Segment (Excluding Struve Slough)
2019 CBC Seismic Design Parameters Note 1

Seismic Design Parameter	ASCE 7-16 Value
Site Class	E Note 2
Spectral Acceleration for Short Periods	S_S = 2.308g
Spectral Acceleration for 1-second Period	S_1 = 0.872g
Short Period Site Coefficient, F_a	**Note 3**
1-Second Period Site Coefficient, F_v	**Note 4**
MCE Spectral Response Acceleration for Short Period, S_{MS}	**Note 3**
MCE Spectral Response Acceleration for 1-Second Period, S_{M1}	**Note 4**
Design Spectral Response Acceleration for Short Period, S_{DS}	**Note 3**
Design Spectral Response Acceleration for 1-Second Period, S_{D1}	**Note 4**

Note 1: Design values have been obtained by using the ASCE Hazard Tool at https://asce7hazardtool.online

Note 2: The site would normally be assigned Site Class F because the Basin Deposit soils are potentially liquefiable, resulting in a Site Class F designation. Section 20.3.1 of ASCE 7-16 allows the following exception for structures overlying Site Class F soil: "*For structures having fundamental periods of vibration equal to or less than 0.5 seconds, site response analysis is not required to determine spectral accelerations for liquefiable soils. Rather, a site class is permitted to be determined in accordance with Section 20.3 and the corresponding values of Fa and Fv determined from Section 11.4 of ASCE 7-16.* The seismic design parameters for Site Class E may be assumed only for structures with a fundamental period of vibration equal to or less than 0.5 seconds. **This must be verified by the project Structural Engineer. Structures on Site Class F soils with a fundamental period of vibration greater than 0.5 seconds, including the proposed pedestrian bridge, will require supplemental design criteria and a site-response analysis as discussed above.**

Note 3: Per Section 11.4.8 of ASCE 7-16, a ground motion hazard analysis (GMHA) is required for Site Class E sites with S_S greater than or equal to 1.0. Section 11.4.8 of ASCE 7-16 provides an Exception to the GMHA requirement for certain structures. For Site Class E sites, Exception 1 of Section 11.4.8 allows the short period site coefficient F_a to be determined from Table 11.4.1 for Site Class C. Initiating Exception 1 for structural design would result a short period site coefficient of F_a =1.2 and corresponding MCE and Design Spectral Response Acceleration values of S_{MS}= 2.770 and S_{DS} = 1.864, respectively. These values cannot be used for seismically isolated structures or structures with damping systems, and assume that Exception 1 of Section 11.4.8 is therefore applicable. This should be verified by the Structural Engineer. Pacific Crest Engineering, Inc. should be contacted for site specific GMHA parameters if the Exception is not employed or applicable for structural design.

Note 4: Per Section 11.4.8 of ASCE 7-16, a ground motion hazard analysis is required for Site Class E sites with S_1 greater than or equal to 0.2. Exception 3 of Section 11.4.8 of ASCE 7-16 allows the site coefficient Fv and spectral acceleration parameters S_{M1} and S_{D1} to be determined from Section 11.4 provided that: (1) this is not a seismically isolated structure or a structure with damping systems, (2) F_v can be obtained from Table 1613.2.3(2) of the 2019

CBC, and (3) Exception 3 of Section 11.4.8 is applicable (i.e., the fundamental period of the structure T is less than or equal to Ts (as defined in Section 11.4.6.4 of ASCE 7-16) and equivalent static force procedure is used for design. Initiating Exception 3 for structural design will result in a 1-second period site coefficient of F_1 = 2.0 and corresponding MCE and Design Spectral Response Acceleration values of S_{M1} = 1.744 and S_{D1} = 1.163, respectively. This should be verified by the Structural Engineer. Pacific Crest Engineering, Inc. should be contacted for site specific GMHA parameters if the Exception is not employed or applicable for structural design.

Table No. 2C – Lee Road From Harkins Slough Road South to Struve Slough (<u>Excluding Struve Slough</u>)
2019 CBC Seismic Design Parameters Note 1

Seismic Design Parameter	ASCE 7-16 Value
Site Class	D
Spectral Acceleration for Short Periods	S_s = 2.308 g
Spectral Acceleration for 1-second Period	S_1 = 0.872 g
Short Period Site Coefficient, F_a	Fa = 1.0
1-Second Period Site Coefficient, F_v	**Note 2**
MCE Spectral Response Acceleration for Short Period, S_{MS}	S_{MS} = 2.308 g
MCE Spectral Response Acceleration for 1-Second Period, S_{M1}	**Note 2**
Design Spectral Response Acceleration for Short Period, S_{DS}	S_{DS} = 1.539 g
Design Spectral Response Acceleration for 1-Second Period, S_{D1}	**Note 2**

Note 1: Design values have been obtained by using the ASCE Hazard Tool at https://asce7hazardtool.online

Note 2: Per Section 11.4.8 of ASCE 7-16, a ground motion hazard analysis is required for Site Class D sites with S_1 greater than or equal to 0.2. Exception 2 of Section 11.4.8 of ASCE 7-16 allows the site coefficient Fv and spectral acceleration parameters S_{M1} and S_{D1} to be determined from Section 11.4 provided that the seismic response coefficient Cs is determined from Section 12.8 as detailed in Section 11.4.8. Initiating Exception 2 for structural design will result in a 1-second period site coefficient of F_1 = 2.0 and corresponding MCE and Design Spectral Response Acceleration values of S_{M1} = 1.744 and S_{D1} = 1.163, respectively. This should be verified by the Structural Engineer. Pacific Crest Engineering, Inc. should be contacted for site specific GMHA parameters if the Exception is not employed or applicable for structural design.

The recommendations of this report are intended to reduce the potential for structural damage to an acceptable risk level, however strong seismic shaking could result in architectural damage and the need for post-earthquake repairs. It should be assumed that exterior improvements such as pavements, slabs or sidewalks may need to be repaired or replaced following strong seismic shaking.

<u>GEOTECHNICAL HAZARDS</u>

Based on the results of our investigation, geotechnical hazards associated with the project site include seismic shaking (discussed above), ground surface fault rupture, liquefaction, lateral spreading, landsliding and expansive soils. A discussion of these hazards is presented below.

Ground Surface Fault Rupture

A specific investigation for the presence of active faults at the project site was beyond our scope of services and was not performed. Based upon our review of the Santa Cruz County GIS Hazard Maps, the project site is not mapped within a fault hazard zone.

Ground surface fault rupture typically occurs along the surficial traces of active faults during significant seismic events. Since the nearest known active, or potentially active fault trace is mapped approximately 3 miles from the site, it is our opinion that the potential for ground surface fault rupture to occur at the site should be considered low.

Liquefaction and Lateral Spreading

Liquefaction tends to occur in loose, saturated and fine grained cohesionless sands, coarse silts or clays with a low plasticity. In order for liquefaction to occur there must be the proper soil type, soil saturation, and cyclic accelerations of sufficient magnitude to progressively increase the water pressures within the soil mass. Non-cohesive soil shear strength is developed by the point to point contact of the soil grains. As the water pressures increase in the void spaces surrounding the soil grains the soil particles become supported more by the water than the point to point contact. When the water pressures increase sufficiently, the soil grains begin to lose contact with each other resulting in the loss of shear strength and continuous deformation of the soil where the soil appears to liquefy.

Our review of the Santa Cruz County GIS Hazard Maps indicates the Basin Deposits (which includes the proposed bridge site and Trail segment to the south) are mapped with a “very high” susceptibility for liquefaction. The Highway 1 Struve Slough Bridge, located approximately 1000 feet north of the proposed Lee Road Trail, collapsed during the 1989 Loma Prieta earthquake due to massive lateral displacement of soft foundation soils within the slough.

Substantial advances in liquefaction engineering have occurred over the past 15 years. Liquefaction science has expanded to examine strength loss of low plasticity silts and clays during cyclic earthquake shaking. Bray and Sancio (2006) suggested that fine grained soils meeting the following criteria should also be considered liquefiable:

- Silts and clayey silts with low plasticity (PI < 12) and a high-water content to liquid limit ratio (W_c/LL > 0.85).
- Clayey silts and silty clays of moderate plasticity (12 < PI < 18) and a moderate water content to liquid limit ratio of (W_c/LL > 0.80).
- Sensitive soils with plasticity indices in excess of 18 may also be liquefiable. Engineering judgment should be used in these cases.

As part of our preliminary liquefaction analysis, we screened our laboratory data for liquefaction susceptibility of fine grained materials as defined above. The following table presents the results of this initial screening process.

Table No. 3 – Liquefaction Screening – Fine Grained Soils

Soil Type	Avg. Moisture Content, W_c (%)	Liquid Limit, LL	Plasticity Index, PI	W_c/LL	Susceptible to Liquefaction
Sandy Elastic Silt	17.4	60	29	0.8	No
Sandy Lean Clay	10.8	23	16	1.2	Yes
Sandy Fat Clay	31.6	--	--	--	No
Sandy Lean Clay	22.9	46	28	1.2	No
Silt	33.0	38	12	0.9	Yes
Sandy Silt	30.5	37	12	0.8	Yes
Fat Clay	33.8	53	30	0.7	No

Using the data presented above and subsurface data from Borings B-1, B-3 and CPT-1 we performed quantitative analysis of liquefaction potential along the proposed bridge route crossing Struve Slough. Our analysis utilized the software program CLIQ 2.2.0.28 and LiqSVs 1.2.1.6 by Geologismiki, which is based upon the most recent recommendations of the NCEER Workshop and SP117 implementation. Please refer to Appendix B for the results and related graphics summarizing our analysis.

Based on an estimated mean peak ground acceleration (PGA_M) of 0.63g resulting from a 7.9 magnitude (M) earthquake, our preliminary estimates indicate seismically induced settlement on the order of 4 to 6 inches within the bridge crossing. **This analysis is based on subsurface data obtained from the edges of the slough. It is likely that the composition of Basin Deposit materials could vary significantly between the edges and center of the slough. Supplemental CPT soundings are recommended at the proposed pile locations within the slough in order to more fully characterize the liquefaction potential across the bridge site.**

Liquefaction induced lateral spreading occurs when a liquefied soil mass fails toward an open slope face, or fails on an inclined topographic slope. Our analysis indicates that the site has a high potential for liquefaction, consequently the potential for lateral spreading is also considered high. It is currently estimated that lateral displacements on the order of 30 inches could occur within sloping areas area of the trail segment underlain by Basin Deposits.

Landsliding

The proposed trail alignment will be situated within areas of relatively level to gently sloping topography and there are no mapped landslide hazards within the proposed trail route. Provided our recommendations are closely followed during the design and construction of the project, it our opinion that deep seated landsliding is a hazard with negligible potential for affecting the proposed project. We caution however, that those portions of the pathway within sloping areas can become undermined if surface runoff is not adequately controlled.

Expansive Soils

The proposed trail route is underlain by varying layers of moderate to highly expansive clay. Expansive soils tend to heave during the rainy season and contract during the summer and this shrink/swell action extends down to the depth of seasonal moisture change. When this cyclical volume change occurs on sloping ground it results in “soil creep” due to the downward vector of the shrink/swell action. Seasonal moisture fluctuation and subsequent expansion and contraction of these types of soils typically occurs more near the ground surface where the seasonal moisture fluctuation is the greatest and decreases with depth below ground surface.

DISCUSSION AND CONCLUSIONS

GENERAL

1. The water surface elevation in Struve Slough was several feet above Lee Road during the entire course of our investigation so we were unable to perform subsurface exploration in this area using conventional drilling equipment. We recommend further CPT testing at proposed pile locations within the slough in order to more fully develop geotechnical design recommendations for the proposed pedestrian bridge. Since it now appears likely that Lee Road remains submerged year round, overwater equipment will be required to complete this testing.

2. The results of our investigation indicate that the proposed development is feasible from a geotechnical engineering standpoint, provided our recommendations are included in the design and construction of the project.

3. Grading and foundation plans should be reviewed by Pacific Crest Engineering Inc. during their preparation and prior to contract bidding.

4. Pacific Crest Engineering Inc. should be notified at least four (4) working days prior to any site clearing and grading operations on the property in order to observe the stripping and disposal of unsuitable materials, and to coordinate this work with the grading contractor. During this period, a pre-construction conference should be held on the site, with at least the client or their representative, the grading contractor, a County representative and one of our engineers present. At this meeting, the project specifications and the testing and inspection responsibilities will be outlined and discussed.

5. Field observation and testing must be provided by a representative of Pacific Crest Engineering Inc., to enable them to form an opinion as to the degree of conformance of the exposed site conditions to those foreseen in this report, the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the specification requirements. Any work related to grading or foundation excavation that is performed without the full knowledge and direct observation of Pacific Crest Engineering Inc., the Geotechnical Engineer of Record, will render the recommendations of this report invalid, unless the Client hires a new Geotechnical Engineer who agrees to take over complete responsibility for this report’s findings, conclusions and recommendations. The new Geotechnical Engineer must agree to prepare a Transfer of Responsibility letter. This may require additional test borings and laboratory analysis if the new

Geotechnical Engineer does not completely agree with our prior findings, conclusions and recommendations.

PRIMARY GEOTECHNICAL CONSIDERATIONS

6. Based upon the results of our investigation, it is our opinion that the primary geotechnical issues associated with the design and construction of the proposed project are the following:

a. *Liquefaction/Seismically Induced Settlement:* The Basin Deposit materials underlying Struve Slough and trail segments to the south are mapped as very highly liquefiable. In our opinion the primary geotechnical hazard affecting this portion of the project area is the potential for liquefaction and lateral spreading of the subsurface soils during a strong seismic event. Those portions of the Trail traversing the Basin Deposits may be subject to settlement during strong seismic shaking, requiring repair or replacement of portions of the Trail. Preliminary estimates indicate total ground surface settlements on the order of 4 to 6 inches within the proposed bridge crossing, and 2 to 4 inches for trail segments south of the slough. Differential settlement should be assumed to be highly differential, with a magnitude of ⅔ to ¾ of total settlement values. Bridge structures should be supported by pile foundations.

   As discussed previously, it is likely that the composition of Basin Deposit materials could vary significantly between the edges and center of the slough. Supplemental CPT soundings are recommended at the proposed pile locations within the slough in order to more fully characterize the subsurface conditions and liquefaction potential across the bridge site.

b. *Strong Seismic Shaking:* The project site is located within a seismically active area and strong seismic shaking is expected to occur within the design lifetime of the project. Improvements should be designed and constructed in accordance with the most current CBC and the recommendations of this report to minimize reaction to seismic shaking. Structures built in accordance with the latest edition of the California Building Code have an increased potential for experiencing relatively minor damage which should be repairable, however strong seismic shaking could result in architectural damage and the need for post-earthquake repairs.

c. *Divergent Bearing Conditions and Differential Settlement:* The bridge site is underlain by soft and compressible Basin Deposit materials of varying thickness. The upper soils within the Trail route varied from firm to stiff clays and loose to medium dense sand. Man-made fill was encountered in all but one boring. These divergent bearing conditions can result in differential settlement, which could adversely affect proposed structures planned for the alignment and lead to undesirable effects on pavement or pathway surfaces. Subgrade and baserock sections should be adequately compacted in accordance with the recommendations of this report. A pile foundation is recommended for the bridge structure. All other structural foundations, if applicable, should be underlain by a uniform zone of compacted engineered fill.

d. *Expansive Soils*: The native clay soils underlying the proposed improvements are moderately to highly expansive. Seasonal shrinking and swelling of these soils could result in heave or settlement and damage to improvements. To reduce this potential we recommend that pavements and structural foundations bear upon non-expansive engineered fill. Refer to the Subgrade Preparation section of this report for details.

e. *The Presence of Mature Trees:* Large trees are located in the proposed trail area near Boring B-2, and large tree roots and organically laden soils were encountered at depths of 1½ to 4½ feet within the test borings. Consequently, we anticipate that a significant number of large roots, root balls and/or organically laden soil will be encountered during the excavation process for this section of the proposed trail. These materials should be completely removed from the excavated area and should not be used as engineered fill.

IV. RECOMMENDATIONS

EARTHWORK

Clearing and Stripping

1. The initial preparation of the site may consist of demolition of portions of any existing structures and their foundations, and removal of designated trees and debris. All foundation elements from existing structures must be completely removed from improvement areas. Tree removal should include the entire stump and root ball. Septic tanks and leaching lines, if found, must be completely removed. The extent of this soil removal will be designated by a representative of Pacific Crest Engineering Inc. in the field. This material must be removed from the site.

2. Any voids created by the removal of old structures and their foundations, tree and root balls, septic tanks, and leach lines must be backfilled with properly compacted engineered fill which meets the requirements of this report.

3. Any wells encountered shall be capped in accordance with the requirements and approval of the County Health Department. The strength of the cap shall be equal to the adjacent soil and shall not be located within 5 feet of a structural footing.

4. Surface vegetation, tree roots and organically contaminated topsoil should then be removed ("stripped") from the area to be graded. In addition, any remaining debris or large rocks must also be removed (this includes asphalt or rocks greater than 2 inches in greatest dimension). This material may be stockpiled for future landscaping.

5. It is anticipated that the depth of stripping may be 2 to 4 inches. Final required depth of stripping must be based upon visual observations by a representative of Pacific Crest Engineering Inc., in the field. The required depth of stripping will vary based upon the type and density of vegetation across the project site and with the time of year.

Subgrade Preparation

6. Approximately 2 to 3 feet of non-engineered fill was encountered in most of our borings. We anticipate there will be other areas of man-made fill on the site that were not detected during our field investigation. Areas of man-made fill encountered on the project site, where such soils underlie structural foundations, vehicular pavement sections or retaining wall footings, will need to be completely excavated to undisturbed native material. Where man-made fill is encountered within other (non-structural) trail sections, complete removal may not be necessary if the fill can be bridged and/or stabilized with fabric. Any excavation process should be observed and the extent designated by a representative of Pacific Crest Engineering Inc., in the field.

7. Any voids or excavations created by fill removal must be backfilled with properly compacted non-expansive native soils that are free of organic and other deleterious materials, or with approved imported fill.

8. Following clearing and stripping and any required subgrade preparation as described above, the exposed soils in pavement and/or pathway areas should be removed to a minimum depth of 8 inches below finished subgrade or as designated by a representative of Pacific Crest Engineering Inc. Areas to support concrete pavements, structural foundations and retaining walls should be subexcavated a minimum of 12 inches below finished subgrade or bottom of footing, whichever is greater. The base of the excavation must be observed and approved by a representative of Pacific Crest Engineering prior to backfilling. The approved base of the excavation should be scarified to a minimum depth of 6 inches, moisture conditioned and compacted. Approved excavated soil may then be replaced in maximum 8 inch lifts (before compaction). This should result in a minimum of 12 inches of compacted subgrade below pavement/pathway areas, and 18 inches of engineered fill below concrete slabs (including pervious concrete), structural foundations or retaining wall footings.

9. Recompacted sections should extend 2 feet horizontally beyond the pavement perimeter, and 3 feet beyond concrete slabs and retaining wall foundations.

10. Wet and/or soft soils will likely be encountered at bottom of excavation within varying segments of the Trail. If wet or unstable subgrades are encountered they may need to further subexcavated and replaced with stabilization fabric, crushed rock or other materials to create a stable working surface. The depth of over-excavations and stabilization methods to be used should be determined in the field at the time of construction. All subexcavations should be observed by a representative of Pacific Crest Engineering Inc. and modified as necessary to establish a stable subgrade.

Material for Engineered Fill

11. Native soils to be used as engineered fill should be limited to the predominately granular materials i.e., silty to clayey sand and sandy silt, encountered along Lee Road north of Struve Slough (B4 and B6). Expansive clay soils that underlie most of the remaining portions of Trail segment should not be used as engineered fill without additional processing (lime treatment, blending, etc.)

12. Non-expansive native or imported soil proposed for use as engineered fill should meet the following requirements:

a. free of organics, debris, and other deleterious materials,
b. free of "recycled" materials such as asphaltic concrete, concrete, brick, etc.,
c. granular in nature, well graded, and contain sufficient binder to allow utility trenches to stand open,
d. free of rocks in excess of 2 inches in size.

In addition to the above requirements, import fill should have a Plasticity Index between 4 and 12, and a minimum Resistance "R" Value of 30, and be non-expansive.

13. Samples of any proposed imported fill planned for use on this project should be submitted to Pacific Crest Engineering Inc. for appropriate testing and approval not less than ten (10) working days before the anticipated jobsite delivery. This includes proposed import trench sand, drain rock and for aggregate base materials. Imported fill material delivered to the project site without prior submittal of samples for appropriate testing and approval must be removed from the project site.

Engineered Fill Placement and Compaction

14. Following any necessary subexcavations and/or subgrade preparation, areas should be brought up to design grades with engineered fill that is moisture conditioned and compacted according to the recommendations of this report. This should result in a minimum of 12 inches of compacted subgrade below pavement sections, and 18 inches of engineered fill beneath concrete slabs or retaining wall footings. Recompacted sections should extend at least 3 feet horizontally beyond all footings, slabs and 2 feet beyond the edges of pavements, where possible.

15. Due to the expansive nature of the on-site soils, the native soils must not be used as engineered fill directly beneath new footings or slabs. We recommend the upper 12 inches of engineered fill beneath all new footings and concrete slab-on-grade consist of non-expansive material.

16. Engineered fill should be placed in maximum 8-inch lifts, before compaction, at a water content which is within 1 to 3 percent of the laboratory optimum value. Expansive subgrade soils should be moisture conditioned to between 3 to 5 percent of laboratory optimum.

17. All engineered fill should be compacted to a minimum of 90% of its maximum dry density. The upper 8 inches of the soil subgrade in vehicle pavement areas, and all aggregate subbase and aggregate base should be compacted to a minimum of 95% of its maximum dry density.

18. The maximum dry density will be obtained from a laboratory compaction curve run in accordance with ASTM Procedure #D1557. This test will also establish the optimum moisture content of the material. Field density testing will be performed in accordance with ASTM Test #D6938 (nuclear method).

Cut and Fill Slopes

19. Fill slopes should be constructed with engineered fill meeting the minimum density requirements of this report and have a gradient no steeper than 2:1 (H:V). Fill slopes should not exceed 15 feet in vertical height unless specifically reviewed by Pacific Crest Engineering Inc. Where the vertical height exceeds 15 feet, intermediate benches must be provided. These benches should be at least 6 feet wide and sloped to control surface drainage. A lined ditch should be used on the bench.

20. Engineered fill slopes with gradients steeper than or equal to 4:1 (H:V) should be keyed and/or benched into competent native material. When the height of the fill slope (vertical distance between toe and top of fill) is greater than 4 feet, a minimum 10-foot-wide toe key with a 2% negatively sloping bottom should be constructed at the base of the fill slope. The depth of the keyways will vary, depending on the materials encountered; however, it is anticipated that the depth of the keyways may be 2 to 3 feet. Subsequent benches may be required as the fill section progresses upslope. When the height of the fill slope is less than or equal to 4 feet, a minimum 8-foot-wide bench with a 2% negatively sloping bottom should be constructed at the base of the fill slope. Benches and keys will be designated in the field by a representative of Pacific Crest Engineering Inc. See the attached Figure No. 22 for general keyway and bench details.

21. Permanent cut slopes in native soil shall not exceed a 3:1 (H:V) gradient. All cut slopes should not exceed a 15-foot vertical height unless specifically reviewed by a representative of Pacific Crest Engineering Inc. Where the vertical height exceeds 15 feet, intermediate benches must be provided. These benches should be at least 6 feet wide and sloped to control surface drainage. A lined ditch should be used on the bench.

22. The above slope gradients are based on the strength characteristics of the materials under conditions of normal moisture content that would result from rainfall falling directly on the slope, and do not consider the additional activating forces applied by seepage from spring areas or subsurface groundwater. Therefore, in order to maintain stable slopes at the recommended gradients, it is important that any seepage forces and accompanying hydrostatic pressure (if encountered) be relieved by adequate drainage. Drainage facilities may include subdrains, gravel blankets, rock fill surface trenches or horizontally drilled drains. Configurations and type of drainage will be determined by a representative of Pacific Crest Engineering Inc. during the grading operations.

23. The surfaces of all cut and fill slopes should be prepared and maintained to reduce erosion. This work, at a minimum, should include track rolling of the slope and effective planting. The protection of the slopes should be installed as soon as practicable so that a sufficient growth will be established prior to inclement weather conditions. It is vital that no slope be left standing through a winter season without the erosion control measures having been provided.

24. The above recommended gradients do not preclude periodic maintenance of the slopes, as minor sloughing and erosion may take place.

25. If a fill slope is to be placed above a cut slope, the toe of the fill slope should be set back at least 10 feet horizontally from the top of the cut slope. A lateral surface drain should be placed in the area between the cut and fill slopes.

26. All rigid improvements (i.e. foundations, flatwork, pavements, etc.) should be set back at least 5 feet horizontally from the top of cut and fill slopes.

Soil Moisture and Weather Conditions

27. If earthwork activities are done during or soon after the rainy season, the on-site soils and other materials may be too wet in their existing condition to be used as engineered fill. These materials may require a diligent and active drying and/or mixing operation to reduce the moisture content to the levels required to obtain adequate compaction as an engineered fill. If the on-site soils or other materials are too dry, water may need to be added. In some cases the time and effort to dry the on-site soil may be considered excessive, and the import of aggregate base may be required.

Utility Trench Backfill

28. Utility trenches that are parallel to the sides of the structural footings should be placed so that they do not extend below a line sloping down and away at a 2:1 (horizontal to vertical) slope from the bottom outside edge of all footings.

29. Utility pipes should be designed and constructed so that the top of pipe is a minimum of 24 inches below the finish subgrade elevation of any road or pavement areas. Any pipes within the top 24 inches of finish subgrade should be concrete encased, per design by the project civil engineer.

30. For the purpose of this section of the report, backfill is defined as material placed in a trench starting one foot above the pipe, and bedding is all material placed in a trench below the backfill.

31. Unless concrete bedding is required around utility pipes, free-draining clean sand should be used as bedding. Sand bedding should be compacted to at least 95 percent relative compaction. Clean sand is defined as 100 percent passing the #4 sieve, and less than 5 percent passing the #200 sieve.

32. Approved imported clean sand or native soil should be used as utility trench backfill. Backfill in trenches located under and adjacent to structural fill, foundations, concrete slabs and pavements should be placed in horizontal layers no more than 8 inches thick. This includes areas such as sidewalks, patios, and other hardscape areas. Each layer of trench backfill should be water conditioned and compacted to at least 95 percent relative compaction

33. All utility trenches beneath perimeter footings or grade beams should be backfilled with controlled density fill (such as 2-sack sand\cement slurry) to help minimize potential moisture intrusion below interior floors. The length of the plug should be at least three times the width of the footing or grade beam at the building perimeter, but not less than 36 inches. A representative from Pacific Crest Engineering Inc. should be contacted to observe the placement of slurry plugs. In addition, all utility

pipes which penetrate through the footings, stemwalls or grade beams (below the exterior soil grade) should also be sealed water-tight, as determined by the project civil engineer or architect.

34. Utility trenches which carry "nested" conduits (stacked vertically) should be backfilled with a control density fill (such as 2-sack sand\cement slurry) to an elevation one foot above the nested conduit stack. The use of pea gravel or clean sand as backfill within a zone of nested conduits is not recommended.

35. A representative from our firm should be present to observe the bottom of all trench excavations, prior to placement of utility pipes and conduits. In addition, we should observe the condition of the trench prior to placement of sand bedding, and to observe compaction of the sand bedding, in addition to any backfill planned above the bedding zone.

36. Jetting of the trench backfill is not recommended as it may result in an unsatisfactory degree of compaction.

37. Trenches must be shored as required by the local agency and the State of California Division of Industrial Safety construction safety orders.

Excavations and Shoring

38. Temporary shoring is not currently anticipated for this project. Should these requirements change, please contact our office for additional recommendations.

39. It should be understood that on-site safety is the *sole responsibility* of the Contractor, and that the Contractor shall designate a *competent person* (as defined by CAL-OSHA) to monitor the slope excavation prior to the start of each work day, and throughout the work day as conditions change. The competent person designated by the Contractor shall determine if flatter slope gradients are more appropriate, or if shoring should be installed to protect workers in the vicinity of the slope excavation. Refer to Title 8, California Code of Regulations, Sections 1539-1543.

40. All excavations must meet the requirements of 29 CFR 1926.651 and 1926.652 or comparable OSHA approved state plan requirements.

41. The "top" of any temporary cut slope and excavations should be set-back at least ten feet (measured horizontally) from any nearby structure or property line. Any excavations which cannot meet this requirement will need to have a shoring system designed to support steeper sidewall gradients.

FOUNDATION RECOMMENDATIONS

42. At the time we prepared this report, foundation and grading plans had not been completed and structure locations and foundation details had not been finalized. We request an opportunity to review these items during the design stages to determine if supplemental recommendations will be required.

Drilled Pier Foundations – Pedestrian Bridge

43. The following recommendations are based on the proposed bridge location spanning Struve Slough. If the bridge site is changed, we request the opportunity to review proposed plans to confirm if these recommendations still apply.

44. Based upon the results of our investigation, we recommend that the proposed pedestrian bridge be supported on a pile foundation bearing into competent soil. The foundation design for the bridge should consider the following geotechnical criteria, which will most likely need to be revised following supplemental CPT work and subsequent analysis.

Soil Stratigraphy

45. Based on our limited soil boring data at the slough margins and review of subsurface information obtained for the Highway One Struve Slough Bridge, we have developed a general profile of soil stratigraphy to approximate the subsurface materials which were predominantly encountered in our exploratory borings and CPT sounding. Given the complexity of the subsurface conditions beneath the slough crossing, we recommend additional subsurface data in order to fully develop the geotechnical criteria required for foundation design of the bridge crossing.

46. The following profiles may be considered for preliminary lateral pile analysis, but are not yet suitable for design at specific pile locations within the slough. Revisions to these profiles should be anticipated upon completion of supplemental CPT work and subsequent analysis.

LPILE Soil Profile - PRELIMINARY										
Assumptions:	Water Surface Elevation 5'									
	Pile embedment below the water surface									
	Minimum pile diameter = 48 inches									
	Cohesionless or cohesive soil conditions (no phi-c soils)									
	Dense sand layer extends at least to Elevation -100 feet (per CalTrans boring B7)									
Boring B-3 - North side of slough ~ Sta 2+90				Soil Layer Elevation		Effective Unit Weight	Clay Soil			Sand Soil	
			Soil Type	Top	Bottom	pcf	Cohesion, psf	k	E_{50}	Friction, degrees	k
	Layer	1	Sand (Reese)	6.0	3.5	75				28	20 pci
		2	Stiff Clay with Free Water	3.5	1.0	105	500	0	0		
		3	Peat	1.0	-19.0	10	1	0	0		
		4	Stiff Clay with Free Water	-19.0	-39.0	105	500	0	0		
		5	Sand (Reese)	-39.0	-100.0	64				35	125 pci
Center of Slough - ROUGHLY Interpreted & projected from Boring CT B 7 & B9 at Hwy 1 Bridge											
	Layer	1	Peat	4.0	-50.0	10	1	0	0		
		2	Stiff Clay w/o Free Water	-40.0	-60.0	105	1000	0	0		
		3	Sand (Reese)	-60.0	-70.0	75				40	125 pci
		4	Stiff Clay w/o Free Water	-70.0	-80.0	105	1000	0	0		
		5	Sand (Reese)	-80.0	-100.0	75				35	125 pci
CPT 1 South Edge of Slough ~ Sta 8+45											
	Layer	1	Soft Clay (Matlock)	6.0	-24.0	50	1	0	0		
		2	Stiff Clay with Free Water	-24.0	-39.0	50	1000	0	0		
		3	Sand (Reese)	-39.0	-44.0	60				35	125 pci
		4	Stiff Clay w/o Free Water	-44.0	-64.0	50	1500	0	0		
		5	Sand (Reese)	-64.0	-69.0	60				35	125 pci
Boring 1 - South Side of Slough ~ Sta 10+00 (South Abutment)											
	Layer	1	Sand (Reese)	12.5	10.0	110				28	20 pci
		2	Soft Clay (Matlock)	10.0	7.5	110	200	0	0		
		3	Stiff Clay with Free Water	7.5	5.5	105	500	0	0		
		4	Liquified Sand (Rollins)	5.5	-12.5	62					
		5	Stiff Clay with Free Water	-12.5	-27.5	105	1500	0	0		
		6	Sand (Reese)	-27.5	-32.5	65				30	60 pci
		7	Stiff Clay w/o Free Water	-32.5	-52.0	105	1500	0	0		

47. The following preliminary geotechnical criteria should be considered when developing axial capacity of the piles. Again, this criteria may need to be revised upon obtaining supplemental subsurface information at proposed pile locations in the slough:

   a. The piers should derive their capacity through friction resistance between the concrete and the surrounding soil. An allowable skin friction resistance of 450 psf of surface area should be used for design of the bridge piers.

   b. Downdrag forces may be applicable as an additional vertical load to the pile.

   c. Skin friction should be neglected over the upper 17 feet of pier depth at the bridge abutments, increasing to 60 feet of neglected pier depth at the center of the bridge. For preliminary design purposes, the zone of neglect should be increased by 10 feet for each 100 feet of bridge length from the abutments to the center of the bridge. End bearing capacity of the pier should also be neglected.

d. A distributed load of 45 pcf equivalent fluid pressure should be applied to the upper 6 feet of pier embedment, acting over a plane 1½ times the pier diameter.

e. Minimum pier embedment should be 20 feet into competent native soil. We anticipate that this could result in pier depths on the order of 80 feet or more within the slough. Actual design depths should be determined by the project structural engineer.

f. Piers should have a minimum diameter of 48 inches and have a minimum spacing of at least four diameters, center-to-center spacing.

g. A reduction for group action is not considered necessary for drilled piers unless the piers are spaced less than 3 pier diameters apart.

h. The piers and grade beams should contain steel reinforcement as determined by the project civil or structural engineer.

i. All piers must be constructed within ½ percent of a vertically plumb condition.

j. Casing should anticipated within the pier excavations. Casing should be pulled during the placement of concrete, with a minimum of 4 feet of casing remaining embedded within the concrete at all times.

k. Water will have to either be pumped out of the pier holes before steel and concrete placement or the concrete placed through a tremie. If concrete is placed through a tremie, the bottom 4 feet of the tremie pipe must remain embedded within the concrete at all times.

l. The base of all pier holes should be cleaned of all loose soil prior to placement of steel and concrete. All pier construction must be observed by a Pacific Crest Engineering Inc. so that we can verify that piers extend sufficiently into competent bearing materials. Any piers constructed without the full knowledge and continuous observation of a representative from Pacific Crest Engineering Inc., will render the recommendations of this report invalid.

<u>RETAINING WALLS</u>

48. Site retaining walls may be founded on spread footings bearing upon a minimum of 18 inches of engineered fill as discussed above. We recommend a minimum footing embedment depth of 18 inches.

49. Retaining wall footings may be designed for the following allowable bearing capacities:

- 1,800 psf for dead plus live load
- a 1/3rd increase for seismic or wind load

50. All retaining wall footings should be set back or deepened such that a minimum of 10 feet measured horizontally exists between the downslope face of the footing and the face of an adjacent slope.

51. We recommend the following lateral earth pressure values be used for retaining wall design. Active earth pressure values may be used when walls are free to yield an amount sufficient to develop the active earth pressure condition (about ½% of height). The effect of wall rotation should be considered for areas behind the planned retaining wall (pavements, foundations, slabs, etc.). When walls are restrained at the top or to design for minimal wall rotation, use the at-rest earth pressure values.

52. The lateral earth pressure design criteria provided in this report assume fully drained conditions behind the retaining wall structure.

Table No. 4 - Active and At-Rest Earth Pressure Values

Backfill Slope (H:V)	Active Earth Pressure (psf/ft of depth)	At-rest Earth Pressure (psf/ft of depth)
Level	45	60
3:1	50	78
2:1	60	85

Please note: Should the slope behind the retaining walls be other than shown in above table, supplemental design criteria will be provided for the active earth or at rest pressures for the particular slope angle.

53. For resisting passive earth pressure use 300 psf/ft of depth. To develop the resisting passive earth pressure, the retaining wall footings should be embedded a minimum of 18 inches below the lowest adjacent grade. Additionally, there must be a minimum of 5 feet of soil, measured horizontally, in front of the outside edge of the footing for passive pressures to develop.

54. Design for a “coefficient of friction” between base of foundation and soil of 0.30.

55. If both friction and passive pressure are used to resist lateral forces, then one of the values should be reduced by 50 percent.

56. The mechanics of soil pressure on the footing keyway intended to enhance sliding stability has been considered. The active pressure on the keyway, acting opposite the passive pressure, may be taken as zero.

57. For surcharge pressures due to live or dead loads which transmit a force to the wall, refer to Figure No. 23.

58. Traffic surcharges on the retaining wall may be simulated by assuming that an additional 2 feet of soil (250 psf) exists on the inboard side of the wall.

59. If the structural designer wishes to include seismic forces in their design, the wall may be designed using the above soil pressures plus a horizontal seismic force of $15H^2$ pounds per lineal foot (where H is the height of retained material). The resultant seismic force should be applied at a point 1/3rd above the base of the wall. This force has been estimated using the Mononobe-Okabe method of analysis as modified by Whitman (1990) and Lew and Sitar (2010).

60. Where short term earthquake or wind loads are included, the minimum safety factor for retaining wall sliding and overturning shall be 1.1 for earthquake loads and 1.2 for wind loads.

61. The above criteria are based on **fully drained conditions**. Therefore, we recommend that permeable material meeting the State of California Standard Specification Section 68-1.025, Class 1, Type A, be placed behind the wall, with a minimum width of 12 inches and extending for the full height of the wall to within 1 foot of the ground surface. The permeable material should be covered with Mirafi 140N or equivalent filter fabric. Compacted native soil should then be placed over the filter fabric to the ground surface. A 4- inch diameter perforated rigid plastic drain pipe should be installed within 3 inches of the bottom of the permeable material and be discharged to a suitable, approved location. The perforations should be located and oriented on the lower half of the pipe. Neither the pipe nor the permeable material should be wrapped in filter fabric. Please refer to Figure No. 24, Typical Retaining Wall Drain Detail.

62. Weepholes are also an acceptable alternative method for draining the retaining wall. If used, the weepholes should outlet at or near the base of the wall. Weepholes should consist of pipes with an inside diameter of at least 2 inches. The weepholes should extend through the wall and positively connect with the drain rock. To minimize the potential for debris to clog the pipe, the pipes should slant with a 4% downward gradient towards the outside face of the wall. Mirafi 180N filter fabric should be placed adjacent to the wall directly behind the weepholes. The weepholes should be spaced not more than 5 feet apart. The outside end of the drain pipes should be protected with a galvanized wire mesh screen, grate cap or an equivalent system. Please refer to Figure 22, Typical Retaining Wall Drain Detail.

63. The wall must be constructed in a manner that prevents the loss of drain rock at the ends of the wall. Containment of the drain rock may be achieved by embedding the ends of the wall into solid ground.

64. The area behind the wall and beyond the permeable material should be compacted with approved material to a minimum relative dry density of 90%.

PAVEMENT DESIGN

65. The soils that will predominately comprise the trail/pavement subgrade will in all likelihood be the clay soils encountered in our borings. We have conservatively assumed a minimum R-Value of 5 for design of the pavement sections noted below. This must be verified in the field and, if necessary, modifications made to these tentative sections.

66. For design purposes, the following traffic indices are suggested*:

a. Off-Street Bike Paths & Pedestrian Trails T.I. = 3
b. Street and Road Traffic Lanes T.I. = 5½
c. Truck usage areas T.I. = 6½

*Pacific Crest Engineering Inc. has not performed a site specific traffic study to determine the actual traffic indices associated with this project. These values are for general design purposes only and the values may need modification. Traffic volume and equivalent axle loads that exceed the assumed TI could be destructive to the pavement, resulting in an accelerated rate of deterioration and the need for increased maintenance.

67. The table below provides a flexible pavement design which is based on the 6th Edition of the Caltrans Highway Design Manual – Chapter 630 (last updated December 31, 2016).

68. The following pavement sections are suggested:

Table No. 5, Recommended Pavement Sections

Material	Traffic Index		
	3	5½	6½
Asphalt Concrete	2.0 inches	3.5 inches	4.0 inches
Class 2 Aggregate Base, R=78 min.	6.0 inches	11.0 inches	14 inches

Please Note: A Traffic Index of 3 assumes loads associated with a bike lane designation such as those applied by normal bike and pedestrian traffic and the occasional light maintenance vehicle. Higher traffic indices should be applied for pavement sections subjected to regular and/or frequent vehicle traffic.

69. To have the selected pavement sections perform to their greatest efficiency, it is very important that the following items be considered:

a. Properly scarify and moisture condition the upper 8 inches of the subgrade soil and compact it to a minimum of 95% of its maximum dry density, at a moisture content of 1 to 3% over the optimum moisture content for the soil.

b. Provide sufficient gradient to prevent ponding of water.

c. Use only quality materials of the type and thickness (minimum) specified. All aggregate base and subbase must meet Caltrans Standard Specifications for Class 2 materials, and be angular in shape. All Class 2 aggregate base should be ¾ inch maximum in aggregate size.

d. Compact the base and subbase uniformly to a minimum of 95% of its maximum dry density.

e. Use ½ inch maximum, Type "A" medium graded asphaltic concrete. Place the asphaltic concrete only during periods of fair weather when the free air temperature is within prescribed limits by Cal Trans Specifications.

f. Porous pavement systems which consist of porous paving blocks, asphaltic concrete or concrete are generally not recommended due to the potential for saturation of the subgrade soils and resulting increased potential for a shorter pavement life. At a minimum, porous pavement systems should include a layer of Mirafi HP370 geotextile fabric placed on the subgrade soil beneath the porous paving section. These pavement systems should only be used with the understanding by the Owner of the increased potential for pavement cracking, rutting, potholes, etc.

g. Maintenance should be undertaken on a routine basis.

<u>SURFACE DRAINAGE</u>

70. Surface water drainage is the responsibility of the project civil engineer. The following should be considered by the civil engineer in design of the project.

71. Surface water should not be allowed to pond on the pathway or pavement areas to the maximum extent possible.

72. Slope failures can occur where surface drainage is allowed to concentrate on unprotected slopes. Appropriate landscaping and surface drainage control around the project area is imperative in order to minimize the potential for shallow slope failures and erosion. Stormwater discharge locations should not be located at the top or on the face of any slope.

73. Following completion of the project we recommend that storm drainage provisions and performance of permanent erosion control measures be closely observed through the first season of significant rainfall, to determine if these systems are performing adequately and, if necessary, resolve any unforeseen issues.

74. The surface drainage facilities must not be altered nor any filling or excavation work performed in the area without first consulting Pacific Crest Engineering Inc. Surface drainage improvements developed by the project civil engineer must be maintained by the property owner at all times, as improper drainage provisions can produce undesirable affects.

EROSION CONTROL

75. The surface soils are classified as having a moderate potential for erosion. Therefore, the finished ground surface should be planted with ground cover and continually maintained to minimize surface erosion. For specific and detailed recommendations regarding erosion control on and surrounding the project site, the project civil engineer or an erosion control specialist should be consulted.

76. The surfaces of all cut and fill slopes, if proposed, should be prepared and maintained to reduce erosion. This work, at a minimum, should include track rolling of the slope and effective planting. The protection of the slopes should be installed as soon as practicable so that a sufficient growth will be established prior to inclement weather conditions. It is vital that no slope be left standing through a winter season without the erosion control measures having been provided.

PLAN REVIEW

77. We respectfully request an opportunity to review the project plans and specifications during preparation and before bidding to verify that the recommendations of this report have been included and to provide additional recommendations, if needed. These plan review services are also typically required by the reviewing agency. Misinterpretation of our recommendations or omission of our requirements from the project plans and specifications may result in changes to the project design during the construction phase, with the potential for additional costs and delays in order to bring the project into conformance with the requirements outlined within this report. Services performed for review of the project plans and specifications are considered "post-report" services and billed on a "time and materials" fee basis in accordance with our latest Standard Fee Schedule.

V. LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. This Geotechnical Investigation was prepared specifically for MME and for the specific project and location described in the body of this report. This report and the recommendations included herein should be utilized for this specific project and location exclusively. This Geotechnical Investigation should not be applied to nor utilized on any other project or project site. Please refer to the ASFE "Important Information about Your Geotechnical Engineering Report" attached with this report.

2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be provided.

3. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field.

4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural process or the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside of our control. This report should therefore be reviewed in light of future planned construction and then current applicable codes. This report should not be considered valid after a period of two (2) years without our review.

5. This report was prepared upon your request for our services in accordance with currently accepted standards of professional geotechnical engineering practice. No warranty as to the contents of this report is intended, and none shall be inferred from the statements or opinions expressed.

6. The scope of our services mutually agreed upon for this project did not include any environmental assessment or study for the presence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site.

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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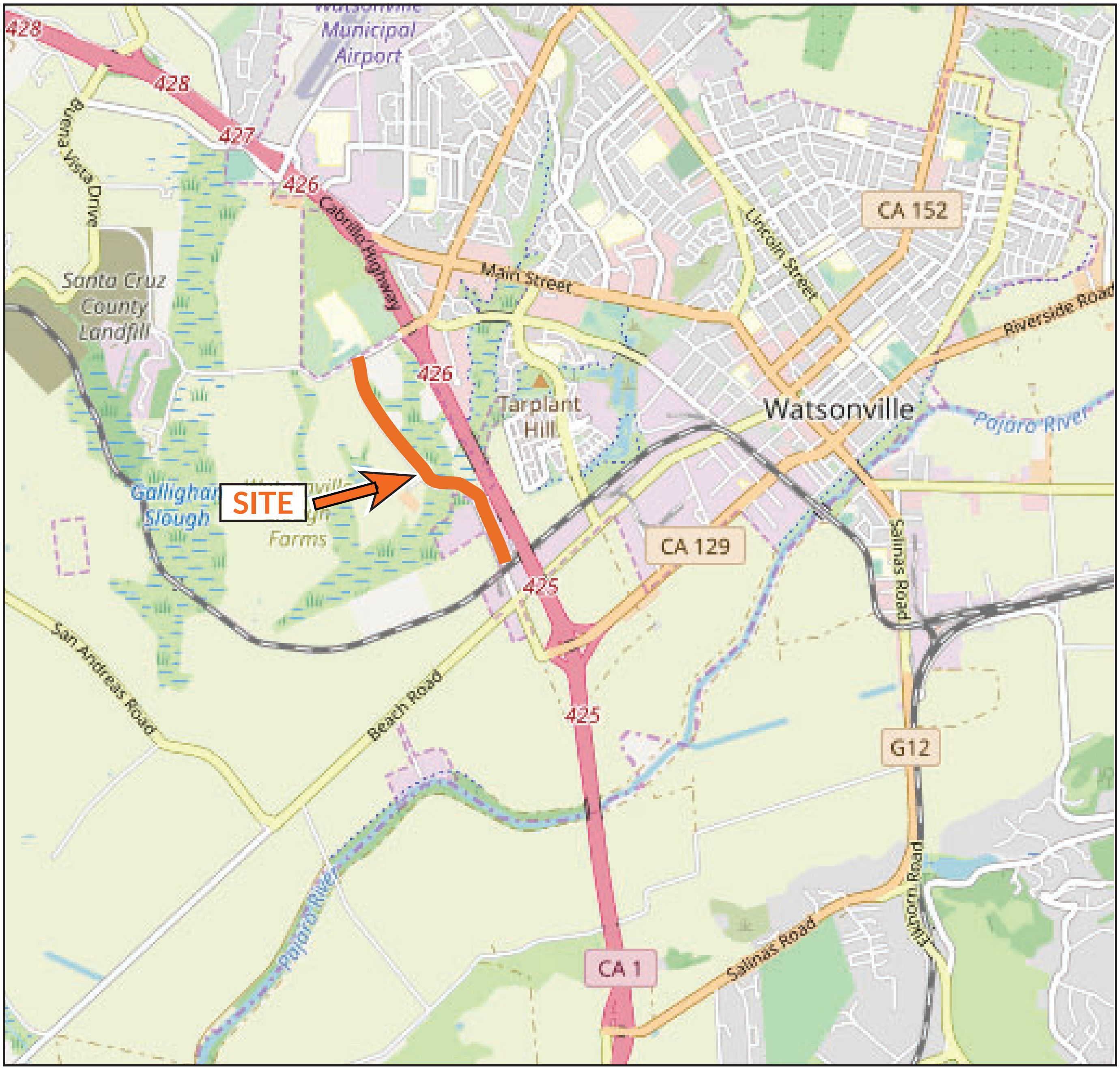
e-mail: info@asfe.org www.asfe.org

APPENDIX A

Regional Site Map
Site Map Showing Test Borings
Key to Soil Classification
Log of Test Borings
Atterberg Limits Test Results
Direct Shear Test Results
Organic Content Test Results
Typical Keyway/Bench Detail
Surcharge Pressure Diagram
Typical Retaining Wall Drain Detail



Base Map: © OpenStreetMap contributors

Pacific Crest ENGINEERING INC	**Regional Site Map** Lee Road Trail Watsonville, California	Figure No. 1 Project No. 1922 Date: 9/4/20

EXPLANATION

B-6 Approximate Location of Test Boring

CPT-1 Approximate Location of CPT Sounding

0 600 400

Scale: 1 inch = 600 feet

Base Map Provided by:
Mid Coast Engineers

Pacific Crest
ENGINEERING INC

Site Map Showing Proposed Test Boring Locations
Lee Road Trail
Watsonville, California

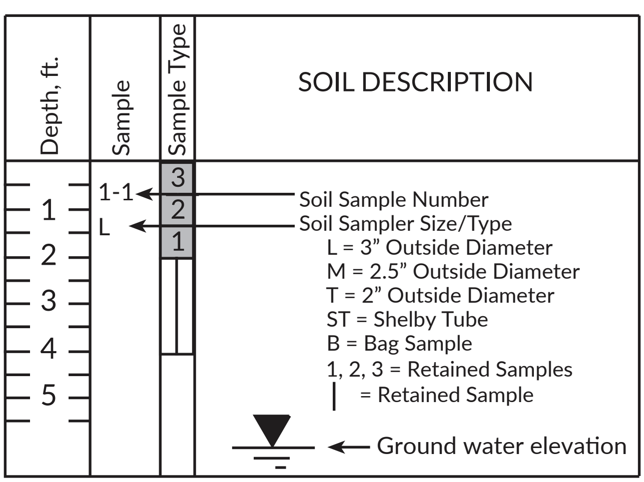
Figure No. 2
Project No. 1922
Date: 9/4/20

KEY TO SOIL CLASSIFICATION - FINE GRAINED SOILS (FGS)
UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modified)

MAJOR DIVISIONS		SYMBOL	FINES	COARSENESS	SAND/GRAVEL	GROUP NAME
SILT AND CLAY	*LL < 35% Low Plasticity	**CL** Lean Clay PI > 7 Plots Above A Line -OR- **ML** Silt PI > 4 Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Lean Clay / Silt
				15-30% plus No. 200	% sand ≥ % gravel	Lean Clay with Sand / Silt with Sand
					% sand < % gravel	Lean Clay with Gravel / Silt with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Lean Clay / Sandy Silt
					≥ 15% gravel	Sandy Lean Clay with Gravel / Sandy Silt with Gravel
				% sand < % gravel	< 15% sand	Gravelly Lean Clay / Gravelly Silt
					≥ 15% sand	Gravelly Lean Clay with Sand / Gravelly Silt with Sand
		CL - ML 4 < PI < 7	<30% plus No. 200	<15% plus No. 200		Silty Clay
				15-30% plus No. 200	% sand ≥ % gravel	Silty Clay with Sand
					% sand < % gravel	Silty Clay with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Silty Clay
					≥15% gravel	Sandy Silty Clay with Gravel
				% sand < % gravel	< 15% sand	Gravelly Silty Clay
					≥15% sand	Gravelly Silty Clay with Sand
	35% ≤ *LL < 50% Intermediate Plasticity	**CI** -OR- **MI**	<30% plus No. 200	<15% plus No. 200		Clay/ Silt
				15-30% plus No. 200	% sand ≥ % gravel	Clay with Sand/ Silt with Sand
					% sand < % gravel	Clay with Gravel/ Silt with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Clay/ Sandy Silt
					≥ 15% gravel	Sandy Clay with Gravel/ Sandy Silt with Gravel
				% sand < % gravel	< 15% sand	Gravelly Clay/ Gravelly Silt
					≥ 15% sand	Gravelly Clay with Sand/ Gravelly Silt with Sand
	*LL > 50% High Plasticity	**CH** Fat Clay Plots Above A Line -OR- **MH** Elastic Silt Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Fat Clay or Elastic Silt
				15-30% plus No. 200	% sand ≥ % gravel	Fat Clay with Sand Elastic Silt with Sand
					% sand < % gravel	Fat Clay with Gravel / Elastic Silt with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Fat Clay / Sandy Elastic Silt
					≥ 15% gravel	Sandy Fat Clay with Gravel / Sandy Elastic Silt with Gravel
				% sand < % gravel	< 15% sand	Gravelly Fat Clay / Gravelly Elastic Silt
					≥ 15% sand	Gravelly Fat Clay with Sand / Gravelly Elastic Silt with Sand

* LL = Liquid Limit
* PI = Plasticity Index

BORING LOG EXPLANATION



MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table

CONSISTENCY

DESCRIPTION	UNCONFINED SHEAR STRENGTH (KSF)	STANDARD PENETRATION (BLOWS/FOOT)
VERY SOFT	< 0.25	< 2
SOFT	0.25 - 0.5	2 - 4
FIRM	0.5 - 1.0	5 - 8
STIFF	1.0 - 2.0	9 - 15
VERY STIFF	2.0 - 4.0	16 - 30
HARD	> 4.0	> 30

KEY TO SOIL CLASSIFICATION - COARSE GRAINED SOILS
UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modified)

MAJOR DIVISIONS		FINES	GRADE/TYPE OF FINES	SYMBOL	GROUP NAME *
GRAVEL	More than 50% of coarse fraction is larger than No. 4 sieve size	<5%	Cu ≥ 4 and 1 ≤ Cc ≤ 3	**GW**	Well-Graded Gravel / Well-Graded Gravel with Sand
			Cu < 4 and/or 1 > Cc > 3	**GP**	Poorly Graded Gravel/Poorly Graded Gravel with Sand
		5-12%	ML or MH	**GW - GM**	Well-Graded Gravel with Silt / Well- Graded Gravel with Silt and Sand
				GP - GM	Poorly Graded Gravel with Silt / Poorly Graded Gravel with Silt and Sand
			CL, CI or CH	**GW - GC**	Well-Graded Gravel with Clay / Well-Graded Gravel with Clay and Sand
				GP - GC	Poorly Graded Gravel with Clay / Poorly Graded Gravel with Clay and Sand
		>12%	ML or MH	**GM**	Silty Gravel / Silty Gravel with Sand
			CL, CI or CH	**GC**	Clayey Gravel/ Clayey Gravel with Sand
			CL - ML	**GC - GM**	Silty, Clayey Gravel/ Silty, Clayey Gravel with Sand
SAND	50% or more of coarse fraction is smaller than No. 4 sieve size	<5%	Cu ≥ 6 and 1 ≤ Cc ≤ 3	**SW**	Well-Graded Sand / Well-Graded Sand with Gravel
			Cu < 6 and/or 1 > Cc > 3	**SP**	Poorly Graded Sand / Poorly Graded Sand with Gravel
		5-12%	ML or MH	**SW - SM**	Well-Graded Sand with Silt / Well- Graded Sand with Silt and Gravel
				SP - SM	Poorly Graded Sand with Silt / Poorly Graded Sand with Silt and Gravel
			CL, CI or CH	**SW - SC**	Well-Graded Sand with Clay / Well-Graded Sand with Clay and Gravel
				SP - SC	Poorly Graded Sand with Clay / Poorly Graded Sand with Clay and Gravel
		>12%	ML or MH	**SM**	Silty Sand / Silty Sand with Gravel
			CL, CI or CH	**SC**	Clayey Sand / Clayey Sand with Gravel
			CL - ML	**SC - SM**	Silty, Clayey Sand / Silty, Clayey Sand with Gravel

* The term “with sand” refers to materials containing 15% or greater sand particles within a gravel soil, while the term “with gravel” refers to materials containing 15% or greater gravel particles within a sand soil.

US STANDARD SIEVE SIZE: 3 inch | ¾ inch | No. 4 | No. 10 | No. 40 | No. 200 | 0.002 µm

	COARSE	FINE	COARSE	MEDIUM	FINE		
COBBLES AND BOULDERS	GRAVEL		SAND			SILT	CLAY

RELATIVE DENSITY

DESCRIPTION	STANDARD PENETRATION (BLOWS/FOOT)
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	> 50

MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table

LOGGED BY MWL | DATE DRILLED 4/10/19 | BORING DIAMETER 6" HS | BORING NO. 1

DRILL RIG EGI Mobile B-53 | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 3" **AB:** 6"									
1	1-1 L		**FILL: SILTY SAND/ SANDY SILT:** Very dark brown (10YR 2/2) and black (10YR 2/1), fine to medium grained, trace coarse gained sand, trace gravels, moist, loose/stiff	SM/ML	6 9							
2		2 1			8	9/14		17.4	93.0			
3	1-2 T		**NATIVE: SANDY ELASTIC SILT:** Black (10YR 2/1) very fine to medium grained sand, trace rootlets, moist, soft	MH	1 2							
4					2	4		46.9			29	
5	1-3 L		**SANDY LEAN CLAY:** dark grayish brown (10YR 4/2), trace coarse grained sand, oxidation staining, trace rootlets,trace subangular to subrounded gravels up to ¼" in diameter, moist, stiff	CL	4							
6		2			6		2.0	17.8	109.1	57.8	16	Qu = 3250 psf
		1	Color change to dark yellowish brown (10YR 4/4), fine to coarse grained sand, moist, stiff		9	12		19.3	108.0			
7												
8												
9												
10	1-4 L		Color change to bluish gray		9							
11		2 1	**CLAYEY SAND:** Dark yellowish brown (10YR 4/6), fine to coarse grained sand, high plasticity clay, oxidation staining, moist, medium dense	SC	11 16	14		17.0	110.6	32.7	20	
12												
13												
14												
15	1-5 T		**SILTY SAND:** Dark yellowish brown (10YR 4/6), very fine to medium grained, trace coarse grains, wet, medium dense	SM	5							
16					10 10	20		28.5		15.1		
17												
18												
19												
20	1-6 T		**SILT:** Olive gray (5Y 5/3) with dark yellowish brown laminations, intermediate plasticity, trace sand, wet, stiff	MI	4							
21					5 7	12		33.0		93.0	12	
22												
23												

LOGGED BY MWL DATE DRILLED 4/10/19 BORING DIAMETER 6" HS BORING NO. 1

DRILL RIG EGI Mobile B-53 HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
24			**SILT:** Olive gray (5Y 5/3) with dark yellowish brown laminations, intermediate plasticity, trace sand, wet, stiff	MI								
25	1-7 T		**LEAN SILTY CLAY:** Bluish gray (GLEY2 5/1), uniform sample, high toughness, wet, very stiff	CL	7 9 13	22		32.8				
26–29												
30	1-8 T		**FAT CLAY:** Bluish gray (GLEY2 5/1), uniform sample, wet, very stiff	CH	8 9 12	21		33.8		99.0	30	
31–34												
35	1-9 T		Wet, very stiff		7 9 12	21		33.3				
36–39												
40	1-10 T		**SANDY SILT:** Olive gray with dark yellowish brown, very fine to fine grained sand, oxidation staining, wet, hard	MI	10 14 21	35		30.5		55.1	12	
41–44												
45	1-11 T		**FAT CLAY:** Bluish gray (GLEY2 5/1), uniform sample, high toughness, wet, very stiff	CH	6 9 11	20		33.0		99.8	45	
46												

LOGGED BY MWL | DATE DRILLED 4/10/19 | BORING DIAMETER 6" HS | BORING NO. 1

DRILL RIG EGI Mobile B-53 | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			FAT CLAY: Bluish gray (GLEY2 5/1), uniform sample, high toughness, moist, very stiff	CH								
47												
48												
49												
50	1-12 T		**CLAY:** Bluish gray (GLEY2 5/1) uniform sample, less tough than previous sample, moist, very stiff	CI	9							
51					12							
					18	30		31.9				
52			Boring terminated at 51½ feet. Groundwater encountered at 15 feet.									
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64												
65												
66												
67												
68												
69												

Pacific Crest ENGINEERING INC

Log of Test Borings
Lee Road Trail
Watsonville, California

Figure No. 7
Project No. 1922
Date: 9/4/20

LOGGED BY MWL | DATE DRILLED 4/10/19 | BORING DIAMETER 6" HS | BORING NO. 2

DRILL RIG EGI Mobile B-53 | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
0			**FILL: SILTY SAND WITH GRAVEL:** Bluish gray (GLEY2 5/1) with dark brown, fine to coarse grained sand, angular gravels up to ½" in diameter, moist to wet, medium dense	SM								
1	2-1 L	2, 1			18, 14, 14	15		17.8	99.1			
2½	2-2 T		**NATIVE: FAT CLAY:** Very dark brown, moist, very stiff	CH	4, 7, 9	16		31.5		99.3	56	
4½			**SANDY CLAY:** Dark gray(10YR 4/1), with dark yellowish brown, fine to medium grained sand, low toughness, tree root in sample, moist, very stiff	CI								
5	2-3 L	1			7, 9, 11	16	1.8	39.0	61.6			Qu = 2283 psf
9½			**FAT CLAY:** Bluish gray (GLEY2 5/1) and yellowish brown (10YR 5/4), high plasticity, trace fine grained sand, trace rootlets, moist, very stiff	CH								
10	2-4 L	2, 1			11, 16, 19	25	2.0	45.7	72.3	98.4		Qu = 2979 psf
15	2-5 T		Moist, stiff		3, 4, 6	10		38.9				
19½			**SILTY CLAY:** Olive gray with yellowish brown, high plasticity, trace sand, oxidation staining, moist, stiff	CH								
20	2-6 T				5, 7, 8	15		33.8				
21½			Boring terminated at 21½ feet. Groundwater not encountered.									

Pacific Crest
ENGINEERING INC

Log of Test Borings
Lee Road Trail
Watsonville, California

Figure No. 8
Project No. 1922
Date: 9/4/20

LOGGED BY MWL DATE DRILLED 4/10/19 BORING DIAMETER 6" HS BORING NO. 3

DRILL RIG EGI Mobile B-53 HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
0			**AC:** 6½"									
1–2	3-1 L	- 2 1	**FILL: SILTY SAND WITH GRAVEL:** Bluish gray (GLEY2 5/1) with dark brown, fine to coarse grained sand, angular gravels up to ½" in diameter, moist to wet, medium dense	SM	15 14 11	13		8.9	120.1			13% Gravel 48% Sand 39% Fines
3–4	3-2 T		**NATIVE: SANDY LEAN CLAY:** Very dark brown, fine to coarse grained sand, moist, stiff	CL	6 7 8	15		10.8			9	
5–6	3-3 L	2 1	**PEAT:** Black (10YR 2/1), trace sand, abundant organics, wet, stiff	PT	5 7 6	11	0.25	259.6	19.5	31.3		Qu = 740 psf
7												
8												
9												
10–11	3-4 L	2 1	Wet, soft		1 3 3	5	0.25	462.2	11.2			Qu = 607 psf
12												
13												
14												
15–16	3-5 T		**SANDY FAT CLAY:** Dark gray, high elasticity, very sticky texture, trace coarse grained sand, trace organics, wet, soft	CH	1 2 2	4		31.6				
17												
18												
19												
20–21	3-6 T		**SANDY LEAN CLAY:** Black with bluish gray (GLEY2 5/1), trace gravels up to 3/4" in diameter, moist, stiff	CL	4 5 6	11		53.9			28	
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Lee Road Trail
Watsonville, California

Figure No. 9
Project No. 1922
Date: 9/4/20

LOGGED BY MWL DATE DRILLED 4/10/19 BORING DIAMETER 6" HS BORING NO. 3

DRILL RIG EGI Mobile B-53 HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
24			**SANDY LEAN CLAY:** Black with bluish gray (GLEY2 5/1), trace gravels up to 3/4" in diameter, moist, stiff	CL								
25	3-7 T		**SANDY CLAY:** Mottled olive and gray, trace angular coarse grained sand, intermediate plasticity, oxidation staining, moist, stiff	CI	5 5 9	14		19.8				
26												
27												
28												
29												
30	3-8 T		Decrease in sand fraction, very moist to wet, stiff		5 6 7	13		27.0		74.0		
31												
32												
33												
34												
35	3-9 L	2 1	Color change to Bluish gray (GLEY2 5/1), increase in sand fraction, subangular coarse grained sand, moist, very stiff		6 12 17	22	2.9	21.8	103.4			Qu = 4254 psf
36												
37												
38												
39			**POORLY GRADED SAND:** Dark brown with olive brown, fine to medium grained, wet, medium dense	SP								
40	3-10 L	2 1			10 12 22	18		27.4	92.3			
41												
42												
43												
44												
45	3-11 L	1	Wet, very dense		10 26 50/5"	50/5"		21.7	102.9	6.5		
46												

LOGGED BY MWL DATE DRILLED 4/10/19 BORING DIAMETER 6" HS BORING NO. 3

DRILL RIG EGI Mobile B-53 HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			POORLY GRADED SAND: Dark brown with olive brown, fine to medium grained, wet, very dense	SP								
47			Increased drilling resistance at 47'									
48												
49												
50	3-12 T		**WELL GRADED SAND:** Variegated, very fine to coarse grained, subrounded to subangular shaped, wet, very dense	SW								
51					50/6"	50/6"		17.1				
52			Boring terminated at 51½ feet. Groundwater noted at 1 foot below the road surface									
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64												
65												
66												
67												
68												
69												

LOGGED BY MWL | DATE DRILLED 4/10/19 | BORING DIAMETER 6" HS | BORING NO. 4

DRILL RIG EGI Mobile B-53 | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
0			**AC:** 6½"									
1–2	4-1	L (2, 1)	**NATIVE: SILTY SAND:** Very dark brown, fine to coarse grained, trace small gravels, slightly moist, loose	SM	6 8 12	10		10.0	118.1	45.4		Direct Shear φ_{peak} = 30.5° c_{peak} = 436 psf $\varphi_{ult.}$ = 29.0° $c_{ult.}$ = 348 psf
3–4	4-2	T	**CLAYEY SAND:** Dark gray and dark yellowish brown, intermediate plasticity, slightly moist, subangular shaped, medium to coarse grained sand, slightly moist, stiff medium dense	SC	5 6 7	13		13.0		47.3	21	
5–6	4-3	L (2, 1)	Color change to olive gray and dark reddish brown, increased sand fraction, slightly moist, medium dense		6 12 15	14		13.8	112.7	28.8		Qu = 3094 psf
7												
8												
9												
10	4-4	L (2, 1)	**POORLY GRADED SAND/ SILTY SAND:** Dark yellowish brown and olive brown, very fine to medium grained, very moist, medium dense	SP/ SM	14 12							
11			**SANDY FAT CLAY:** Mottled olive and gray, oxidation staining, moist, very stiff	CH	15	20	2.9	26.1	94.5	84.3	42	
12												
13												
14												
15–16	4-5	T	Color change to olive brown and dark yellowish brown, increased sand fraction, moist, very stiff		6 8 10	18		25.3		68.7		
17												
18												
19												
20–21	4-6	T	**CLAYEY SAND:** Variegated, olive brown and dark yellowish brown, fine to coarse grained sand, wet, medium dense	SC	8 12 16	28		21.4				
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Lee Road Trail
Watsonville, California

Figure No. 12
Project No. 1922
Date: 9/4/20

LOGGED BY MWL DATE DRILLED 4/10/19 BORING DIAMETER 6" HS BORING NO. 4

DRILL RIG EGI Mobile B-53 HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
24			**CLAYEY SAND:** Variegated, olive brown and dark yellowish brown, fine to coarse grained sand, wet, medium dense	SC								
25	4-7 T		Wet, dense		12							
26					16							
					30	46		21.4				
27			Boring terminated at 26½ feet. No groundwater encountered.									
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												

Pacific Crest ENGINEERING INC

Log of Test Borings
Lee Road Trail
Watsonville, California

Figure No. 13
Project No. 1922
Date: 9/4/20

LOGGED BY MWL | DATE DRILLED 5/2/19 | BORING DIAMETER 6" HS | BORING NO. 5

DRILL RIG EGI Mobile B-61 | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 6½"									
1	5-1 L		**FILL: SANDY FAT CLAY:** Very dark gray, fine to coarse grained sand, trace subangular gravels up to ¾" in diameter, slightly moist, very stiff	CH	7							
2					11							
		1			24	25		13.7	112.5			Qu = 2927 psf
3	5-2 T		**NATIVE: TERRACE DEPOSITS: FAT CLAY:** Dark gray and yellowish brown, slightly moist, very stiff	CH	9							
					11							
4					17	28		22.6		89.6	52	
5	5-3 L		Color change to dark yellowish brown, oxidation staining, slightly moist to moist, very stiff		12							
6		2			18			34.5	85.4	99.9		Qu = 6741 psf
		1			26	30						
7												
8												
9												
10	5-4 T		**NATIVE: TERRACE DEPOSITS: SANDY FAT CLAY:** reddish brown and yellowish brown, fine to medium grained sand, moist, very stiff	CH	8							
11					14							
					18	32		18.7		60.7		
12			Boring terminated at 11½ feet. Groundwater not encountered.									
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Lee Road Trail
Watsonville, California

Figure No. 14
Project No. 1922
Date: 9/4/20

LOGGED BY MWL DATE DRILLED 5/2/19 BORING DIAMETER 6" HS BORING NO. 6

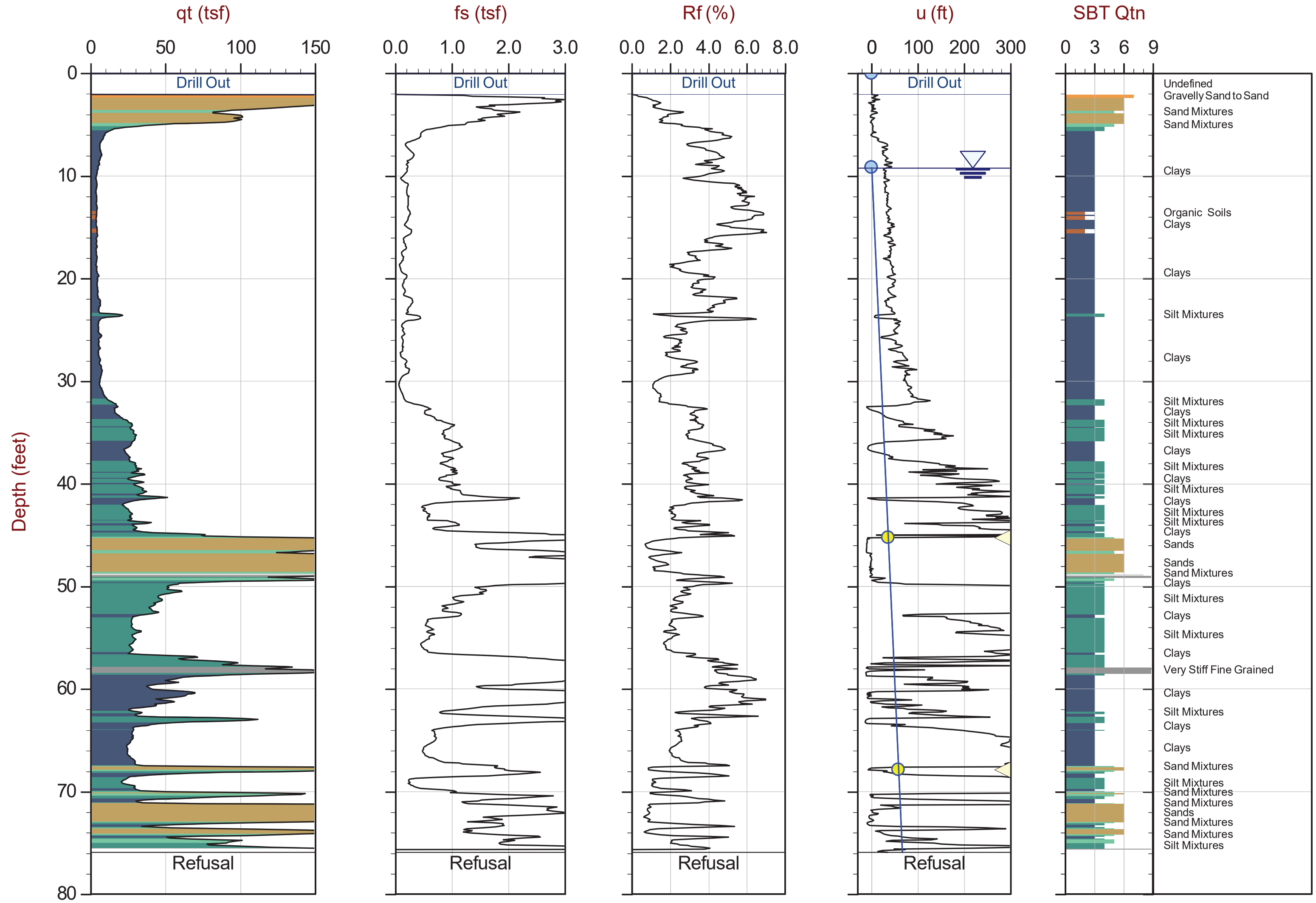
DRILL RIG EGI Mobile B-61 HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 10"									
1	6-1 L		**FILL: SANDY CLAY:** Very dark gray, fine to coarse grained sand, trace subangular gravels up to ¾" in diameter, slightly moist, hard	CI	17							
2					18							
		1			31	32		7.9			29	
3	6-2 T		**NATIVE: TERRACE DEPOSITS: SILTY SAND:** yellowish brown to brown, very fine to medium grained sand, slightly moist, dense Grading to SANDY SILT	SM	11							
					19							
4					15	34		15.6			8	
5	6-3 L		**SANDY SILT:** yellowish brown to brown, very fine to medium grained sand, slightly moist, dense	ML	18							
6		2	**SILTY SAND/ POORLY GRADED SAND:** Yellowish brown, very fine to medium grained sand, oxidation staining, slightly moist, dense	SM/ SP	30							
		1			41	37		13.1	104.0	23.0		
7												
8												
9												
10	6-4 T		**SANDY CLAY:** Mottled olive brown and yellowish brown, subhorizontal bedding, very fine to medium grained sand, oxidation staining, moist, hard	CI	12							
11					18							
					31	49		24.8		75.1	15	
12			Boring terminated at 11½ feet. Groundwater not encountered.									
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest Engineering

Job No: 19-56178
Date: 2019-11-12 13:32
Site: Lee Road Trail

Sounding: CPT-01
Cone: 443:T1500F15U500



Max Depth: 23.150 m / 75.95 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-56178_CP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N: 4084879m E: 608449m

Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Pacific Crest ENGINEERING INC

CPT-1 Standard Cone Penetration Test Plots

Lee Road Trail
Watsonville, California

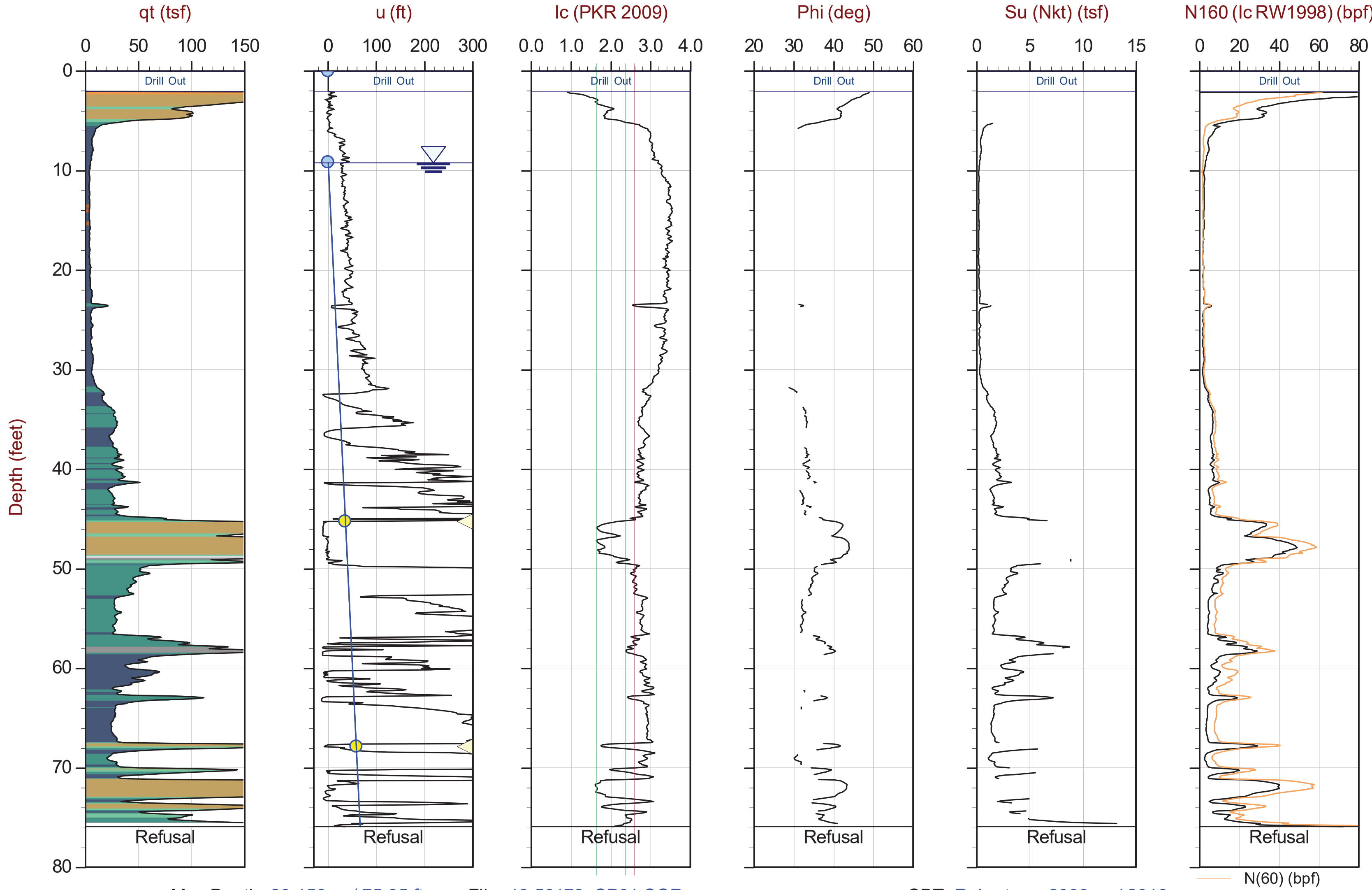
Figure No. 16
Project No. 1922
Date: 9/4/20

CONETEC

Pacific Crest Engineering

Job No: 19-56178
Date: 2019-11-12 13:32
Site: Lee Road Trail

Sounding: CPT-01
Cone: 443:T1500F15U500



Max Depth: 23.150 m / 75.95 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-56178_CP01.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 10N N: 4084879m E: 608449m

Equilibrium Pore Pressure (Ueq) · Assumed Ueq · Dissipation, Ueq achieved · Dissipation, Ueq not achieved · Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

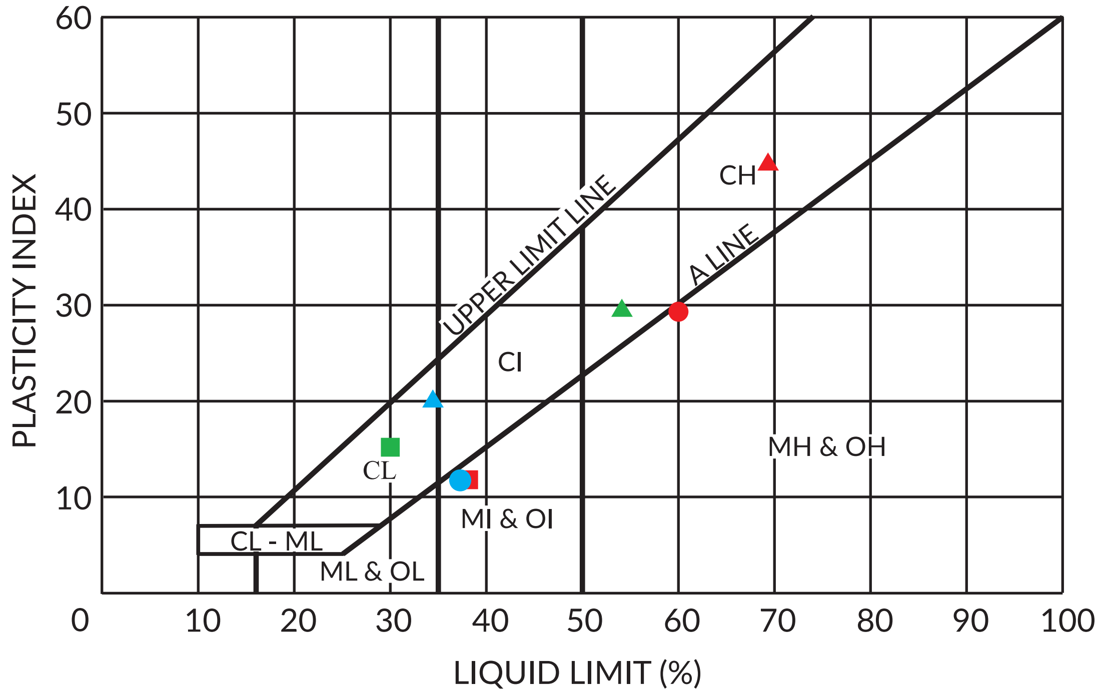
Pacific Crest ENGINEERING INC

CPT-1 Advanced Cone Penetration Test Plots
Lee Road Trail
Watsonville, California

Figure No. 17
Project No. 1922
Date: 9/4/20

ATTERBERG LIMITS - ASTM D4318

PLASTICITY CHART



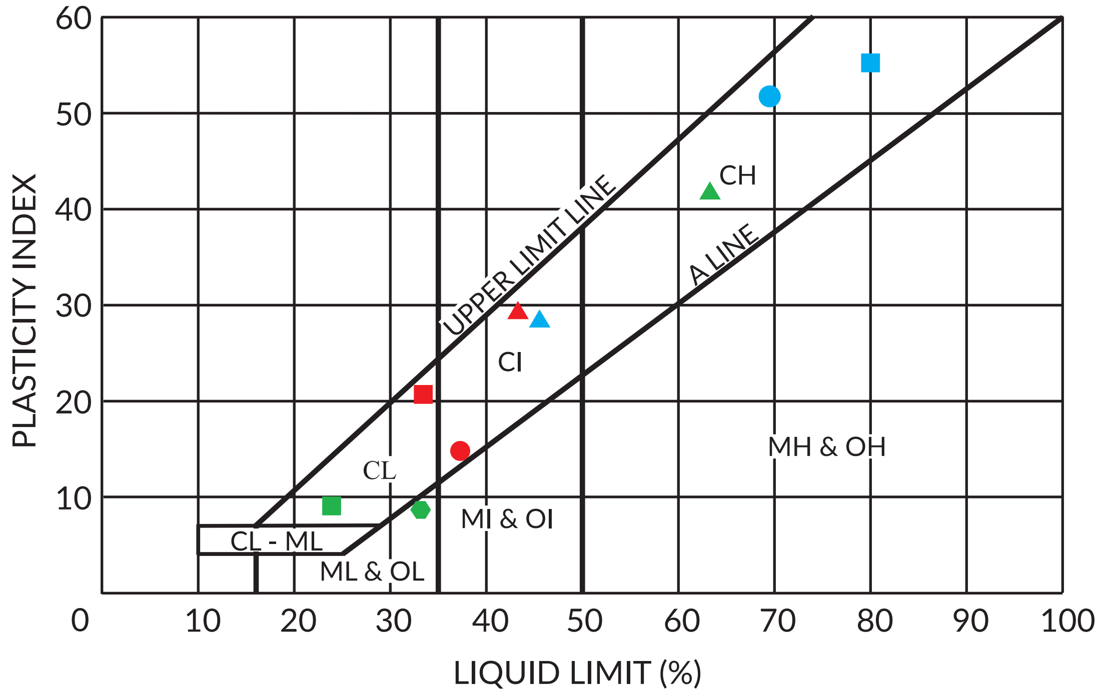
*This chart has been modified to include the intermediate classifications CI, MI and OI for clays and silts with liquid limits between 35 and 50.

SYMBOL	SAMPLE #	LL (%)	PL (%)	PI
● (red circle)	**1-2**	**60**	**31**	**29**
■ (green square)	**1-3-2**	**30**	**14**	**16**
▲ (blue triangle)	**1-4-1**	**34**	**14**	**20**
■ (red square)	**1-6**	**38**	**26**	**12**
▲ (green triangle)	**1-8**	**53**	**23**	**30**
● (blue circle)	**1-10**	**37**	**26**	**12**
▲ (red triangle)	**1-11**	**69**	**24**	**45**

Pacific Crest ENGINEERING INC	**Atterberg Limits** Lee Road Trail Watsonville, California	Figure No. 18 Project No. 1922 Date: 9/4/20

ATTERBERG LIMITS - ASTM D4318

PLASTICITY CHART



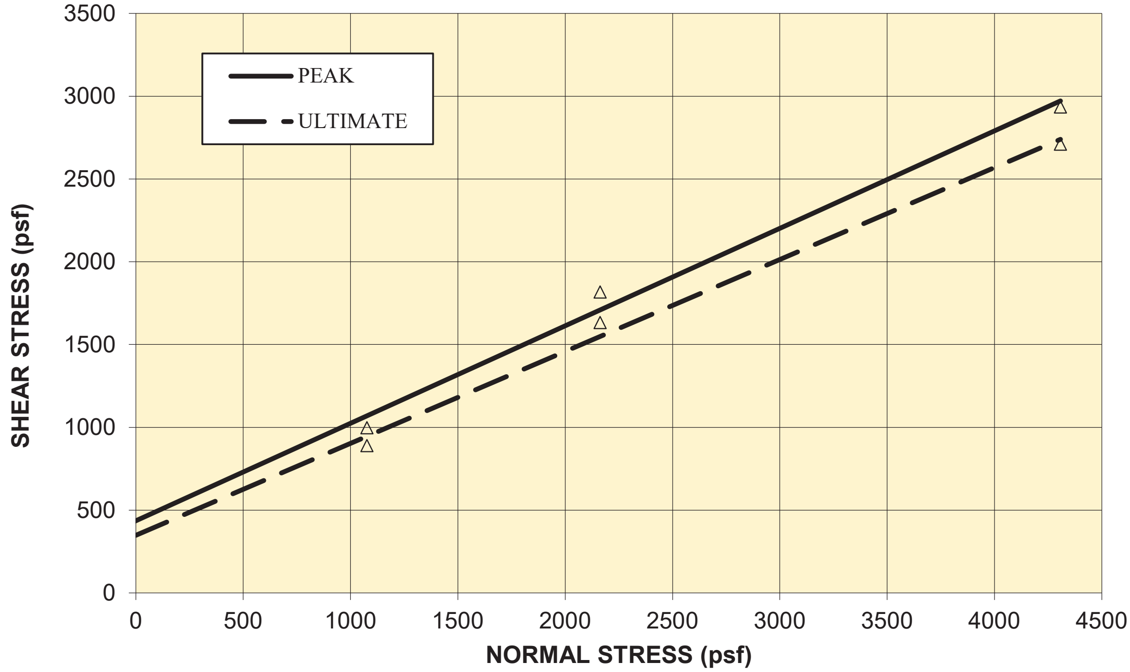
*This chart has been modified to include the intermediate classifications CI, MI and OI for clays and silts with liquid limits between 35 and 50.

SYMBOL	SAMPLE #	LL (%)	PL (%)	PI
■	**2-2**	**80**	**24**	**56**
■	**3-2**	**23**	**14**	**9**
▲	**3-6**	**46**	**19**	**28**
■	**4-2**	**33**	**12**	**21**
▲	**4-4-1**	**63**	**21**	**42**
●	**5-2**	**69**	**17**	**52**
▲	**6-1-1**	**43**	**14**	**29**
⬢	**6-2**	**33**	**25**	**8**
●	**6-4**	**37**	**23**	**15**

Pacific Crest ENGINEERING INC	**Atterberg Limits** Lee Road Trail Watsonville, California	Figure No. 19 Project No. 1922 Date: 9/4/20

DIRECT SHEAR TEST - ASTM D3080

Direct Shear Test for Soils Under Consolidated Drained Conditions



SAMPLE:	4-1-1	USCS:	SM
SOIL TYPE:	Silty Sand		

	ϕ	C (psf)
PEAK	30	430
ULTIMATE	29	340

Initial Sample Data:

Sample:	A	B	C
Sample Diameter (in):	2.41	2.41	2.41
Initial Sample Height (in):	1.000	1.000	1.000
Wet Density (pcf):	124.3	129.3	123.6
Moisture (%):	12.7%	12.3%	12.2%
Dry Density (pcf):	110.3	115.1	110.2
Void Ratio:	0.53	0.46	0.53
% Saturation:	64.9%	71.7%	62.1%

Sample Data At Test:

Normal Stress (psf):	1077	2163	4307
Sample Height at Test (in):	0.992	0.994	0.993
Wet Density (pcf):	132.2	135.9	130.9
Moisture (%):	18.0%	16.3%	17.0%
Dry Density (pcf):	112.1	116.8	111.9
Void Ratio:	0.50	0.44	0.51
% Saturation:	96.3%	99.6%	90.6%
Strain Rate (in/min):	0.0015	0.0015	0.0015
Peak Shear Stress (psf):	998	1817	2935
Ultimate Shear Stress (psf):	890	1633	2711

COOPER TESTING LABORATORY

Organic Content Test
ASTM D 2974-00 (Method C - 440 °C)

CTL JOB NO.: 416-598 **PROJECT:** Lee Rd **DATE:** 4/30/2019

CLIENT : Pacific Crest Engineering **PROJECT NO.:** 1922 **BY:** RU

Boring :								
Sample :	3-4-2	3-5						
Depth (ft.):								
Visual Description:	Dark Brown PEAT	Dark Gray Sandy CLAY						
Dish No.								
Dish wt., gm	63.68	75.76						
Soil, Org, Dish & H_2O, gm	137.46	248.00						
Oven Dry wt (105°C), gm	76.75	206.60						
Furnace Dry wt. (440°C), gm	66.32	201.82						
Moisture Content, % of Oven Dry Mass	464.5	31.6						
Organic Matter, %	79.8	3.7						

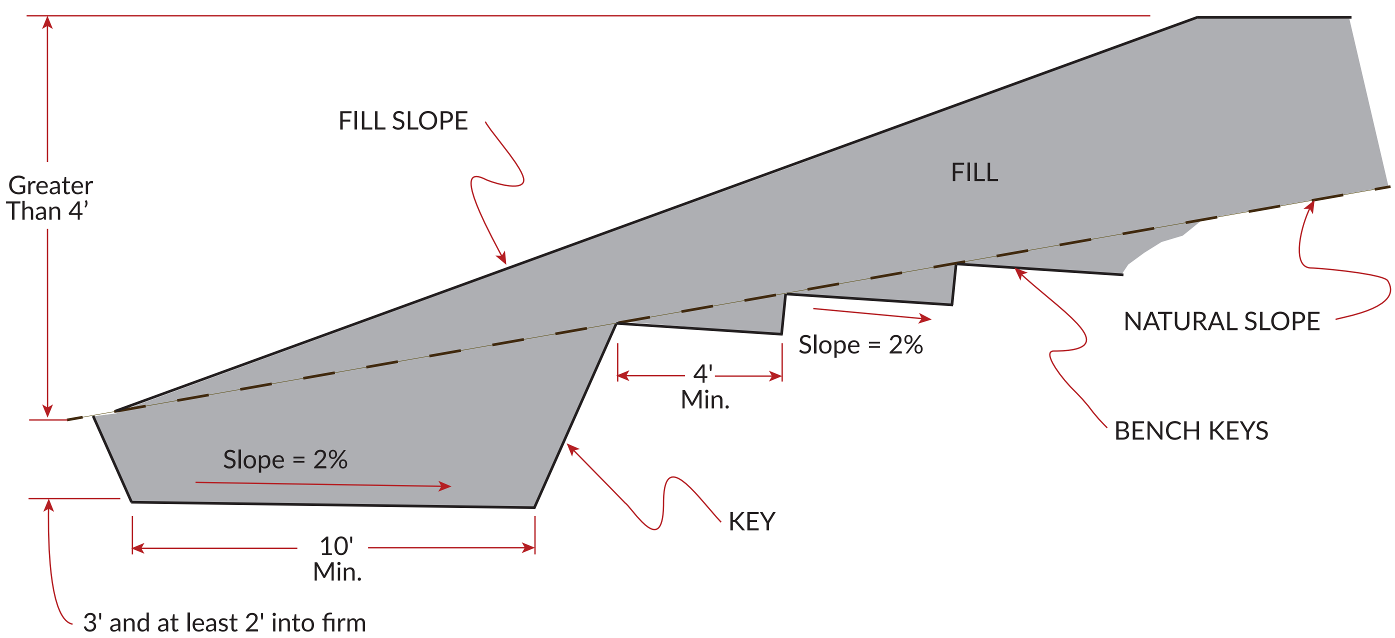
Note: ASTM provides no guidelines for including information about the organic content of a sample in the description when the wet/dry liquid limit data is not available. CTL developed the following guidelines to fill this gap:

0-5%: The organics are either not mentioned or mentioned as being "trace".
5-15%: The soil is considered as inorganic and is classified, as per ASTM 2487, with "with organics" included in the description.
15-50%: The soil is considered as organic and is described, per ASTM 2487.
> 50%: The soil is described as "Peat".

Pacific Crest ENGINEERING INC

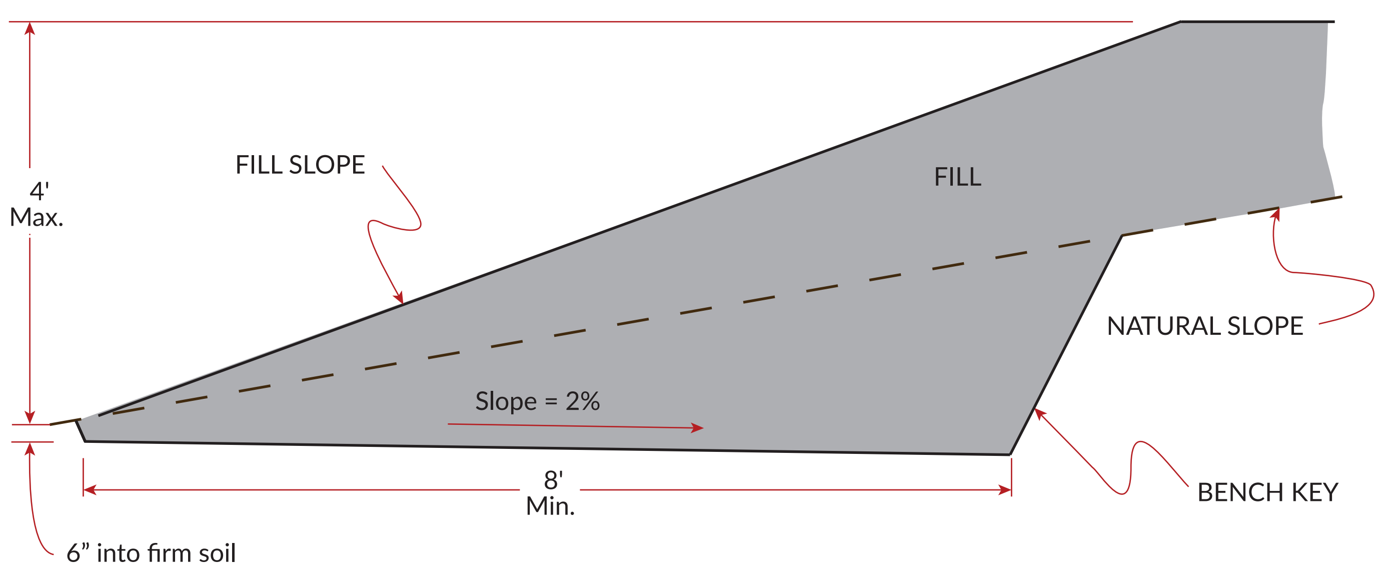
Organic Content Test
Lee Road Trail
Watsonville, California

Figure No. 21
Project No. 1922
Date: 9/4/20



TYPICAL KEYWAY FILL - FILL SLOPES GREATER THAN 4 FEET

not to scale

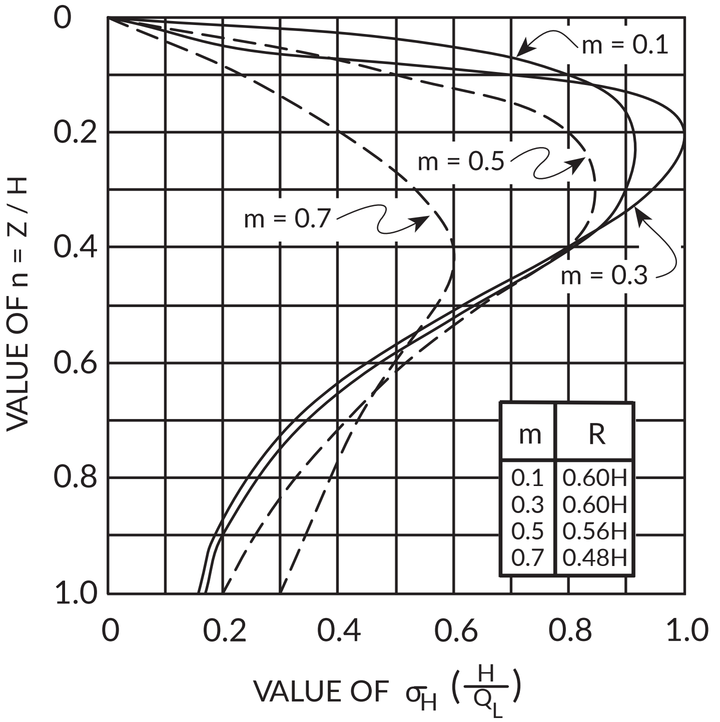


TYPICAL BENCH FILL - FILL SLOPES NO GREATER THAN 4 FEET

not to scale

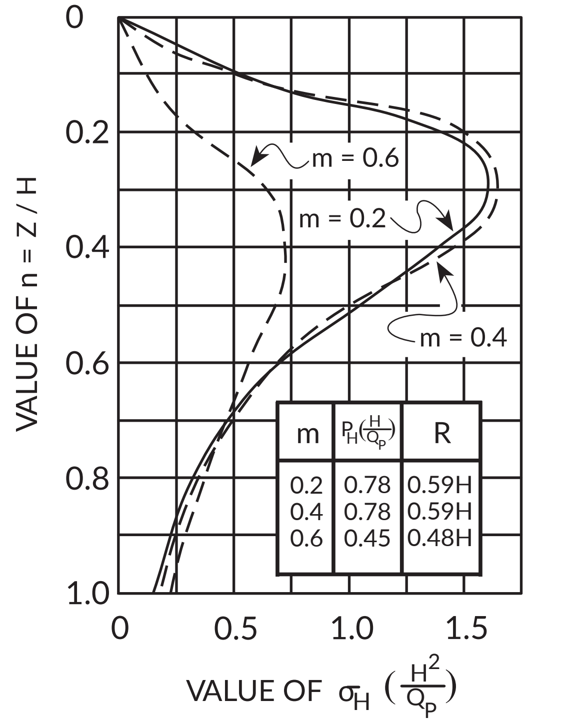
Pacific Crest ENGINEERING INC	**Typical Keyway/Bench Detail** Lee Road Trail Watsonville, California	Figure No. 22 Project No. 1922 Date: 9/4/20

LINE LOAD

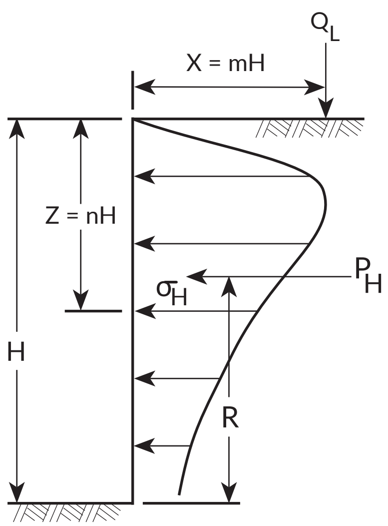


m	R
0.1	0.60H
0.3	0.60H
0.5	0.56H
0.7	0.48H

POINT LOAD



m	$P_H\left(\frac{H}{Q_P}\right)$	R
0.2	0.78	0.59H
0.4	0.78	0.59H
0.6	0.45	0.48H



FOR m ≦ 0.4:

$$\sigma_H \left(\frac{H}{Q_L}\right) = \frac{0.20\,n}{(0.16 + n^2)^2}$$

$$P_H = 0.55 Q_L$$

FOR m > 0.4:

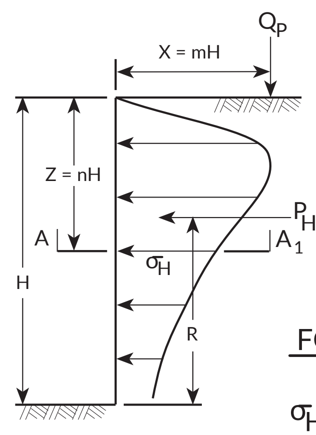
$$\sigma_H \left(\frac{H}{Q_L}\right) = \frac{1.28\,m^2 n}{(m^2 + n^2)^2}$$

$$\text{RESULTANT} \quad P_H = \frac{0.64\,Q_L}{(m^2 + 1)}$$

PRESSURES FROM LINE LOAD Q_L

(BOUSSINESQ EQUATION MODIFIED BY

REFERENCE: Design Manual
NAVFAC DM-7.02
Figure 11
Page 7.2-74



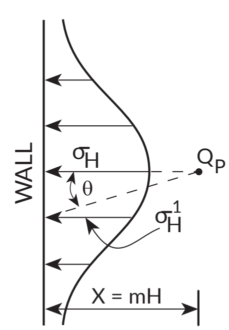
FOR m ≦ 0.4:

$$\sigma_H \left(\frac{H^2}{Q_P}\right) = \frac{0.28\,n^2}{(0.16 + n^2)^3}$$

FOR m > 0.4:

$$\sigma_H \left(\frac{H^2}{Q_P}\right) = \frac{1.77\,m^2 n^2}{(m^2 + n^2)^3}$$

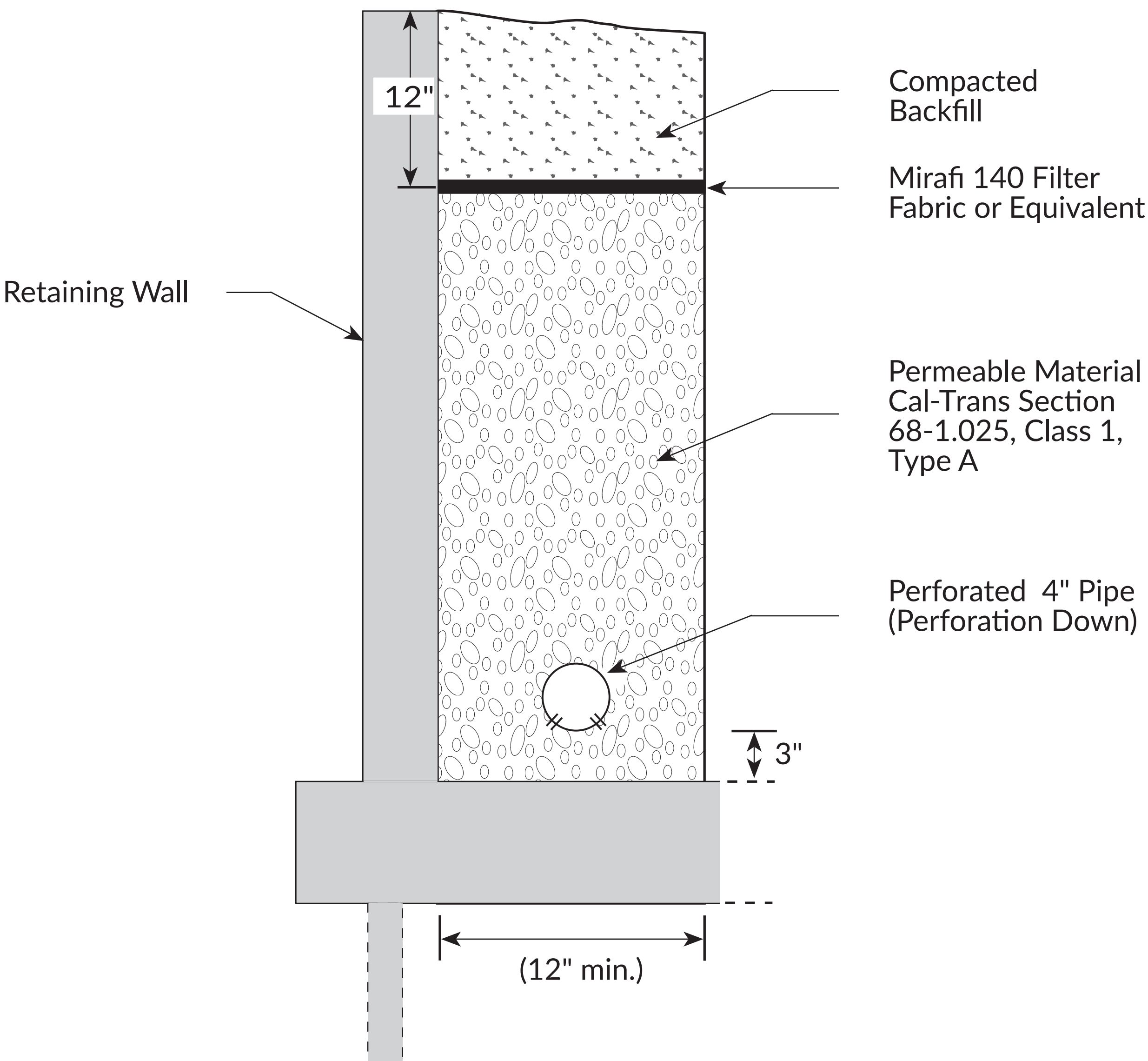
$$\sigma_H^1 = \sigma_H \cos^2(1.1\,q)$$



SECTION A-A_1

PRESSURES FROM POINT LOAD Q_P

(BOUSSINESQ EQUATION
MODIFIED



Not to Scale

Pacific Crest ENGINEERING INC	**Typical Retaining Wall Drain Detail** Lee Road Trail Watsonville, California	Figure No. 24 Project No. 1922 Date: 9/4/20

APPENDIX B

Quantitative Liquefaction Analysis

GEOLOGISMIKI Geotechnical Software

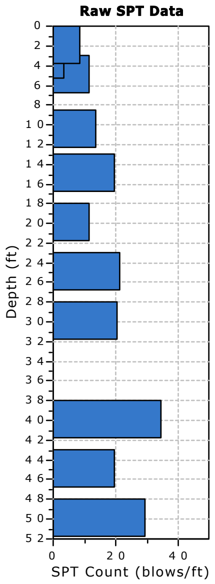
SPT BASED LIQUEFACTION ANALYSIS REPORT

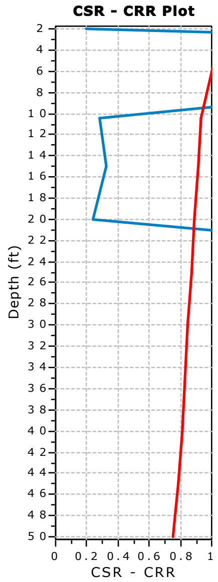
Project title : Lee Road South Abutment **SPT Name: Boring B-1**

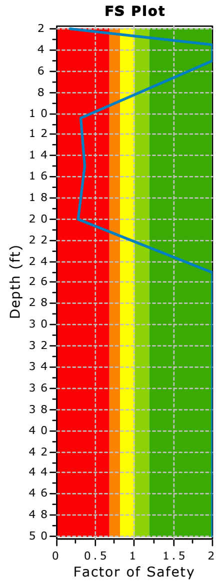
Location :

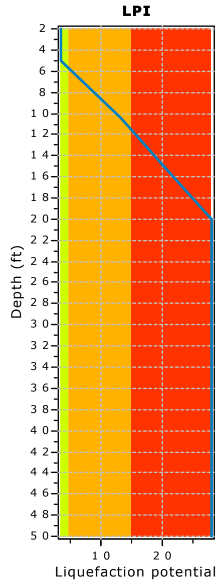
:: Input parameters and analysis properties ::

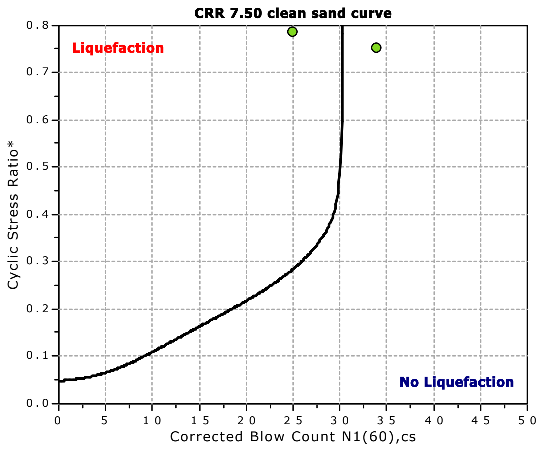
Analysis method:	NCEER 1998	G.W.T. (in-situ):	0.00 ft
Fines correction method:	NCEER 1998	G.W.T. (earthq.):	0.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	7.90
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.63 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		







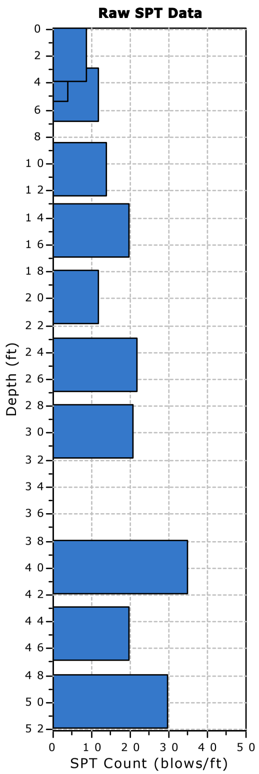


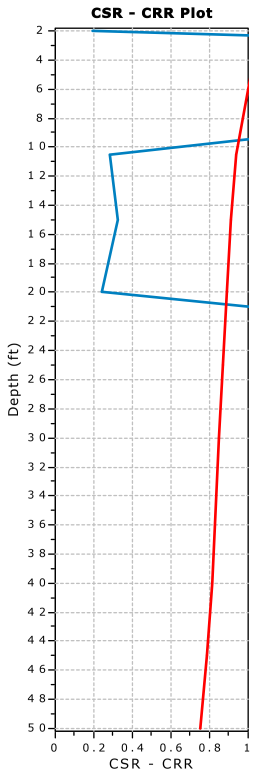


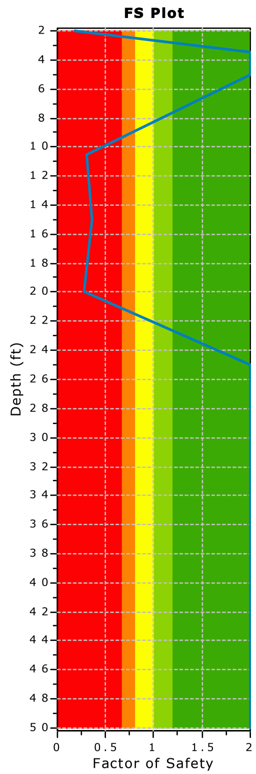
F.S. color scheme
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

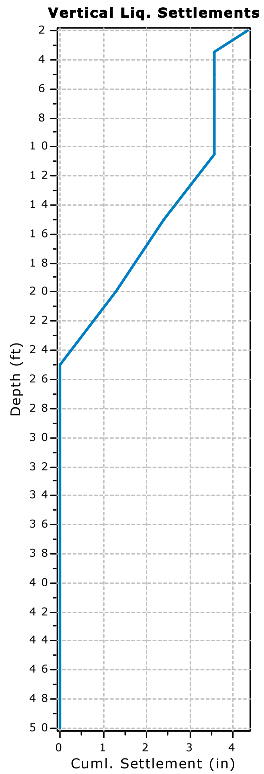
LPI color scheme
- Very high risk
- High risk
- Low risk

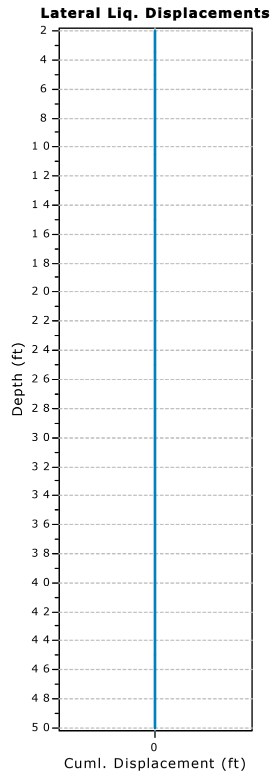
:: Overall Liquefaction Assessment Analysis Plots ::











:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
2.00	9	50.00	109.00	2.50	Yes
3.50	4	50.00	109.00	2.50	No
5.00	12	68.00	128.00	5.00	No
10.50	14	33.00	129.00	5.00	Yes
15.00	20	15.00	129.00	5.00	Yes
20.00	12	93.00	129.00	5.00	Yes
25.00	22	99.00	129.00	5.00	No
30.00	21	99.00	129.00	10.00	No
40.00	35	55.00	129.00	5.00	Yes
45.00	20	99.00	129.00	5.00	No
50.00	30	99.00	129.00	5.00	No

Abbreviations

Depth:	Depth at which test was performed (ft)
SPT Field Value:	Number of blows per foot
Fines Content:	Fines content at test depth (%)
Unit Weight:	Unit weight at test depth (pcf)
Infl. Thickness:	Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy:	User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$
2.00	9	109.00	0.11	0.06	0.05	1.70	1.00	1.00	0.75	1.00	11	50.00	5.00	1.20	18	0.196
3.50	4	109.00	0.19	0.11	0.08	1.70	1.00	1.00	0.75	1.00	5	50.00	5.00	1.20	11	4.000
5.00	12	128.00	0.29	0.16	0.13	1.66	1.00	1.00	0.75	1.00	15	68.00	5.00	1.20	23	4.000
10.50	14	129.00	0.64	0.33	0.31	1.47	1.00	1.00	0.85	1.00	17	33.00	4.88	1.18	25	0.285
15.00	20	129.00	0.93	0.47	0.46	1.34	1.00	1.00	0.85	1.00	23	15.00	2.50	1.05	27	0.323
20.00	12	129.00	1.25	0.62	0.63	1.23	1.00	1.00	0.95	1.00	14	93.00	5.00	1.20	22	0.242
25.00	22	129.00	1.58	0.78	0.80	1.13	1.00	1.00	0.95	1.00	24	99.00	5.00	1.20	34	4.000
30.00	21	129.00	1.90	0.94	0.96	1.04	1.00	1.00	1.00	1.00	22	99.00	5.00	1.20	31	4.000
40.00	35	129.00	2.54	1.25	1.30	0.91	1.00	1.00	1.00	1.00	32	55.00	5.00	1.20	43	4.000
45.00	20	129.00	2.87	1.40	1.46	0.85	1.00	1.00	1.00	1.00	17	99.00	5.00	1.20	25	4.000
50.00	30	129.00	3.19	1.56	1.63	0.80	1.00	1.00	1.00	1.00	24	99.00	5.00	1.20	34	4.000

Abbreviations

σ_v:	Total stress during SPT test (tsf)
u_o:	Water pore pressure during SPT test (tsf)
σ'_{vo}:	Effective overburden pressure during SPT test (tsf)
C_N:	Overburden corretion factor
C_E:	Energy correction factor
C_B:	Borehole diameter correction factor
C_R:	Rod length correction factor
C_S:	Liner correction factor
$N_{1(60)}$:	Corrected N_{SPT} to a 60% energy ratio
α, β:	Clean sand equivalent clean sand formula coefficients
$N_{1(60)cs}$:	Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$:	Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
2.00	109.00	0.11	0.06	0.05	1.00	1.00	0.955	0.88	1.092	1.00	1.092	0.179	●
3.50	109.00	0.19	0.11	0.08	0.99	1.00	0.952	0.88	1.088	1.00	1.088	2.000	●
5.00	128.00	0.29	0.16	0.13	0.99	1.00	0.889	0.88	1.016	1.00	1.016	2.000	●
10.50	129.00	0.64	0.33	0.31	0.98	1.00	0.819	0.88	0.935	1.00	0.935	0.305	●
15.00	129.00	0.93	0.47	0.46	0.97	1.00	0.797	0.88	0.911	1.00	0.911	0.355	●
20.00	129.00	1.25	0.62	0.63	0.96	1.00	0.780	0.88	0.891	1.00	0.891	0.271	●
25.00	129.00	1.58	0.78	0.80	0.94	1.00	0.763	0.88	0.872	1.00	0.872	2.000	●
30.00	129.00	1.90	0.94	0.96	0.92	1.00	0.743	0.88	0.849	1.00	0.849	2.000	●
40.00	129.00	2.54	1.25	1.30	0.85	1.00	0.684	0.88	0.782	0.96	0.814	2.000	●
45.00	129.00	2.87	1.40	1.46	0.80	1.00	0.645	0.88	0.737	0.94	0.786	2.000	●
50.00	129.00	3.19	1.56	1.63	0.75	1.00	0.603	0.88	0.689	0.92	0.752	2.000	●

Abbreviations

$\sigma_{v,eq}$:	Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$:	Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$:	Effective overburden pressure, during earthquake (tsf)
r_d :	Nonlinear shear mass factor
α:	Improvement factor due to stone columns
CSR :	Cyclic Stress Ratio (adjusted for improvement)
MSF :	Magnitude Scaling Factor
$CSR_{eq,M=7.5}$:	CSR adjusted for M=7.5
K_{sigma}:	Effective overburden stress factor
CSR^*:	CSR fully adjusted
FS:	Calculated factor of safety against soil liquefaction

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
2.00	0.179	0.82	9.70	1.50	3.64
3.50	2.000	0.00	9.47	1.50	0.00
5.00	2.000	0.00	9.24	1.50	0.00
10.50	0.305	0.70	8.40	5.50	9.79
15.00	0.355	0.65	7.71	4.50	6.83
20.00	0.271	0.73	6.95	5.00	7.72
25.00	2.000	0.00	6.19	5.00	0.00
30.00	2.000	0.00	5.43	5.00	0.00
40.00	2.000	0.00	3.90	10.00	0.00
45.00	2.000	0.00	3.14	5.00	0.00
50.00	2.000	0.00	2.38	5.00	0.00

Overall potential I_L : 27.98

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v (%)	Δh (ft)	s (in)
2.00	0.00	5.00	2.55	2.50	0.764
3.50	0.00	5.00	0.00	2.50	0.000

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v (%)	Δh (ft)	s (in)
5.00	0.00	5.00	0.00	5.00	0.000
10.50	0.00	5.00	1.95	5.00	1.168
15.00	0.00	5.00	1.83	5.00	1.096
20.00	0.00	5.00	2.16	5.00	1.297
25.00	0.00	5.00	0.00	5.00	0.000
30.00	0.00	5.00	0.00	10.00	0.000
40.00	0.00	5.00	0.00	5.00	0.000
45.00	0.00	5.00	0.00	5.00	0.000
50.00	0.00	5.00	0.00	5.00	0.000

Cumulative settlements: 4.325

Abbreviations

D_{50}: Median grain size (in)
q_c/N: Ratio of cone resistance to SPT
e_v: Post liquefaction volumetric strain (%)
Δh: Thickness of soil layer to be considered (ft)
s: Estimated settlement (in)

:: Lateral displacements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60}$	D_r (%)	γ_{max} (%)	d_z (ft)	LDI	LD (ft)
2.00	11	46.43	34.10	2.50	0.000	0.00
3.50	5	31.30	0.00	2.50	0.000	0.00
5.00	15	54.22	0.00	5.00	0.000	0.00
10.50	17	57.72	22.70	5.00	0.000	0.00
15.00	23	67.14	14.50	5.00	0.000	0.00
20.00	14	52.38	34.10	5.00	0.000	0.00
25.00	24	68.59	0.00	5.00	0.000	0.00
30.00	22	65.67	0.00	10.00	0.000	0.00
40.00	32	79.20	0.00	5.00	0.000	0.00
45.00	17	57.72	0.00	5.00	0.000	0.00
50.00	24	68.59	0.00	5.00	0.000	0.00

Cumulative lateral displacements: 0.00

Abbreviations

D_r: Relative density (%)
γ_{max}: Maximum amplitude of cyclic shear strain (%)
d_z: Soil layer thickness (ft)
LDI: Lateral displacement index (ft)
LD: Actual estimated displacement (ft)

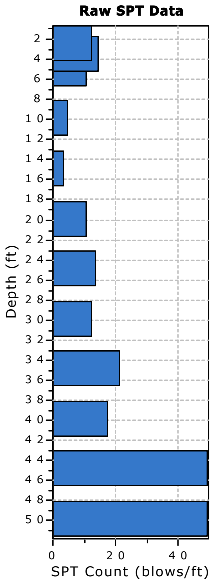
SPT BASED LIQUEFACTION ANALYSIS REPORT

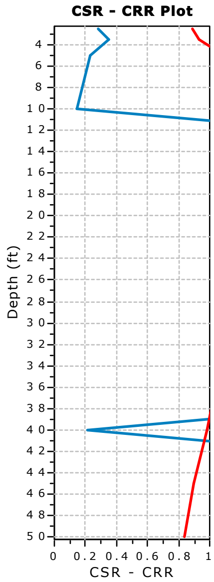
Project title : Lee Road South Abutment **SPT Name: Boring B-3**

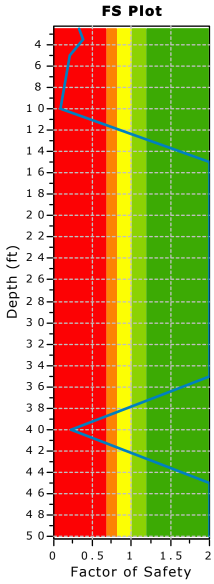
Location :

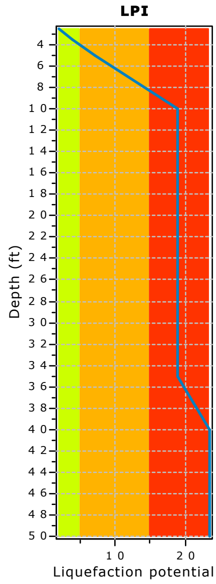
:: Input parameters and analysis properties ::

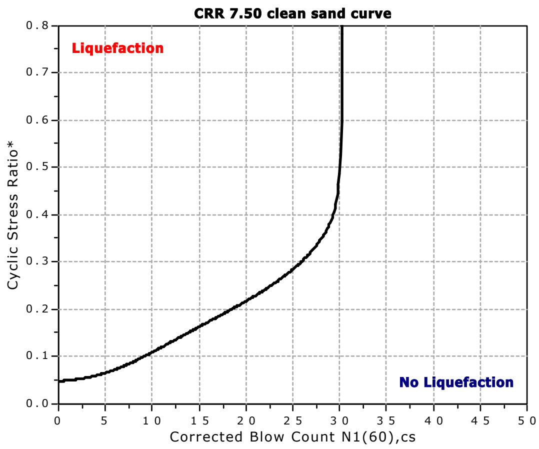
Analysis method:	NCEER 1998	G.W.T. (in-situ):	0.00 ft
Fines correction method:	NCEER 1998	G.W.T. (earthq.):	0.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	7.90
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.63 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		











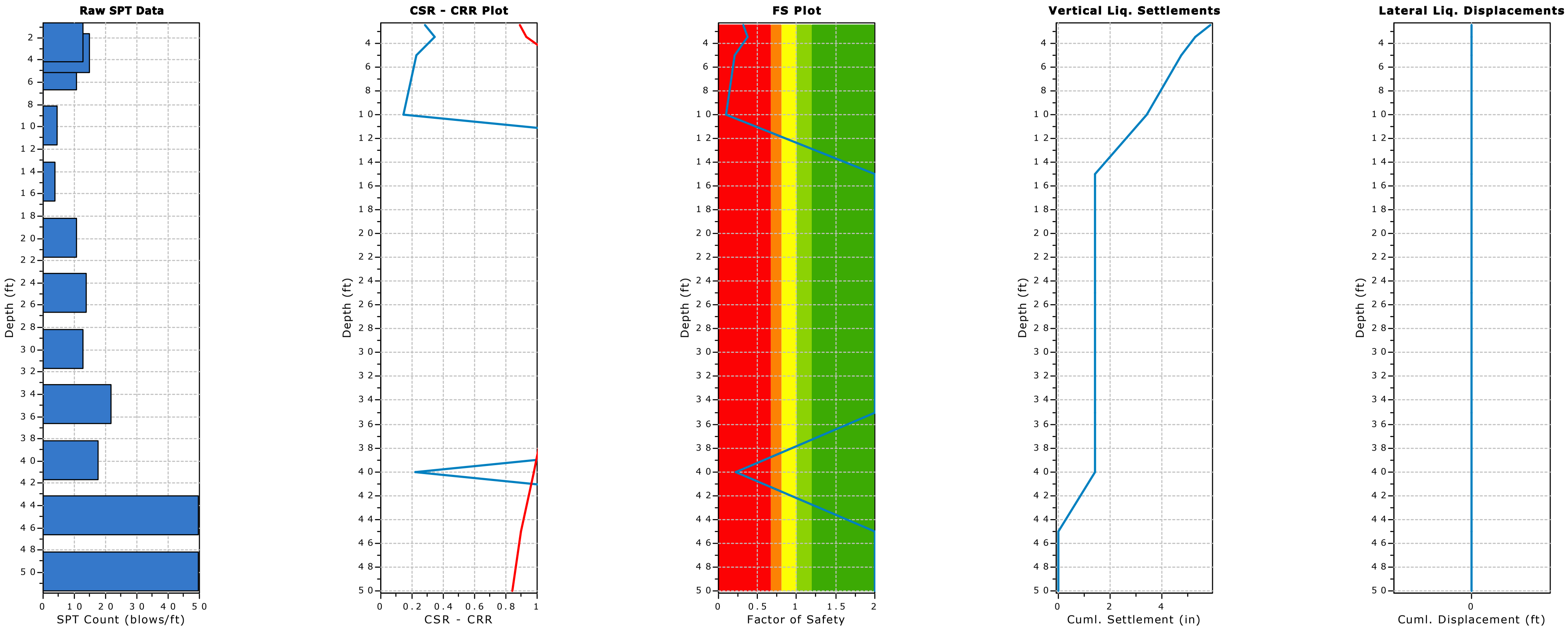
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
2.50	13	40.00	130.70	2.50	Yes
3.50	15	50.00	109.00	2.50	Yes
5.00	11	31.30	70.00	5.00	Yes
10.00	5	31.30	70.00	5.00	Yes
15.00	4	60.00	109.00	5.00	No
20.00	11	60.00	109.00	5.00	No
25.00	14	74.00	109.00	5.00	No
30.00	13	74.00	109.00	5.00	No
35.00	22	74.00	109.00	5.00	No
40.00	18	5.00	118.00	5.00	Yes
45.00	50	5.00	125.00	5.00	Yes
50.00	50	5.00	125.00	5.00	Yes

Abbreviations

Depth: Depth at which test was performed (ft)
SPT Field Value: Number of blows per foot
Fines Content: Fines content at test depth (%)
Unit Weight: Unit weight at test depth (pcf)
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$
2.50	13	130.70	0.16	0.08	0.09	1.70	1.00	1.00	0.75	1.00	17	40.00	5.00	1.20	25	0.285
3.50	15	109.00	0.22	0.11	0.11	1.69	1.00	1.00	0.75	1.00	19	50.00	5.00	1.20	28	0.348
5.00	11	70.00	0.27	0.16	0.11	1.68	1.00	1.00	0.75	1.00	14	31.30	4.79	1.17	21	0.229
10.00	5	70.00	0.45	0.31	0.13	1.66	1.00	1.00	0.85	1.00	7	31.30	4.79	1.17	13	0.142
15.00	4	109.00	0.72	0.47	0.25	1.53	1.00	1.00	0.85	1.00	5	60.00	5.00	1.20	11	4.000
20.00	11	109.00	0.99	0.62	0.37	1.42	1.00	1.00	0.95	1.00	15	60.00	5.00	1.20	23	4.000
25.00	14	109.00	1.26	0.78	0.48	1.33	1.00	1.00	0.95	1.00	18	74.00	5.00	1.20	27	4.000
30.00	13	109.00	1.54	0.94	0.60	1.25	1.00	1.00	1.00	1.00	16	74.00	5.00	1.20	24	4.000
35.00	22	109.00	1.81	1.09	0.72	1.17	1.00	1.00	1.00	1.00	26	74.00	5.00	1.20	36	4.000
40.00	18	118.00	2.10	1.25	0.85	1.10	1.00	1.00	1.00	1.00	20	5.00	0.00	1.00	20	0.218
45.00	50	125.00	2.42	1.40	1.01	1.02	1.00	1.00	1.00	1.00	51	5.00	0.00	1.00	51	4.000
50.00	50	125.00	2.73	1.56	1.17	0.95	1.00	1.00	1.00	1.00	48	5.00	0.00	1.00	48	4.000

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
α, β: Clean sand equivalent clean sand formula coefficients
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS
2.50	130.70	0.16	0.08	0.09	1.00	1.00	0.781	0.88	0.892	1.00	0.892	0.320
3.50	109.00	0.22	0.11	0.11	0.99	1.00	0.816	0.88	0.932	1.00	0.932	0.373
5.00	70.00	0.27	0.16	0.11	0.99	1.00	0.959	0.88	1.095	1.00	1.095	0.209
10.00	70.00	0.45	0.31	0.13	0.98	1.00	1.339	0.88	1.530	1.00	1.530	0.093
15.00	109.00	0.72	0.47	0.25	0.97	1.00	1.139	0.88	1.302	1.00	1.302	2.000
20.00	109.00	0.99	0.62	0.37	0.96	1.00	1.059	0.88	1.210	1.00	1.210	2.000
25.00	109.00	1.26	0.78	0.48	0.94	1.00	1.009	0.88	1.153	1.00	1.153	2.000
30.00	109.00	1.54	0.94	0.60	0.92	1.00	0.966	0.88	1.103	1.00	1.103	2.000
35.00	109.00	1.81	1.09	0.72	0.89	1.00	0.921	0.88	1.052	1.00	1.052	2.000
40.00	118.00	2.10	1.25	0.85	0.85	1.00	0.857	0.88	0.980	1.00	0.980	0.222
45.00	125.00	2.42	1.40	1.01	0.80	1.00	0.786	0.88	0.898	1.00	0.898	2.000
50.00	125.00	2.73	1.56	1.17	0.75	1.00	0.720	0.88	0.823	0.98	0.839	2.000

Abbreviations

$\sigma_{v,eq}$:	Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$:	Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$:	Effective overburden pressure, during earthquake (tsf)
r_d :	Nonlinear shear mass factor
α:	Improvement factor due to stone columns
CSR :	Cyclic Stress Ratio (adjusted for improvement)
MSF :	Magnitude Scaling Factor
$CSR_{eq,M=7.5}$:	CSR adjusted for M=7.5
K_{sigma}:	Effective overburden stress factor
CSR^*:	CSR fully adjusted
FS:	Calculated factor of safety against soil liquefaction

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
2.50	0.320	0.68	9.62	1.00	1.99
3.50	0.373	0.63	9.47	1.00	1.81
5.00	0.209	0.79	9.24	1.50	3.34
10.00	0.093	0.91	8.48	5.00	11.72
15.00	2.000	0.00	7.71	5.00	0.00
20.00	2.000	0.00	6.95	5.00	0.00
25.00	2.000	0.00	6.19	5.00	0.00
30.00	2.000	0.00	5.43	5.00	0.00
35.00	2.000	0.00	4.67	5.00	0.00
40.00	0.222	0.78	3.90	5.00	4.63
45.00	2.000	0.00	3.14	5.00	0.00
50.00	2.000	0.00	2.38	5.00	0.00

Overall potential I_L : 23.49

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v (%)	Δh (ft)	s (in)

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v (%)	Δh (ft)	s (in)
2.50	0.00	5.00	1.95	2.50	0.584
3.50	0.00	5.00	1.77	2.50	0.532
5.00	0.00	5.00	2.25	5.00	1.347
10.00	0.00	5.00	3.33	5.00	1.996
15.00	0.00	5.00	0.00	5.00	0.000
20.00	0.00	5.00	0.00	5.00	0.000
25.00	0.00	5.00	0.00	5.00	0.000
30.00	0.00	5.00	0.00	5.00	0.000
35.00	0.00	5.00	0.00	5.00	0.000
40.00	0.00	5.00	2.34	5.00	1.402
45.00	0.00	5.00	0.00	5.00	0.000
50.00	0.00	5.00	0.00	5.00	0.000

Cumulative settlements: 5.861

Abbreviations

D_{50}: Median grain size (in)
q_c/N: Ratio of cone resistance to SPT
e_v: Post liquefaction volumetric strain (%)
Δh: Thickness of soil layer to be considered (ft)
s: Estimated settlement (in)

:: Lateral displacements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60}$	D_r (%)	γ_{max} (%)	d_z (ft)	LDI	LD (ft)
2.50	17	57.72	22.70	2.50	0.000	0.00
3.50	19	61.02	22.70	2.50	0.000	0.00
5.00	14	52.38	34.10	5.00	0.000	0.00
10.00	7	37.04	51.20	5.00	0.000	0.00
15.00	5	31.30	0.00	5.00	0.000	0.00
20.00	15	54.22	0.00	5.00	0.000	0.00
25.00	18	59.40	0.00	5.00	0.000	0.00
30.00	16	56.00	0.00	5.00	0.000	0.00
35.00	26	71.39	0.00	5.00	0.000	0.00
40.00	20	62.61	22.70	5.00	0.000	0.00
45.00	51	100.00	0.00	5.00	0.000	0.00
50.00	48	100.00	0.00	5.00	0.000	0.00

Cumulative lateral displacements: 0.00

Abbreviations

D_r: Relative density (%)
γ_{max}: Maximum amplitude of cyclic shear strain (%)
d_z: Soil layer thickness (ft)
LDI: Lateral displacement index (ft)
LD: Actual estimated displacement (ft)

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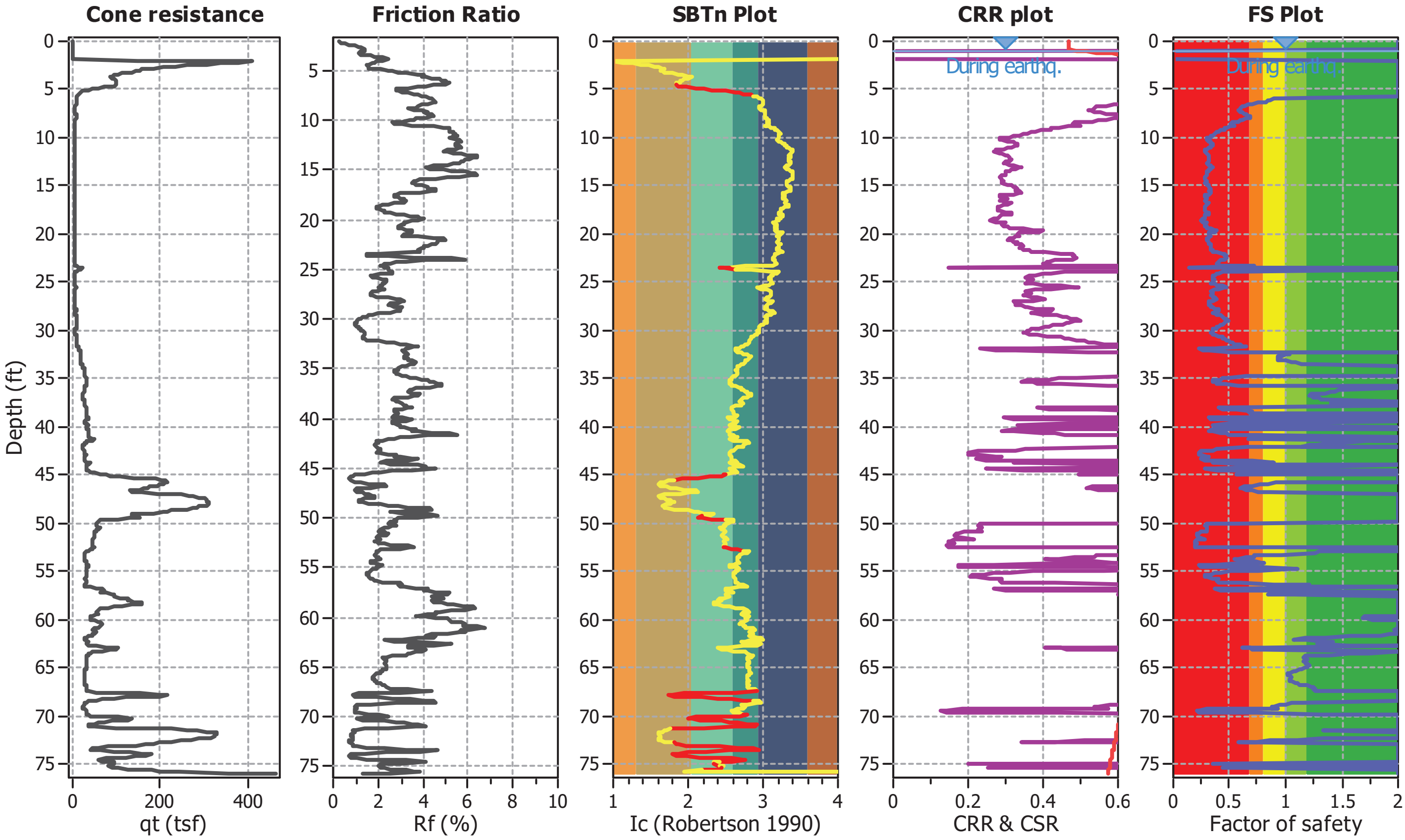
LIQUEFACTION ANALYSIS REPORT

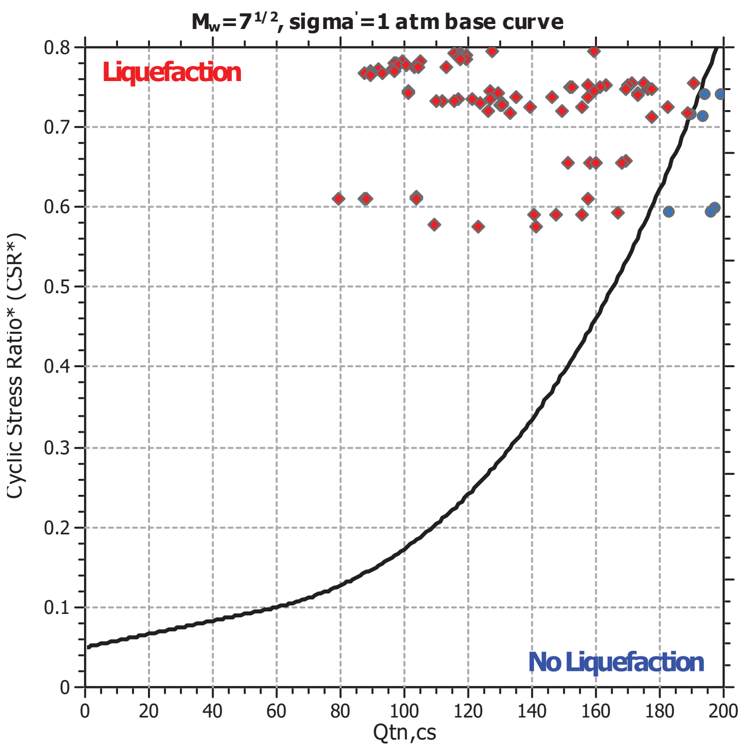
Project title : **Location :**

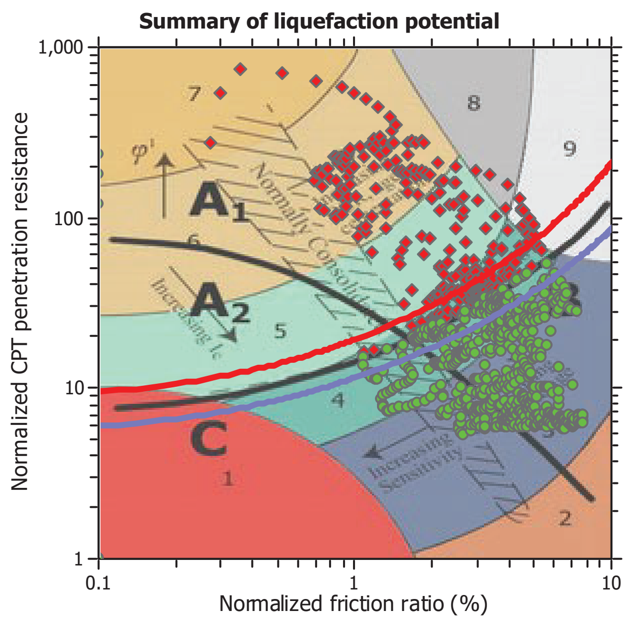
CPT file : CPT-1 Sta ~ 8+45

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	1.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.63	Unit weight calculation:	Based on SBT	K_σ applied:	No		

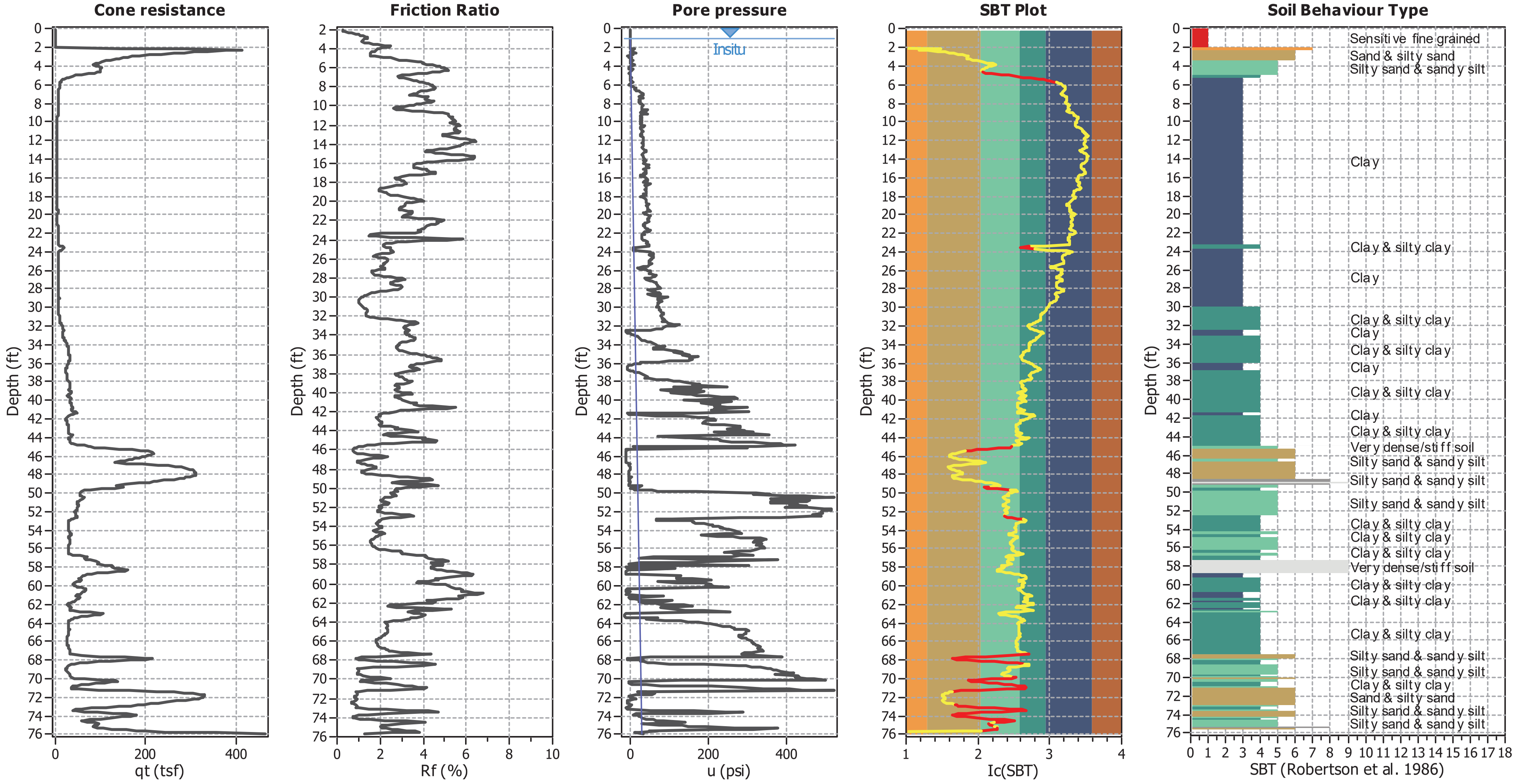






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



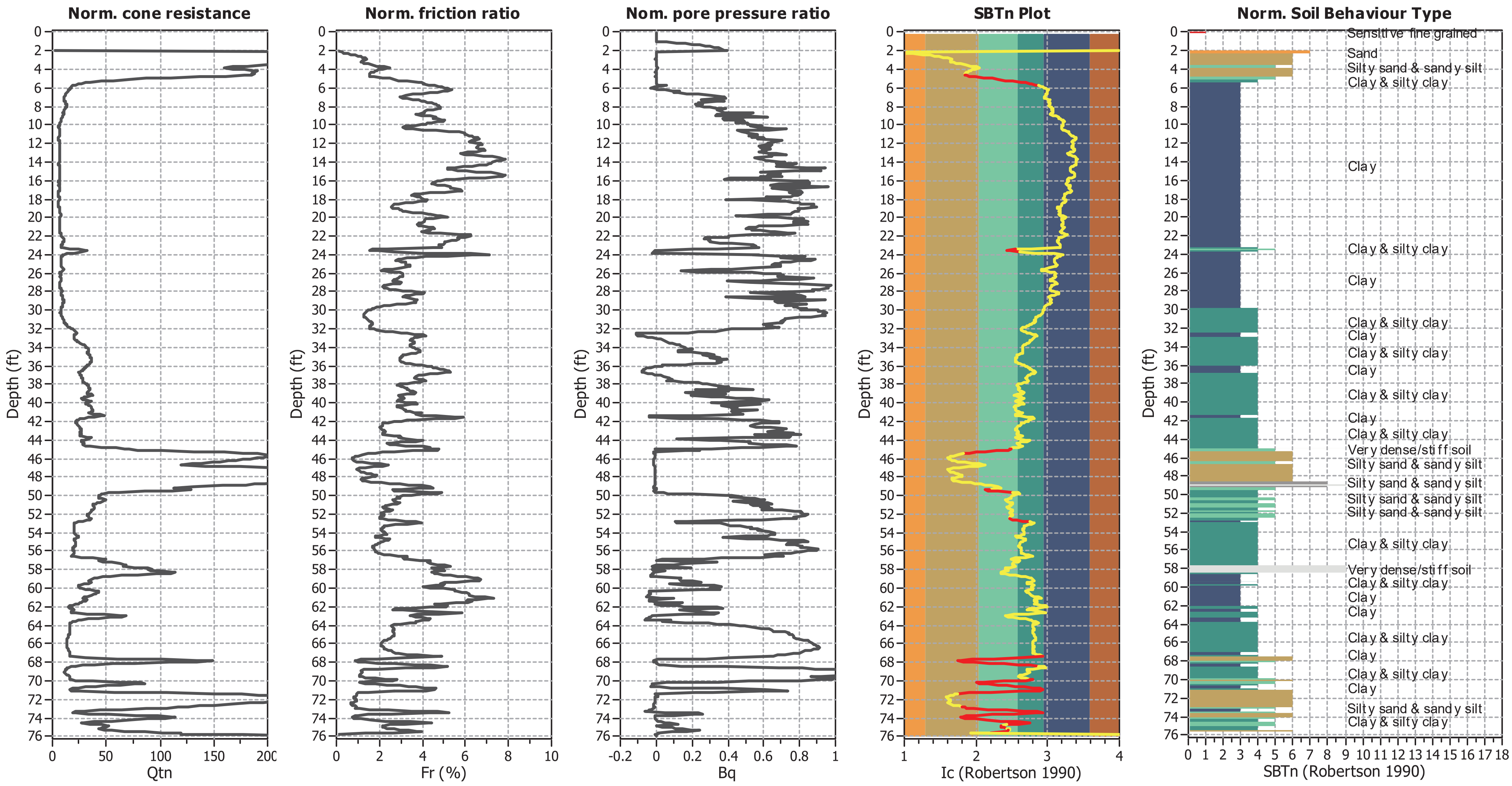
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	1.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.63	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



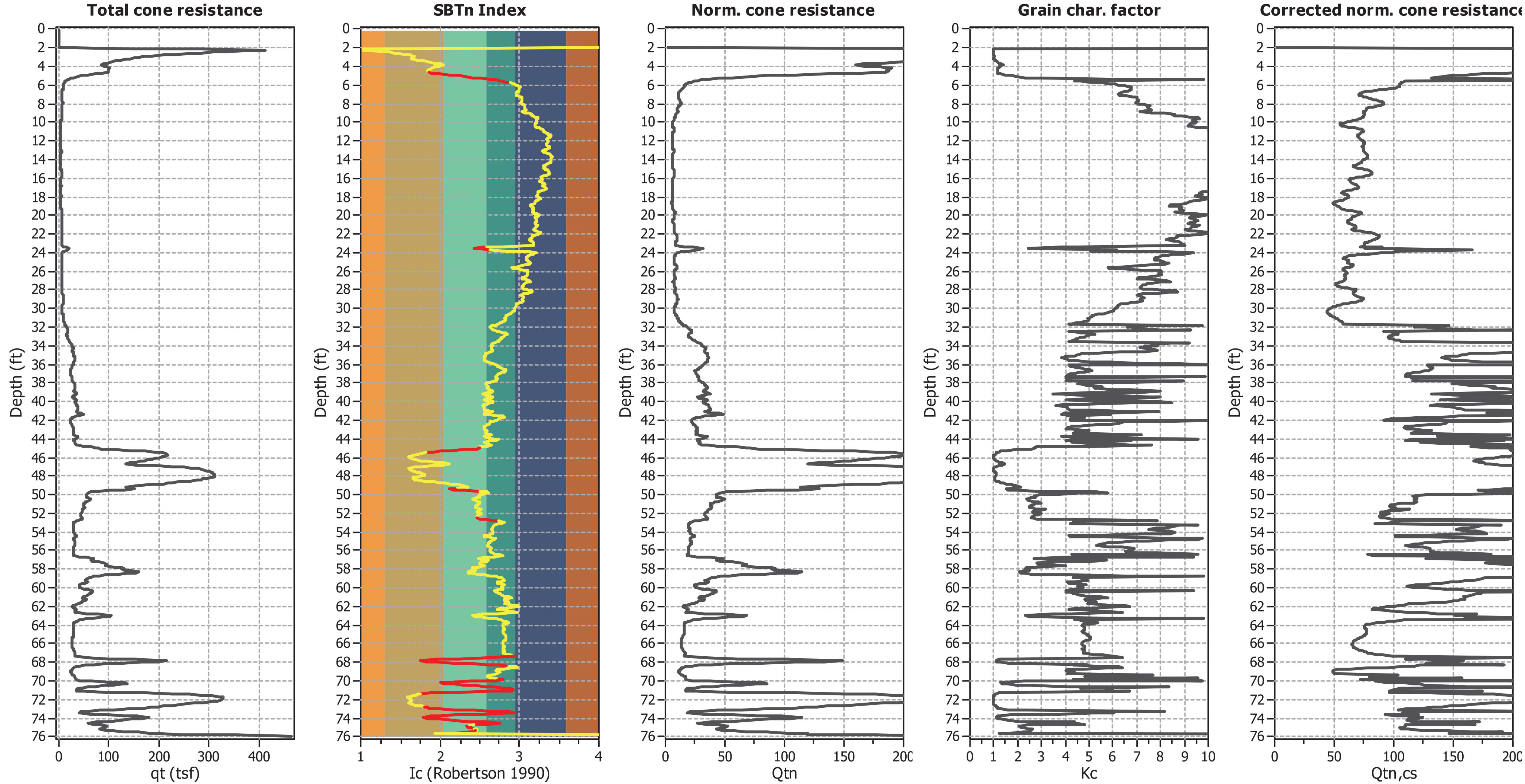
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	1.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.63	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots (intermediate results)



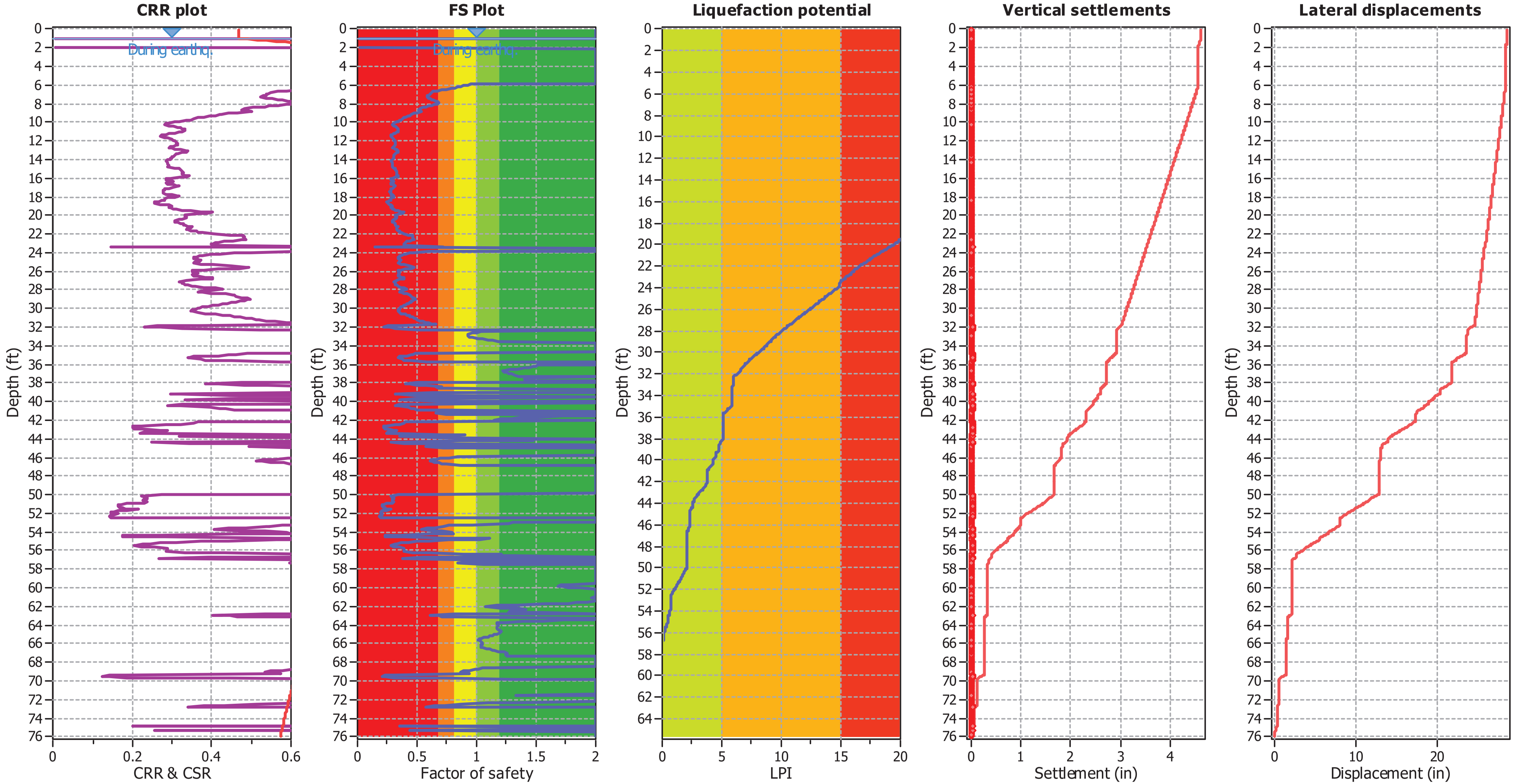
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	1.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.63	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 ft	Fill height:	N/A	Limit depth:	N/A

This software is licensed to: Pacific Crest Engineering

CPT name: CPT-1 Sta ~ 8+45

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	1.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.63	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 ft	Fill height:	N/A	Limit depth:	N/A

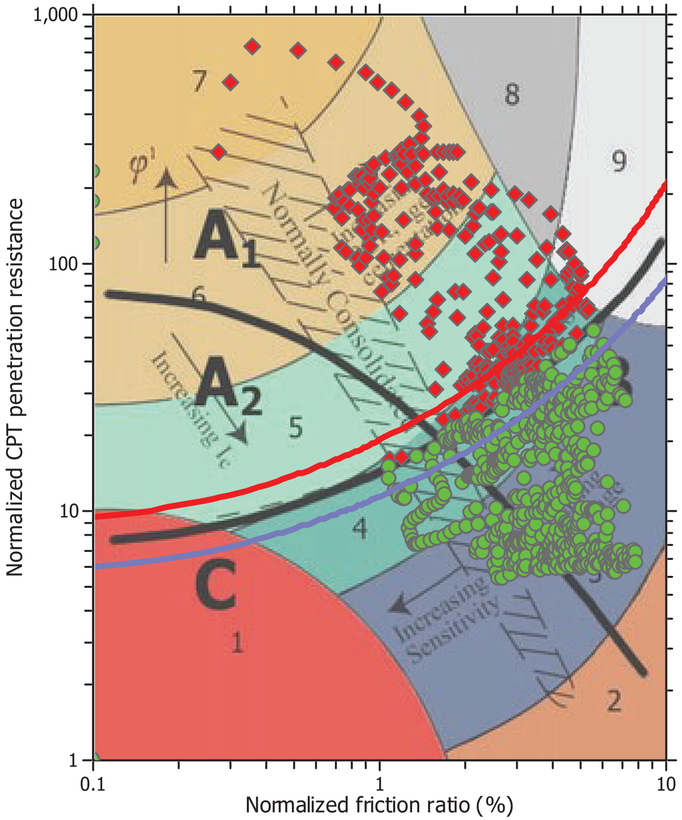
F.S. color scheme

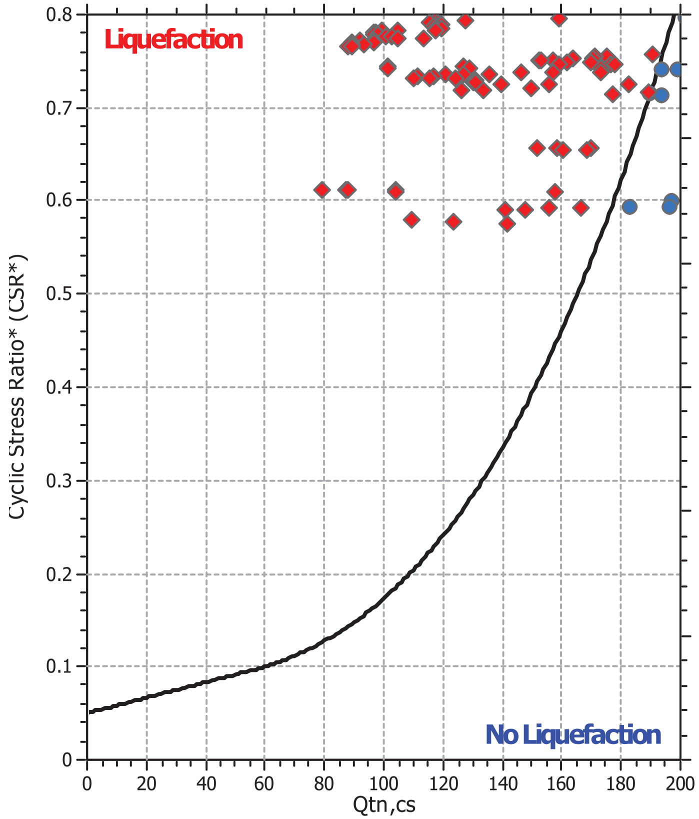
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

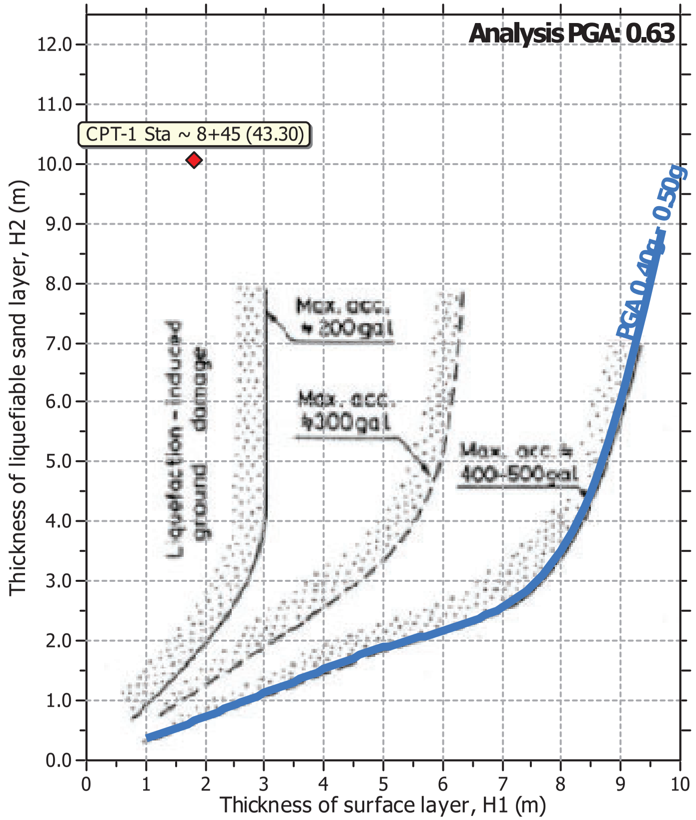
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



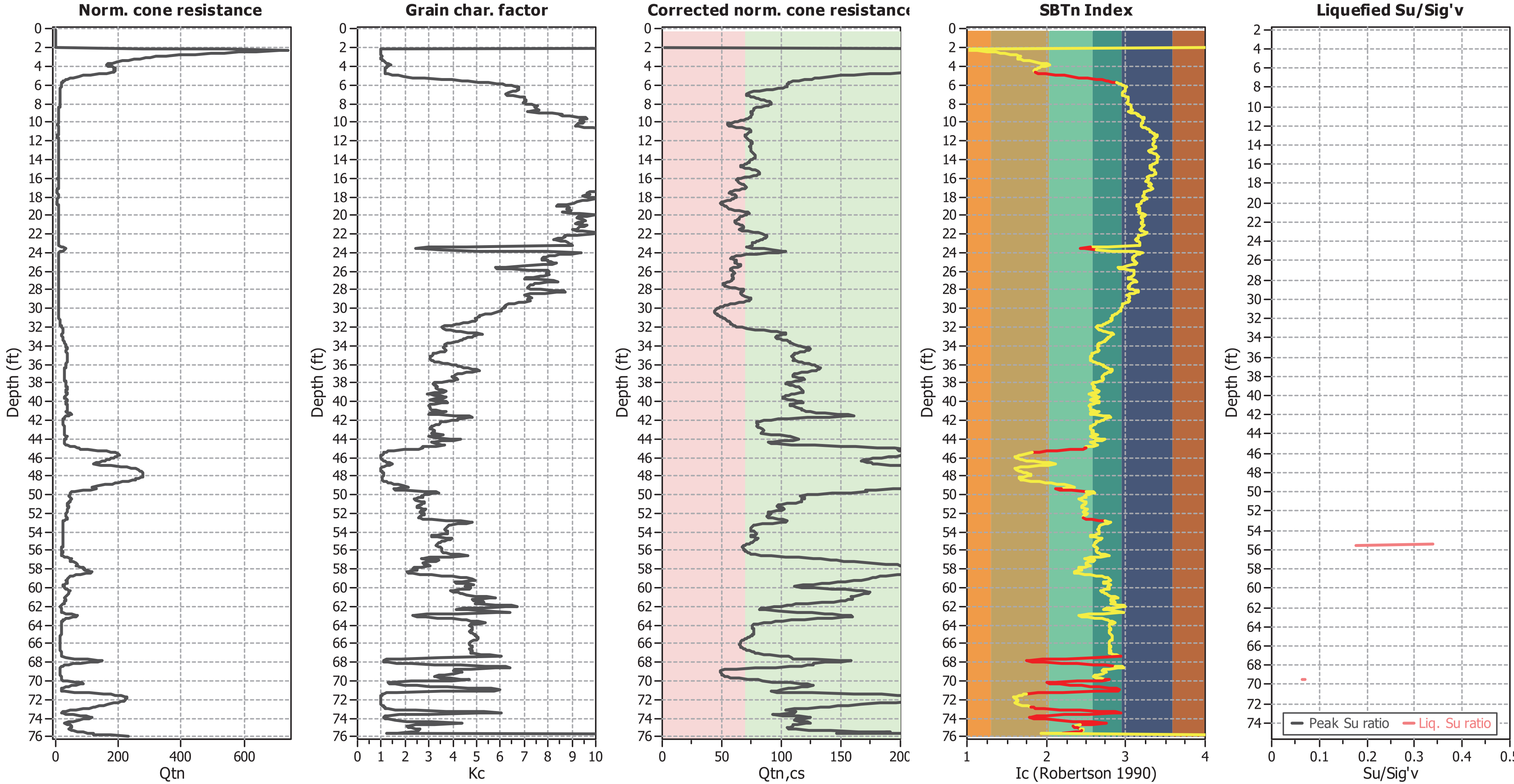




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	1.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.63	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

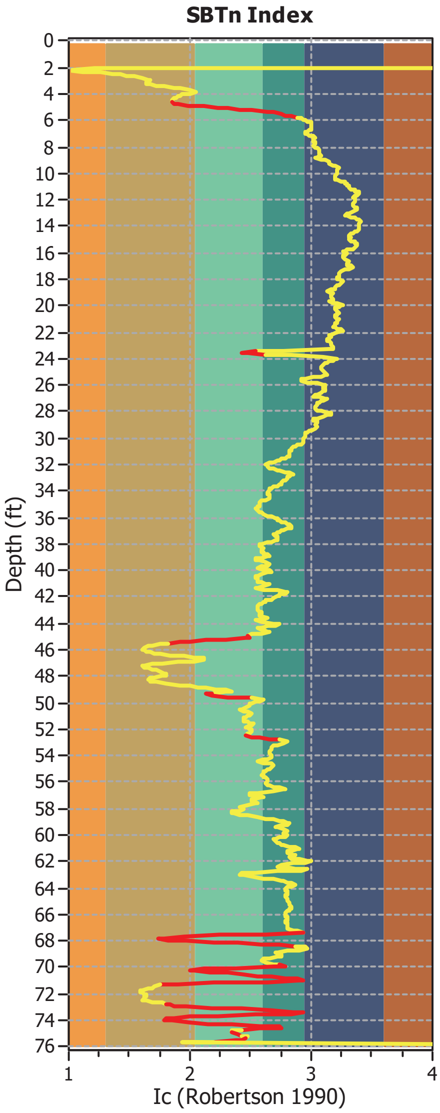
Analysis method:	Robertson (2009)	Depth to water table (erthq.):	1.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.63	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 ft	Fill height:	N/A	Limit depth:	N/A

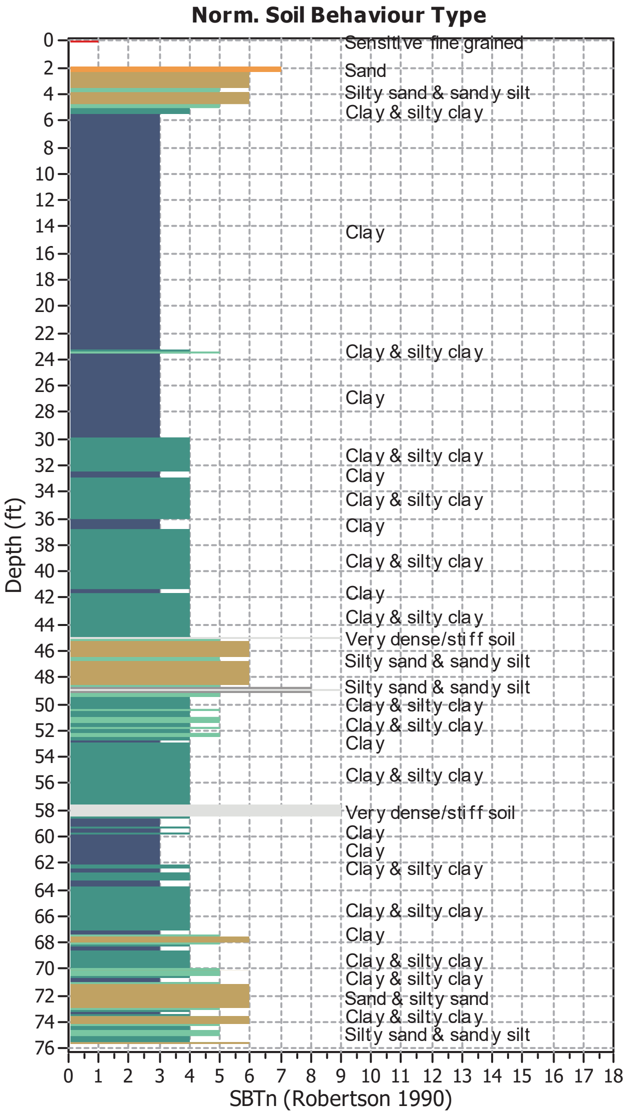
TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between 1.80 < I_c < 3.0) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

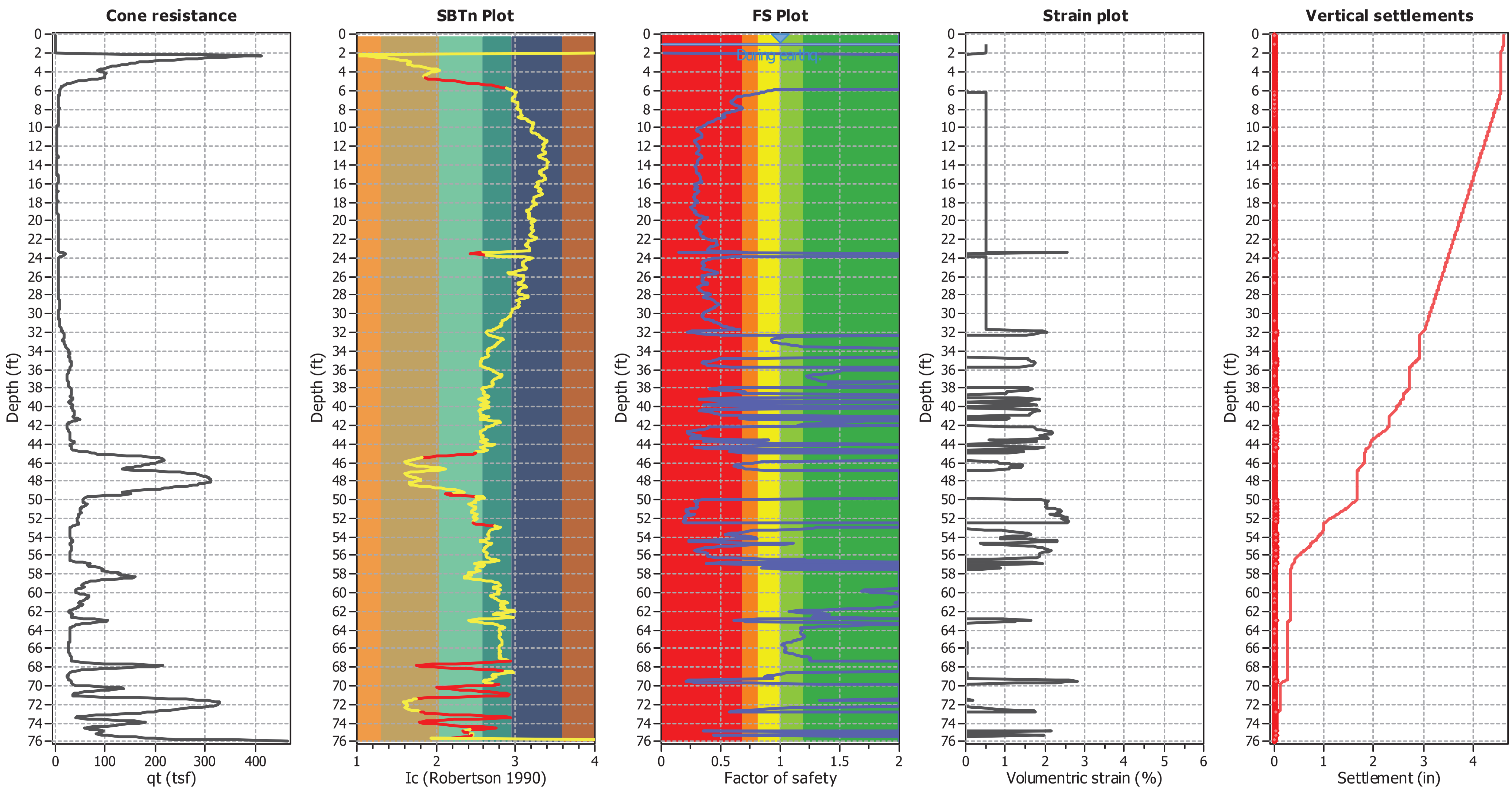
The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.





Transition layer algorithm properties		**General statistics**	
I_c minimum check value:	1.70	Total points in CPT file:	926
I_c maximum check value:	3.00	Total points excluded:	109
I_c change ratio value:	0.0250	Exclusion percentage:	11.77%
Minimum number of points in layer:	4	Number of layers detected:	16

Estimation of post-earthquake settlements

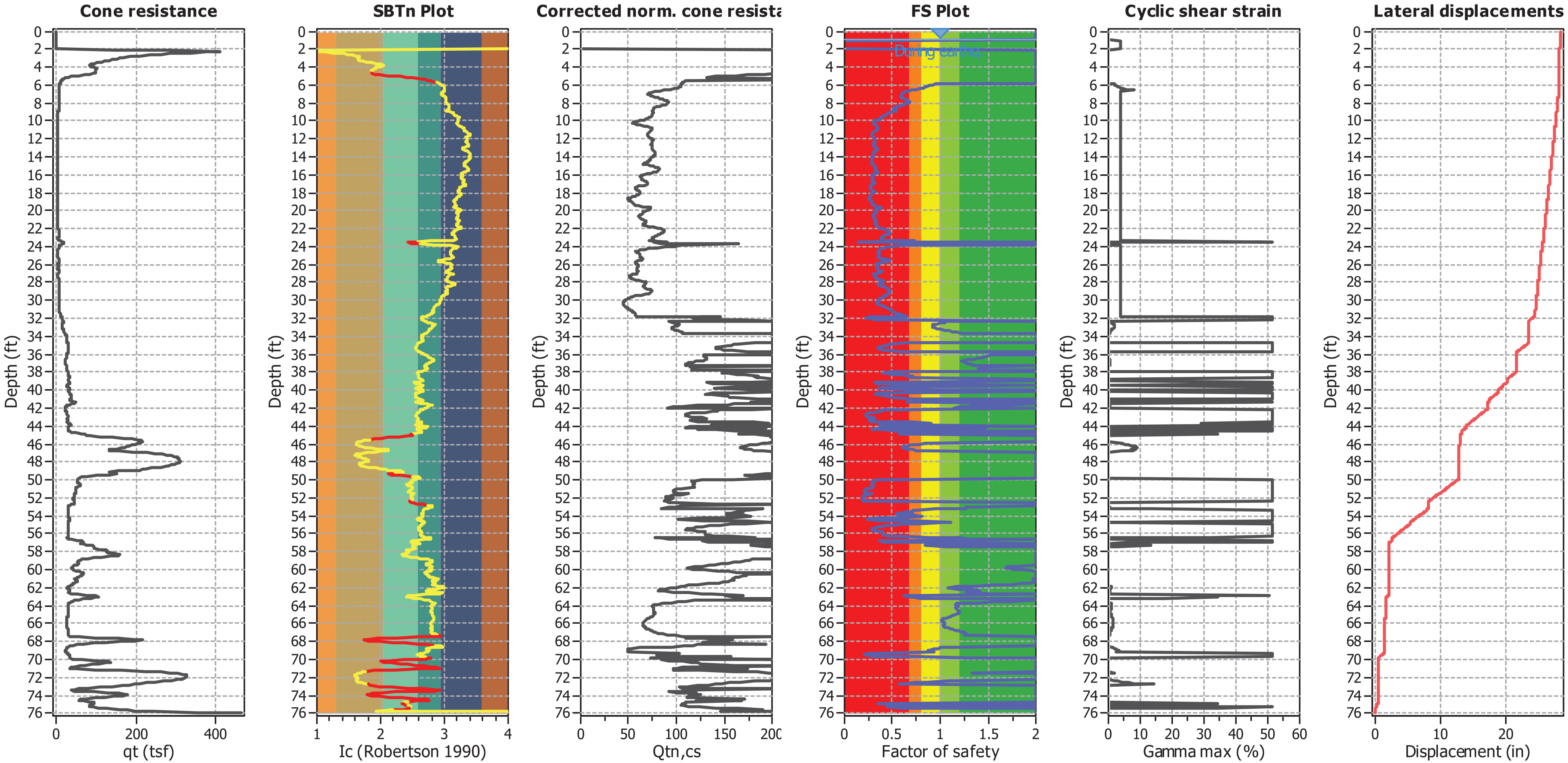


Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

Estimation of post-earthquake lateral Displacements

Geometric parameters: Gently sloping ground without free face (Slope 0.10 %)

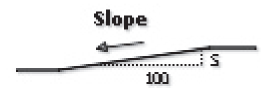


Abbreviations

q_t: Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c: Soil Behaviour Type Index
$Q_{tn,cs}$: Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety
γ_{max}: Maximum cyclic shear strain
LDI: Lateral displacement index

Surface condition



Attachment G

Hydrologic and Hydraulic Analyses
(April 2020)

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Balance Hydrologics

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12020 Donner Pass Road • Unit B1 • Truckee, CA 96160 • (530) 550-9776
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April 14, 2020

Rodney Cahill, P.E.
Mesiti-Miller Engineering, Inc.
224 Walnut Avenue, Suite B
Santa Cruz, California 95060

RE: Preliminary Hydrologic and Hydraulic Analyses for the Proposed Lee Road Trail Design (30%) over Struve Slough, City of Watsonville, California

Dear Mr. Cahill:

This letter report summarizes the findings of hydrologic and hydraulic analyses of Struve Slough to support floodplain management considerations of a pedestrian bridge project across Struve Slough at Lee Road. This report also includes a brief discussion of design considerations and suggestions for potential improvements to the Lee Road culvert over Watsonville Slough.

Background

<u>*Site Description*</u>

The proposed Lee Road Trail crosses both Watsonville Slough and Struve Slough (which is a component of the larger Watsonville Slough system) and is the jurisdictions of both City of Watsonville and Santa Cruz County, depending on the location along the trail alignment. The portion of the trail at the proposed pedestrian bridge over Struve Slough is in the County of Santa Cruz. The Struve Slough watershed has a watershed area of 2.8 square miles[1] at the project site, an elevation range between 88 to 192 feet[2] and a mean annual precipitation of the watershed is 23 inches[2].

Currently, the Lee Road crossing over Struve Slough is a roadway that is seasonally submerged. The proposed bridge design will provide year-round access across the slough for pedestrian and bicycles, while, in the short term, maintaining an access corridor to utility poles and seasonal crossing by emergency vehicles.

---

[1] According to the Santa Cruz County FEMA Flood Insurance Study (FIS), Volume I.
[2] According to U.S. Geological Survey, 2016, The StreamStats program, online at http://streamstats.usgs.gov, accessed on (accessed on April 1, 2020).

Summary of 30% Pedestrian Bridge Design

The proposed bridge design spans the width of Struve Slough and is approximately 940 feet long. The design includes four piers and two abutments, all six of which have an estimated subsurface depth of approximately 125 feet. The four piers and two abutments have a subsurface diameter of 8 feet. Above the Struve Slough bed elevation, the piers have an 8-foot diameter just above the bed surface, but then taper to a diameter of 4 feet at the bridge soffit. There are four 200-foot spans between piers, and one 140-foot segment in the middle of the bridge that spans the mapped FEMA floodway. The proposed bridge design has a soffit elevation of 18.35 feet at each of the abutments (which is one foot above the FEMA base flood elevation[3] (BFE) at this location). The soffit elevation cambers up to an elevation of 20.35 feet in the middle of the center span.

Topographic and Geometric Data

Topographic data and survey information was provided to Balance Hydrologics by MME on March 2, 2020. The vertical datum used is the North American Vertical Datum of 1988 (NAVD88), and the horizontal basis of bearings for the survey is the North American Datum 1983 (NAD83) State Plane, California Zone 3. Generally, the topographic data provided by MME is consistent with publicly available topographic data.

Summary of Currently Effective FEMA Modeling and Mapping

The currently effective FEMA floodplain mapping was published May 16, 2012. The FEMA Flood Insurance Rate Map (FIRM) panel 06087C0393E (**Attachment 2**) establishes the floodplains, special hazard areas, and risk premium zones in the project area.

Base Flood Elevation

This FIRM panel specifies a base flood elevation (BFE) of 17.35 feet in the project vicinity (between cross-sections B and C of the Struve Slough profile). This elevation is based on the assumption that the levees on the nearby Pajaro River fail. In this scenario, the BFE in the Pajaro River sets the water surface elevation in Struve Slough as a result of backwatering. Based on both historical gaging records and previously effective FEMA modeling, it is expected that the water surface elevations in the project vicinity would be substantially lower for a 100-year model run that did not incorporate this assumption and was based solely on the Struve and Watsonville Slough location-specific hydrology and hydraulics.

In 2014, Balance Hydrologics completed work on the Watsonville Slough Hydrology Study, producing data and modeling tools to better understand the hydrology and hydraulics of the Watsonville Sloughs watershed. This study included a multi-year gaging program, which included a gaging station in Struve Slough. As shown in **Attachment 3**, an elevation of approximately 9 feet (NAVD88) represents an average maximum observed water surface elevation for the 10 years that Balance Hydrologics gaged Struve Slough. The maximum water surface elevation that was observed throughout that 10-year record was 10.6 feet. It should be noted that there were no particularly large annual precipitation totals during the

[3] The base flood elevation is defined by FEMA as the computed elevation to which floodwater is anticipated to rise during the base flood. The base flood is defined as the 100-year flood, or the “one-percent annual chance flood.”

10-year dataset (e.g. "El Niño"), although four of ten years in the selected period have annual totals greater than the long-term mean. The peak seen in October 2009 is due to a single atmospheric river storm system.

Additionally, an archived 1980 HEC-2 modeling summary was obtained through a FEMA Engineering Library request. While this data is no longer effective and should not be used for design purposes, this documentation reports that the 100-year water surface elevation in the vicinity of the project is approximately 10 feet (once converted to NAVD88[4]). While this result does not consider the changes to the Slough system geometry over the past 40 years (including a significant amount of sediment deposition and backwatering), this information is helpful to illustrate that the currently effective FEMA BFE values are many feet higher than what would be expected if their model run parametrized for the 100-year hydraulic behavior of Struve Slough based on local hydrologic behavior as opposed to backwatering from Pajaro River levee failure.

Floodway and Floodplain Extents

At the location of the proposed pedestrian bridge, the FEMA floodway is approximately 120 feet wide, and the bridge is designed to fully span the floodway (**Attachment 2**). While no design elements are located within the floodway, there are four piers and one abutment (left bank) located within the FEMA-defined floodplain extents. However, upon closer inspection, the extents of the floodplain are not aligned with the BFE according to the ground elevations provided in the project topographic information. Comparison of the BFE, the project topographic information, and the location of the proposed pier and abutments indicates that the left bank abutment[5] is outside of the floodplain extents (by a length of over 20 feet), while the right bank abutment is adjacent to the floodplain extents (even though the FIRM shows that it is outside). The locations of these design elements are appropriately located in the hydraulic calculations that were performed (outlined below).

The total fill in the floodplain fringe was calculated in order to assess compliance with the Santa Cruz County ordinance requiring that no more than 50 cubic yards of fill are incorporated into the floodplain[6] (although it is important to note the associated amendment[7]). As proposed, the bridge has four identical piers in the floodplain, each with an 8-foot diameter at the channel bottom, with a tapered shape that reduces to a diameter of 4 feet at the bridge soffit. Each pier is approximately 12 feet in height above the channel bottom, extending from an average slough bed elevation of 5.5 feet to the BFE elevation of 17.35 ft. Combined, all four piers in the floodplain account for approximately 52 cubic yards of fill.

In addition, the abutment on the right bank is positioned to be just within the floodplain boundary (as described above). Though clearly outside the hazard extents published in the FIRM panel (**Attachment 2**), comparison of the project topographic data and the project design indicate that the abutment is

[4] According to VERTCON at this location, NGVD29 is approximately 2.7 feet lower than NAVD88.
[5] Looking downstream.
[6] Chapter 16.10. Placement of Fill: "Allow the placement of fill within the 100-year floodplain in the minimum amount necessary, not to exceed 50 cubic yards."
[7] R322.2.7 "…an application to place more than 50 cubic yards of fill in the flood fringe may be considered if: (i) a civil engineered grading plan is provided, (ii) an equal volume of material (soil) is taken out of the flood fringe on the same or immediately adjacent property, (iii) only the minimum amount of fill necessary is placed…"

designed to be placed adjacent to the 17-foot elevation contour. Because the BFE at this location is at an elevation of 17.35 feet, the fill in the floodplain for this abutment would be minimal (4 cubic yards or less).

The amount of fill in the floodplain fringe as a result of the design (calculated above) will be offset by the amount of cut anticipated during construction. Potential areas of cut include the existing roadway that is above the normal water surface of Struve Slough between the designed abutments, and a depth of 2 inches of the roadway surface material along the alignment of the designed bridge for the portion of the road that is regularly inundated.

Hydraulic and Hydrologic Analyses

Hydraulic and hydrologic analyses were compiled to estimate water surface elevations in order to understand the impact that the proposed bridge replacement would have on flooding potential in the project reach. The US Army Corp of Engineers Hydrologic Engineering Center's River Analysis System (HEC-RAS) version 5.0.7 was used to analyze hydraulic behavior of Struve Slough in the vicinity of the bridge replacement project.

Two geometries were developed for hydraulic modeling; one representing existing conditions (using the MME provided topographic data) and the other representing proposed conditions with the bridge construction (using the MME provided 30% pedestrian bridge design).

Water surface profiles were calculated using a uniform flow computation assuming one-dimensional, steady flow conditions. Manning's *n* values were used to represent roughness at the cross-sections as 0.025 for the active channel and 0.035 for the overbank areas. These coefficients were obtained from the previously discussed HEC-2 model information (date April 1980) provided by FEMA through a data request from the Engineering Library. These roughness values fall within the range presented in the FEMA Flood Insurance Study (FIS) Volume I[8] for Struve Slough (Volume I, Table 14, page 45).

The average slope of the reach that was used in the uniform flow computations (0.0005 feet/feet) was estimated through observation of the project topographic data in the reach of the channel near the project site. From the same topographic data, nearly 50 station and elevation pairs were extracted to construct the channel geometry of a cross-section at the proposed bridge alignment.

Uniform flow calculations were computed using the slope and channel geometries described above and the 100-year discharge value, which is reported in the Summary of Discharges table in the FIS (Table 10, page 48) as 700 cfs[9]. This discharge value was input into the model to calculate the water surface elevations for the existing and proposed conditions *without* the Pajaro River levee failure assumption.

[8] Effective September 29, 2017.
[9] This 100-year discharge value is associated with the location of the confluence of Struve Slough and Watsonville Slough.

Results and Conclusions

The results from the above described analysis of Struve Slough water surface elevations are summarized in **Table 1** and enclosed in **Attachment 4**.

Table 1. Water Surface Elevation (WSE) Model Results

100-year Discharge *(cfs)*	700
Slope *(ft/ft)*	0.0005
Existing Conditions WSE *(ft)*	5.92
Proposed Conditions WSE *(ft)*	5.94
WSE Increase *(ft)*	0.02

The uniform flow computation results show that the existing condition 100-year water surface has an elevation of 5.92 feet, and the proposed bridge design (with the channel geometry that includes all four piers and two abutments) has a 100-year water surface elevation of 5.94 feet. In other words, the results indicate that the proposed bridge design causes a 0.02-foot increase in the water surface elevation of Struve Slough at the project location. While this increase is negligible, the calculated proposed water surface elevation remains more than 10 feet below the designed soffit of the bridge, suggesting ample clearance for the channel geometry to contain the FIS-reported 100-year discharge event at this location.

Additionally, if the Struve Slough tailwater was higher under the circumstances and assumptions of Pajaro River levee failures (as illustrated in the effective FEMA floodplain mapping, described above), this would cause lower velocities in the slough for the given 100-year discharge at this location. It is expected that a higher tailwater elevation and lower channel velocities would cause even less of an increase in water surface elevation for the 100-year event.

It should be noted that the proposed bridge design is currently at the 30% design phase as of the date of this analysis, and further analyses may be needed confirm that future iterations of the design will meet regulatory criteria upon changes to the bridge alignment, soffit elevation, and/or pier dimensions.

Potential Culvert Improvement at Watsonville Slough

As part of the larger Lee Road Trail project, improvements to the Lee Road culvert are proposed in order to widen this roadway crossing to allow for the addition of bicycle and walking lanes over Watsonville Slough. The following section discusses the FEMA background and suggested design approach for considering the hydraulic and floodplain management considerations associated with these proposed improvements.

FEMA Background

The Lee Road culvert (**Attachment 5**) is located on the FIRM panel 06087C0394E and lies between cross-sections T and U of the FEMA floodplain mapping and profiles for the Watsonville Slough channel (**Attachments 6** and **7**). The floodway for Watsonville Slough at the Lee Road crossing is approximately 45 feet in width. According to the FEMA profiles (and the FEMA-assumed geometry), the 10-year discharge (10% annual chance flood) is conveyed through the Lee Road culvert, but the other storm profiles shown (2%, 1% and 0.2% annual chance floods) over-top the culvert and roadway. The 1% annual chance profile shows a water surface elevation of 18.5 feet at the Lee Road culvert, while the crown of the roadway is shown to be at an elevation of approximately 15 feet. It should be noted that these water surface elevations are not a result of the culvert being undersized, but because of the aforementioned Pajaro River levee failure assumption, among other hydraulic parameters/assumptions.

Design Approach

We recommend the following design elements be considered during the Lee Road culvert design process:

- The invert of the culvert should remain generally consistent with the existing condition in order to avoid the risk of negatively impacting upstream and downstream conveyance and hydraulics. **Attachment 7** shows that this culvert has an invert elevation of approximately 5.5 feet.
- The roadbed elevation for the improved culvert should not be raised from the existing roadbed elevation to ensure that a no-rise condition is met, and so that a transverse flow impediment would not be created.
- Keeping the invert and roadbed elevations the same, the culvert length could be increased (in the direction perpendicular to flow) with a box culvert or other more hydraulically efficient design option than the existing condition. **Attachment 7** shows that FEMA reports the Lee Road culvert to have a diameter of approximately 60 inches. It is likely that the culvert does not have this full design capacity due to sediment buildup, disrepair, and/or a discrepancy in the FEMA-reported geometry and the designed geometry.
- Conveyance capacity in the ditch downstream of the culvert shall need to be considered.
- As actual capacity of the culvert depends on sediment deposition and buildup, ongoing maintenance may be required after the project is completed.

Next Steps

As the design of the Lee Road culvert improvements progresses, detailed hydrologic and hydraulic studies will be conducted, which will depend on the design of the enhanced culvert crossing. The FEMA effective model will be utilized to calculate the water surface elevations for the existing and proposed conditions of the culvert. We believe that the suggestions outlined above will allow for the culvert improvements to achieve a “no-rise condition,” meaning that the 100-year water surface elevations in the project vicinity do not increase as a result of the proposed project.

To the extent that the culvert length increases, the improvements could be considered fill to Waters of the United States and may require mitigation. If this is the case, it may be possible that improvements to the culvert (as part of the replacement) could preserve and enhance values of this location of Watsonville Slough, allowing the facility to be self-mitigating.

Closing

The analysis and model results described in this letter are intended to support the design of the Lee Road Trail project. The proposed condition calculations assume the trail design described in the 30% design plans, dated May 2019 and designed by MME. Any other design should be re-analyzed to confirm the reported results. Additionally, this report and associated analyses do not consider Santa Cruz County, City of Watsonville, and/or Caltrans design standards, guidelines and permitting regulations for bridge and trail infrastructure. These references should be consulted for both the pedestrian bridge and culvert for freeboard, capacity, and design and permitting-related considerations. If you have any further questions about the study or the results presented herein, please do not hesitate to contact us.

Sincerely,

BALANCE HYDROLOGICS, Inc.

Paxton Ridgway
Hydrologist

Montana Marshall

Montana Marshall, P.E., CFM
Civil Engineer/Hydrologist

Edward Ballman, P.E., CFM
Principal Engineer

Enclosures:
Attachment 1. Lee Road Trail – Workmap
Attachment 2. Struve Slough FIRM Panel (*06087C0393E*)
Attachment 3. Struve Slough Gage Data
Attachment 4. Struve Slough HEC-RAS Results
Attachment 5. Lee Road culvert, existing condition
Attachment 6. Watsonville Slough FIRM Panel (*06087C0394E*)
Attachment 7. Watsonville Slough FIS Profile

ATTACHMENT 1.
LEE ROAD TRAIL – WORKMAP

Balance Hydrologics, Inc.
800 Bancroft Way · Suite 101
Berkeley, CA 94710
tel (510) 704-1000 · fax (510) 704-1001
www.balancehydro.com

SUBMITTALS / REVISIONS

BY

DATE

DESIGNED BY | DRAWN BY | CHECKED BY | IN CHARGE | DATE

NOT FOR CONSTRUCTION

WORKMAP

STRUVE SLOUGH TRAIL BRIDGE PROJECT
CITY OF WATSONVILLE, CALIFORNIA

PROJECT NUMBER
218223
SCALE
AS NOTED
ATTACHMENT
1

ATTACHMENT 2.
STRUVE SLOUGH FIRM PANEL

National Flood Hazard Layer FIRMette

FEMA

36°54'32.11"N

121°47'28.45"W

121°46'51.00"W

36°54'3.34"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

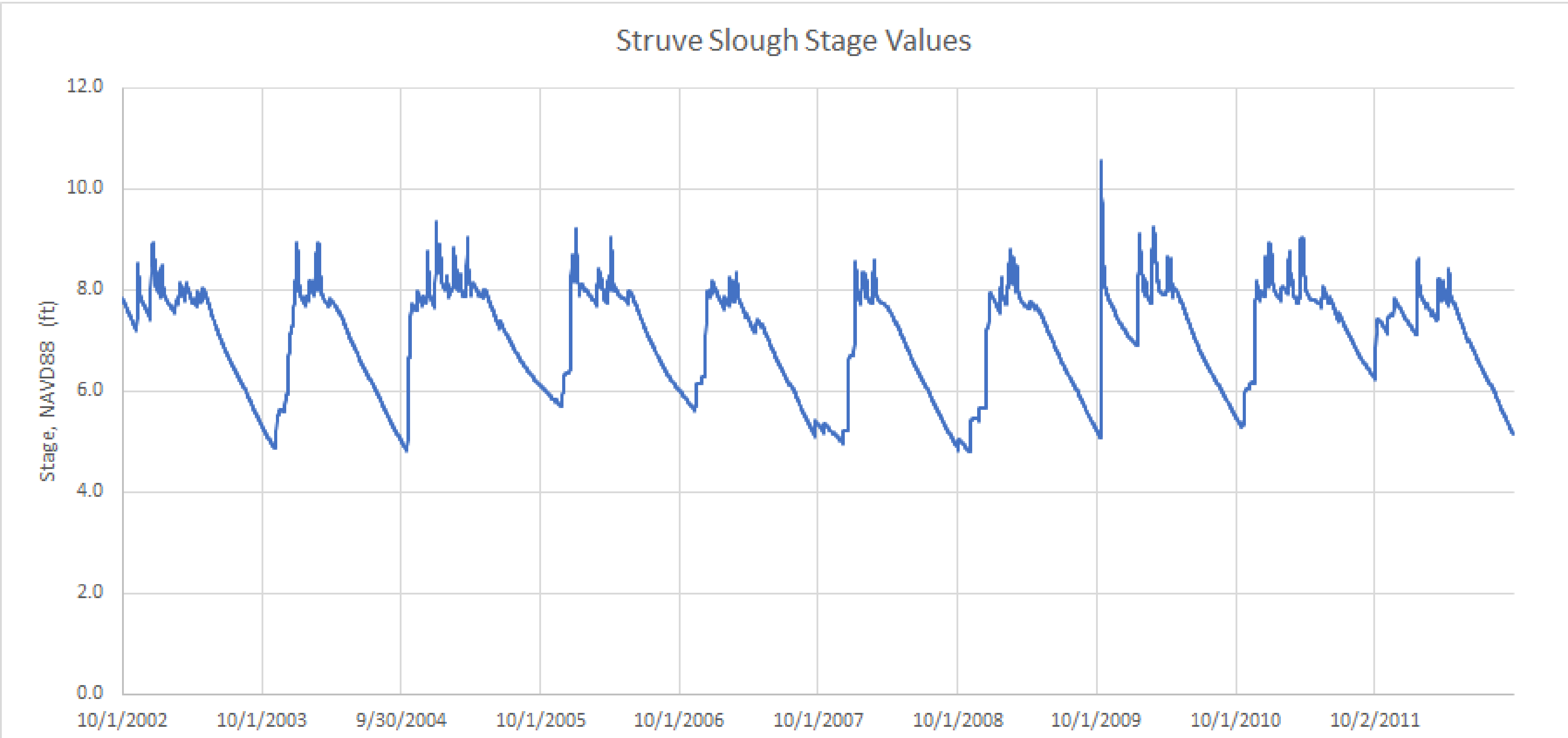
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/4/2018 at 1:19:30 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

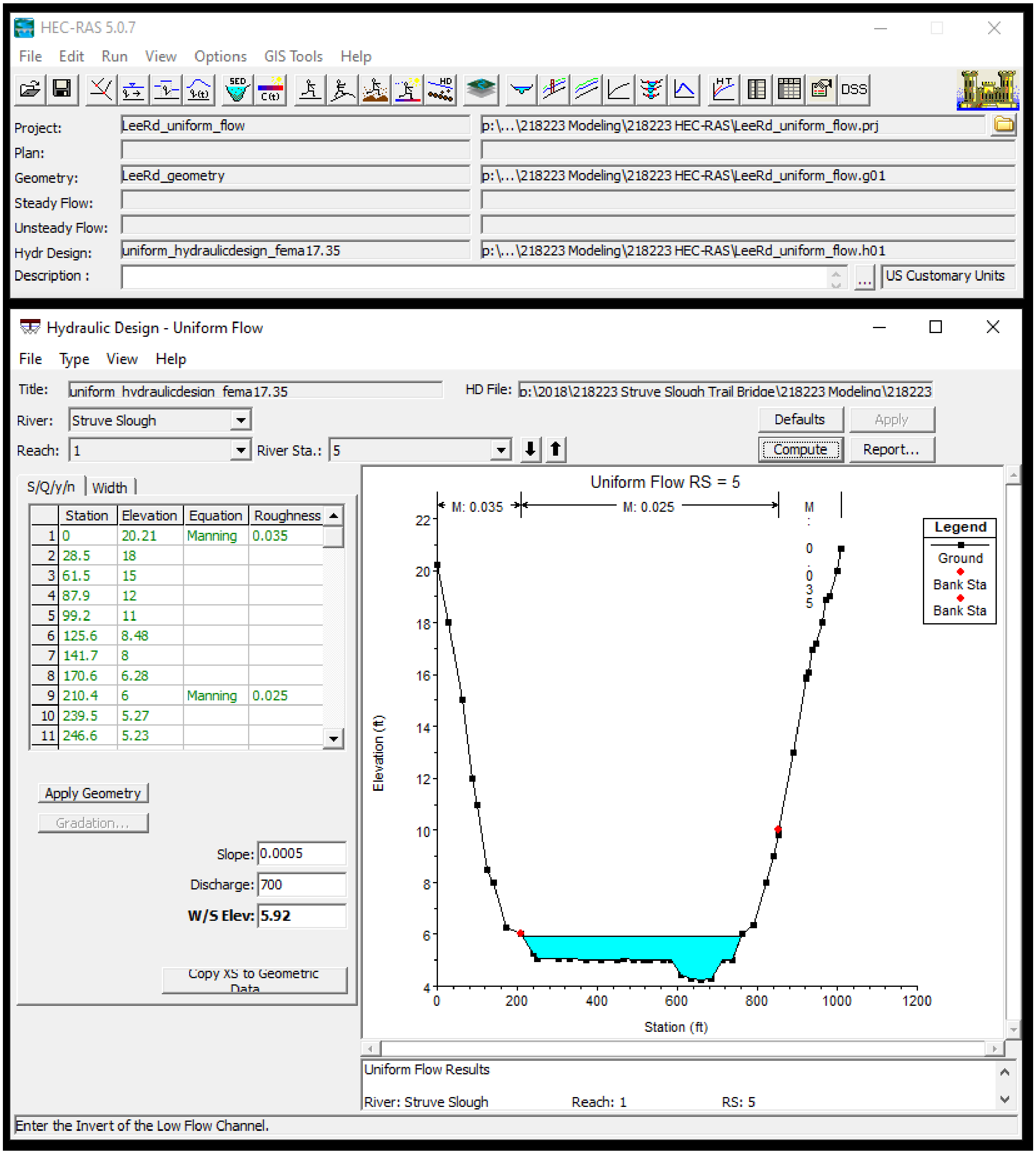
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ATTACHMENT 3.
STRUVE SLOUGH GAGE DATA

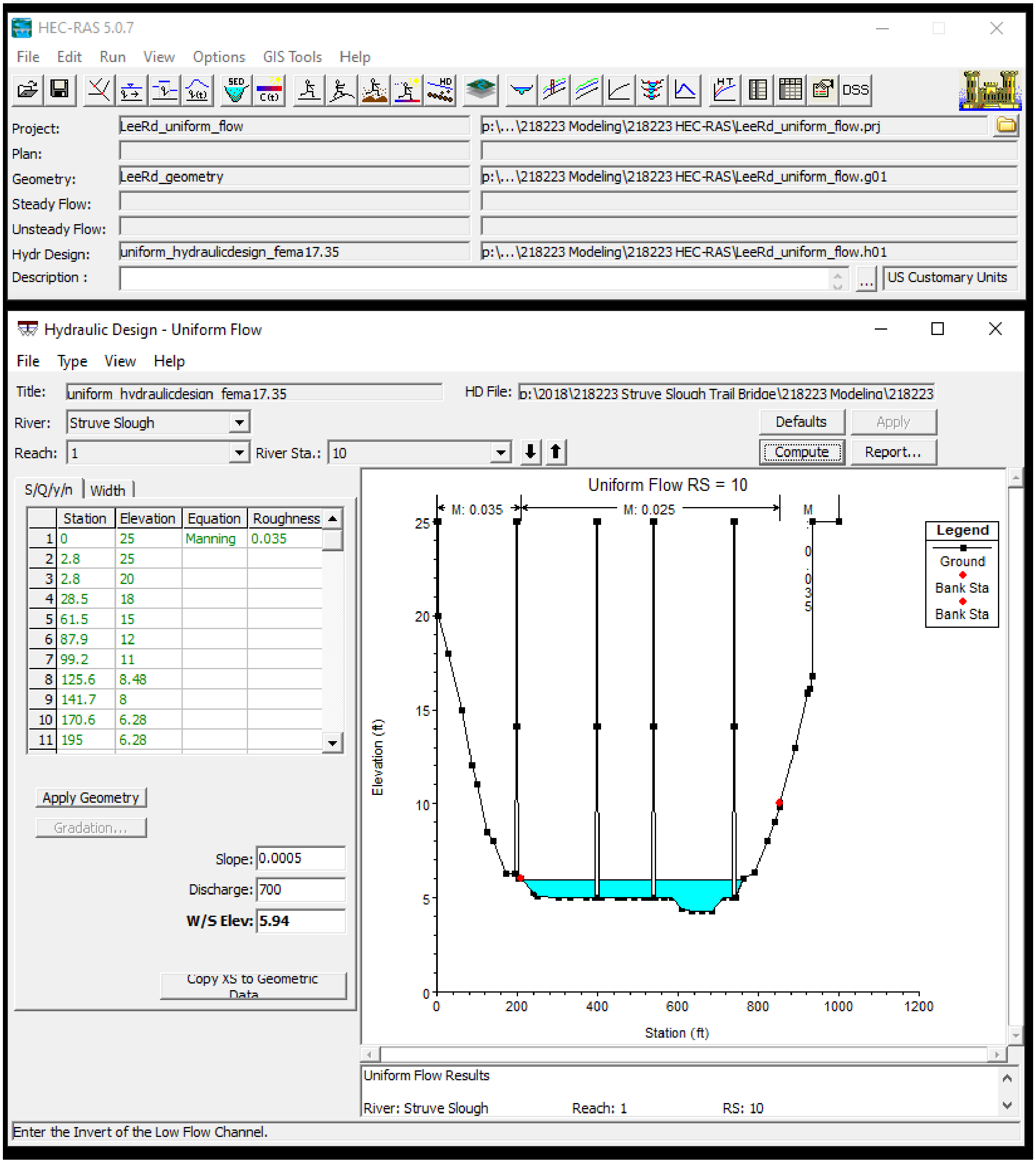

Struve Slough Stage Values
Stage, NAVD88 (ft)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
10/1/2002
10/1/2003
9/30/2004
10/1/2005
10/1/2006
10/1/2007
10/1/2008
10/1/2009
10/1/2010
10/2/2011

ATTACHMENT 4.
STRUVE SLOUGH HEC-RAS RESULTS

Existing Conditions



Proposed Conditions



ATTACHMENT 5.
LEE ROAD CULVERT, EXISTING CONDITION

Looking downstream

Looking upstream

ATTACHMENT 6.
WATSONVILLE SLOUGH FIRM PANEL

National Flood Hazard Layer FIRMette

FEMA

36°54'20.02"N

121°47'9.79"W

121°46'32.34"W

36°53'51.25"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

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- Without Base Flood Elevation (BFE) *Zone A, V, A99*
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- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
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- Area of Undetermined Flood Hazard *Zone D*

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- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

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- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
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- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

N

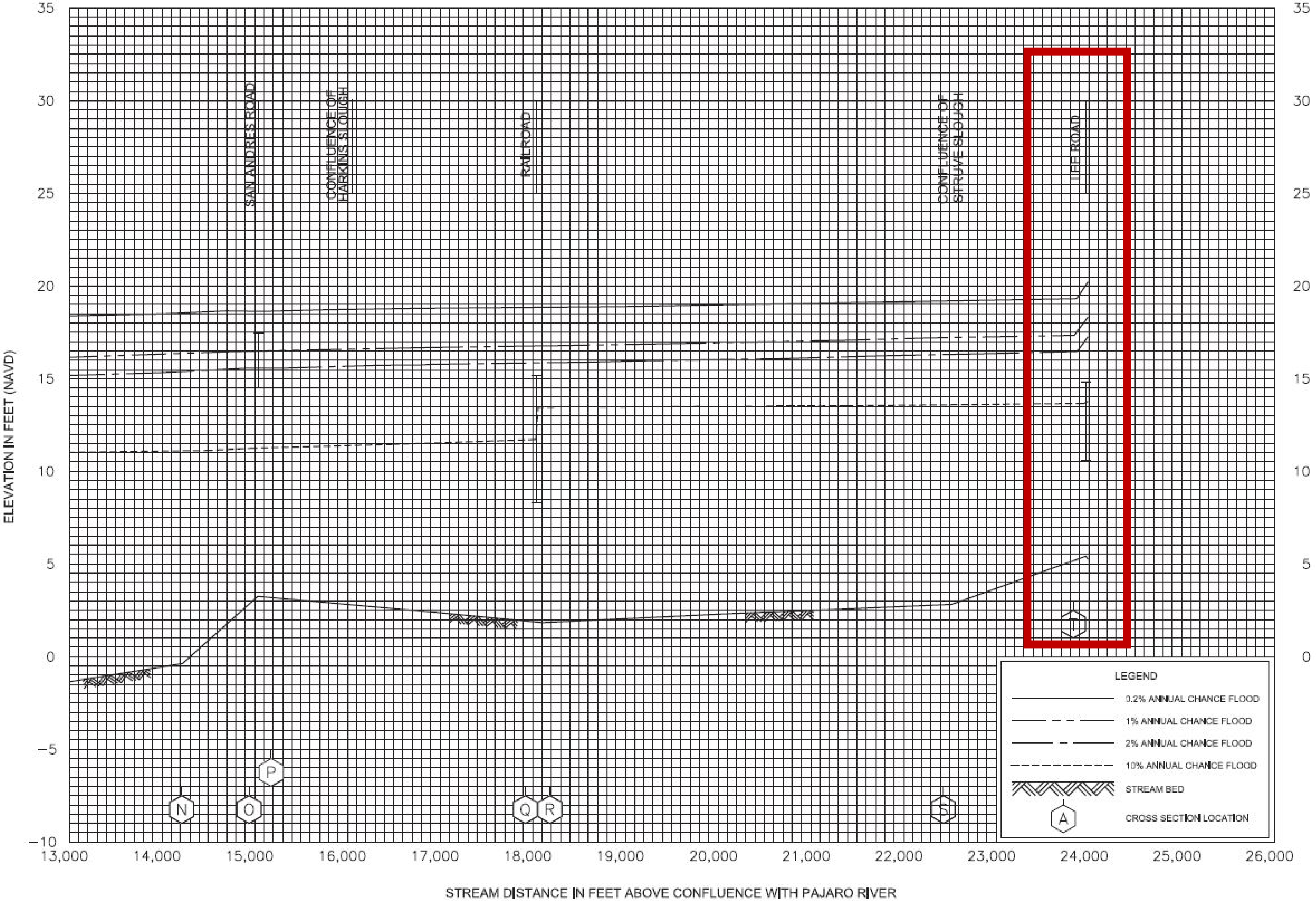
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/21/2019 at 8:15:05 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ATTACHMENT 7.
WATSONVILLE SLOUGH FIS PROFILE



FLOOD PROFILES

WATSONVILLE SLOUGH

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA CRUZ COUNTY, CA
AND INCORPORATED AREAS

77P

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Attachment H

Culvert Hydraulic Analysis
(December 2020)

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Balance Hydrologics

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224 Walnut Avenue • Suite E • Santa Cruz, CA 95060 • (831) 457-9900
12020 Donner Pass Road • Unit B1 • Truckee, CA 96160 • (530) 550-9776
www.balancehydro.com • email: office@balancehydro.com

December 4, 2020

Rodney Cahill, P.E.
Mesiti-Miller Engineering, Inc.
224 Walnut Avenue, Suite B
Santa Cruz, California 95060

RE: Preliminary Hydraulic Modeling Analysis for the Watsonville Slough Crossing, Lee Road Trail (65% Design), City of Watsonville

Dear Mr. Cahill:

This memo summarizes the preliminary findings of the hydraulic analyses of Watsonville Slough to support floodplain management considerations for improvements to the existing culvert at Lee Road. The work described herein is planned in conjunction with the overall Lee Road Trail Project (currently at the 65% design phase), including the proposed Lee Road pedestrian bridge over Struve Slough[1].

Background

<u>Site Description</u>

As part of the larger Lee Road Trail project, improvements to the Lee Road culvert are proposed in order to widen this roadway crossing to allow for the addition of bicycle and pedestrian lanes over Watsonville Slough (see **Attachment 2**). Although close to the boundary line between the City of Watsonville and the County of Santa Cruz, the culvert crossing (including the roadway) is within the City jurisdiction at this location. The Watsonville Slough watershed has an area of approximately 2 square miles (at the project site), an elevation range between 88 to 192 feet[2], and the mean annual precipitation of the watershed is approximately 23 inches[2].

<u>FEMA Background</u>

The currently effective FEMA floodplain mapping in the project vicinity was published May 16, 2012. The FEMA Flood Insurance Rate Map (FIRM) panel 06087C0393E (**Attachment 3**) establishes the floodplains, special hazard areas, and risk premium zones in the project area.

The Lee Road culvert is located in a Zone AE Special Flood Hazard Area (typically known as the "100-year floodplain") where base flood elevations ("BFEs") have been identified through detailed studies.

[1] Refer to "Preliminary Hydrologic and Hydraulic Analyses for the Proposed Lee Road Trail Design (30%) over Struve Slough, City of Watsonville, California" Letter Report submitted to MME in April of 2020.
[2] According to U.S. Geological Survey, 2016, The StreamStats program, online at http://streamstats.usgs.gov, accessed on (accessed on October 15, 2020).

Lee Road lies between cross-sections T and U of the FEMA floodplain mapping and profiles for the Watsonville Slough channel (**Attachments 3** and **4**). Additionally, the existing and proposed crossings are within a mapped jurisdictional floodway for Watsonville Slough that is approximately 45 feet in width. According to the FEMA profiles (and the FEMA-assumed geometry), the 10-year discharge (10% annual chance flood) is conveyed through the Lee Road culvert, but the other storm profiles shown (2%, 1% and 0.2% annual chance floods) over-top the culvert and roadway. The 1% annual chance profile shows a water surface elevation of 18.5 feet at the Lee Road culvert, while the crown of the roadway is shown to be at an elevation of approximately 15 feet. It should be noted that these water surface elevations are not a direct result of the culvert being undersized, but because of the Pajaro River levee failure assumption (described below).

Base Flood Elevation

This FIRM panel specifies a base flood elevation (BFE) of 18.5 feet in the project vicinity (between cross-sections T and U of the Watsonville Slough profile). This elevation is based on the assumption that the levees on the nearby Pajaro River breach. In this scenario, the BFE in the Pajaro River sets the water surface elevation in Watsonville Slough as a result of overbank release. Based on both historical gaging records and previously effective FEMA modeling, it is expected that the water surface elevations in the project vicinity would be substantially lower for a 100-year model run that did not incorporate this assumption and was based solely on the Watsonville Slough location-specific hydrology and hydraulics.

Additionally, an archived 1980 HEC-2 modeling summary was obtained through a FEMA Engineering Library request. While this data is no longer effective and should not be used for design purposes, this documentation reports that the 100-year water surface elevation in the vicinity of the project is approximately 15.5 feet (once converted to NAVD 88[3]). While this result does not consider the changes to the Slough system geometry over the past 40 years (including a significant amount of sediment deposition and backwatering), this information is helpful to illustrate that the currently effective FEMA BFE values are multiple feet higher than what would be expected if their model was run parametrized for the 100-year hydraulic behavior of Watsonville Slough based on local hydrologic behavior as opposed to backwatering from Pajaro River levee failure.

Floodplain

Because the proposed design is a replacement of an existing culvert, the total fill in the floodplain fringe is anticipated to be less than 50 cubic yards, and therefore in compliance with the Santa Cruz County ordinance requiring that no more than 50 cubic yards of fill are incorporated into the floodplain[4] (although it is important to note the associated amendment[5]).

[3] The conversion between datums for this project site is NGVD 29 elevation + 2.7 feet = NAVD 88 elevation.
[4] Chapter 16.10. Placement of Fill: “Allow the placement of fill within the 100-year floodplain in the minimum amount necessary, not to exceed 50 cubic yards.”
[5] R322.2.7 “…an application to place more than 50 cubic yards of fill in the flood fringe may be considered if: (i) a civil engineered grading plan is provided, (ii) an equal volume of material (soil) is taken out of the flood fringe on the same or immediately adjacent property, (iii) only the minimum amount of fill necessary is placed…”

Hydraulic Modeling

A hydraulic model was developed to estimate water surface elevations in order to understand the impact that the proposed culvert improvements would have on flooding potential in the project reach. The U.S. Army Corps of Engineers Hydrologic Engineering Center's River Analysis System (HEC-RAS) version 5.0.7 was used to analyze the hydraulic behavior of Watsonville Slough in the vicinity of the project. **Attachment 5** shows the cross-sections used for the purposes of this project.

Two geometries were developed for hydraulic modeling: one represented the existing conditions of the slough and culvert, while the second modeled the proposed conditions that are expected with the replacement of the old culvert.

Topographic Data

Topographic data and survey information were provided to Balance Hydrologics by MME on March 2, 2020; the survey data was completed in the North American Vertical Datum of 1988 (NAVD88), and the North American Datum 1983 (NAD83) State Plane California Zone 3 horizontal basis of bearings. Generally, the publicly available topographic data is consistent with the topographic data provided by MME. Additional channel elevation data was collected by MME on October 2, 2020.

Two other sources of topographic data were relied upon in the project. The first was the Watsonville Slough Hydrology Study, completed by Balance Hydrologics in 2014, that produced data and modeling tools to better understand the hydrology and hydraulics of the Watsonville Slough watershed. In support of this study, Environmental Data Solutions completed detailed survey work in the spring of 2012. This work included the survey of 30 channel cross-sections and a longitudinal profile of the main Watsonville Slough channel from Highway 1 down to Beach Road.

The second source of topographic data was NOAA Lidar data, acquired in 2010, and made available through the U.S. Geological Survey and the American Recovery and Reinvestment Act of 2009[6].

Modeled Conditions

The existing conditions model was built using the multiple topographic data sources outlined in the section above. Relying on multiple data sources allowed the cross sections used in the hydraulic model to best reflect the floodplain topography and the degree of sedimentation currently present in the slough channel. Model inputs (such as channel cross-section locations and roughness coefficients) were kept consistent between the two models (as appropriate) in order to properly understand the impact that the proposed culvert design has on the reach water surface elevations.

[6] OCM Partners, 2020: 2010 ARRA Lidar: California Coastal Project (Zone 3), https://www.fisheries.noaa.gov/inport/item/49647.

Existing Culvert

The existing culvert, surveyed by MME, was found to have the following characteristics[7] (see **Attachment 1**):

- Two 60-inch diameter CMP barrels
- Invert elevations at approximately 6 feet
- Slough channel elevations at approximately 8 feet, indicating that the culverts are partially filled with sediment
- A roadbed elevation of approximately 15 feet

Proposed Culvert (65% design)

The modeled culvert inputs were revised from the inputs associated with the existing condition to reflect MME's 65% culvert design (dated October 28, 2020).The proposed culvert (see **Attachment 2**) is a precast concrete box culvert with an invert of 5 feet, a rise of 5 feet, a span of 10 feet, and a total length in the streamwise direction of 55 feet. The MME design calls for the elevation of the roadbed to be maintained at approximately 15 feet. Because the ditch bed just upstream and downstream of the proposed culvert replacement is at an elevation of approximately 7.8 feet, natural fill material will be placed in the culvert bottom above the invert to match the existing grades upstream and downstream. This will allow for the culvert to have a natural bed (instead of concrete) and will also allow for natural fluctuations in the ditch bed elevations over time.

Channel Slope and Roughness

The slope of the reach, set at 0.001 ft/ft, was estimated through observation of the topographic data for the channel near the project site. To represent roughness, Manning's *n* values were input at each cross-section; a value of 0.045 was used for the main channel, while the overbank values ranged from 0.03 to 0.06 based on variation in land use and vegetative cover. The coefficients were determined based on visual observation, the effective FEMA Flood Insurance Study (FIS) (Volume I, Table 14, page 45), and the previously discussed HEC-2 model information provided by FEMA through a data request from the Engineering Library.

Flow Values

The 100-year discharge value, used to assess the no-rise condition, was taken from the Summary of Discharges table provided in the FIS (Table 10, page 48), and is 426 cubic feet per second at the location of Watsonville Slough at Ford Street, roughly three quarters of a mile upstream of the project area. Using this value allowed for water surface elevations to be calculated for the existing and proposed conditions *without* the Pajaro River levee failure assumption.

[7] It should be noted that the information from the survey data is not entirely consistent with the information outlined in the FEMA FIS, which shows one 54-inch diameter culvert with an invert elevation of 10.6 feet and a ground elevation of 5.5 feet.

Results and Conclusions

The preliminary modeling results for the pre- and post-project conditions show that the proposed culvert design would cause no-rise in the 100-year water surface elevation of Watsonville Slough at the project location. The tabulated existing and proposed condition water surface elevation results are summarized in ***Table*** 1, and further information is presented in **Attachment 5**. A positive value indicates that the modeled base flood elevation is lower in the post-project case.

Table 1. Preliminary Modeling Results for the 100-year Storm Event

Cross Section Station	Existing 100-yr WSE	Proposed 100-yr WSE	Change in WSE
ft	*ft*	*ft*	*ft*
1863	15.8	15.8	0.0
1718	15.7	15.7	0.0
1575	15.2	15.2	0.0
1459	15.2	15.2	0.0
1406	15.2	15.2	0.0
Culvert			
1337	13.2	13.1	0.1
1274	12.7	12.7	0.0
1119	12.2	12.2	0.0
915	11.2	11.2	0.0

These results indicate that the culvert replacement will not cause any impacts to flood depths or extents within City of Watsonville or County of Santa Cruz jurisdictions.

Maintenance

When the Watsonville Slough channel thalweg was surveyed in early October 2020 by MME, it was observed that the private property owners/farmers of the properties downstream of the Lee Road culvert (and adjacent to Watsonville Slough) periodically dredge sediment from the slough channel to maintain channel capacity. Prior to final construction permits, the project team will develop agreement documentations with the downstream private property owners that will confirm their acceptance of the proposed road runoff and confirm their responsibility related to the ongoing long-term maintenance of Watsonville Slough channel sedimentation.

Next Steps

Because the model results show that the proposed culvert improvements will satisfy the “no-rise condition” (meaning that the 100-year water surface elevations in the project vicinity do not increase as a result of the proposed project), a no-rise certification, and associated correspondence with the City and

County floodplain managers, will occur once the culvert design is at the 100% design level. This approach is accepted under both the City of Watsonville[8] and Santa Cruz County[9] floodplain ordinances.

Limitations

The analysis and model results described in this letter are intended to support the design of the Lee Road Trail project. The proposed condition calculations assume the trail design described in the 65% design plans, dated October 2020 and designed by MME, and further analyses may be needed confirm that future iterations of the design will meet regulatory criteria upon changes to the alignment and/or dimensions.

Additionally, this report is focused on hydraulic modeling and analysis of the Lee Road culvert for the purposes of FEMA compliance and floodplain management. Should additional City design criteria and/or standards apply to this culvert crossing, these criteria shall be evaluated and accommodated for as the design progresses in the future phase. That said, we believe that even with revisions to the culvert design (as presented in this report), a no-rise condition is feasible at this site. If you have any further questions about the study or the results presented herein, please do not hesitate to contact us.

Sincerely,

BALANCE HYDROLOGICS, Inc.

Montana Marshall

Montana Marshall, P.E., CFM
Civil Engineer/Hydrologist

Edward D. Ballman

Edward Ballman, P.E., CFM
Principal Engineer

Enclosures: Attachment 1. Lee Road culvert, existing condition
Attachment 2. Lee Road culvert, proposed design (*published by MME in October 2020*)
Attachment 3. Watsonville Slough FIRM Panel (*06087C0394E*)
Attachment 4. Watsonville Slough FIS Profile
Attachment 5. HEC-RAS Model Information and Results

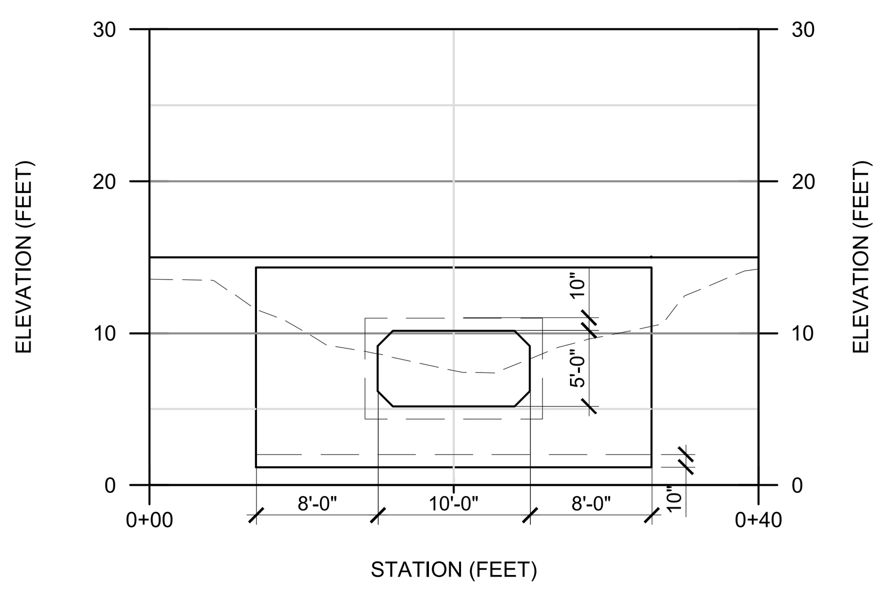
[8] 9-2.505.b Standards for Floodway Development. Within an adopted regulatory floodway, the City of Watsonville shall prohibit encroachments, including new fill, new construction, substantial improvements, and other development, unless certification by a registered civil engineer is provided demonstrating that the proposed encroachment shall not result in any increase in flood levels during occurrence of the base flood discharge.
[9] 16.10.070.G.5 Alteration of Structures in Floodway. Reconstruction, repair, alteration or improvement of a structure in a floodway shall not cause any increase in the base flood elevation.

ATTACHMENT 1.
LEE ROAD CULVERT, EXISTING CONDITION

Looking upstream

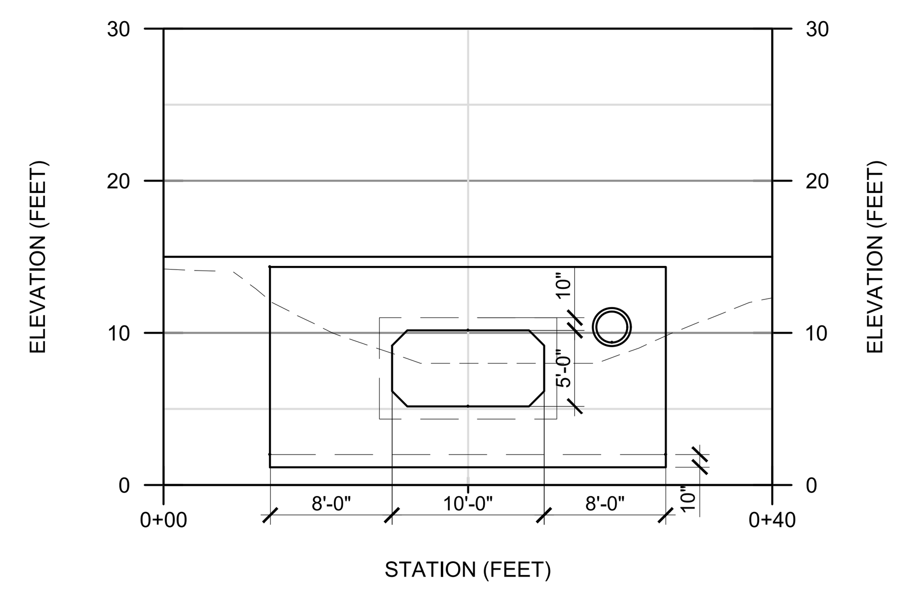
Looking downstream

ATTACHMENT 2.
LEE ROAD CULVERT, PROPOSED CONDITION
(published by MME in October 2020)



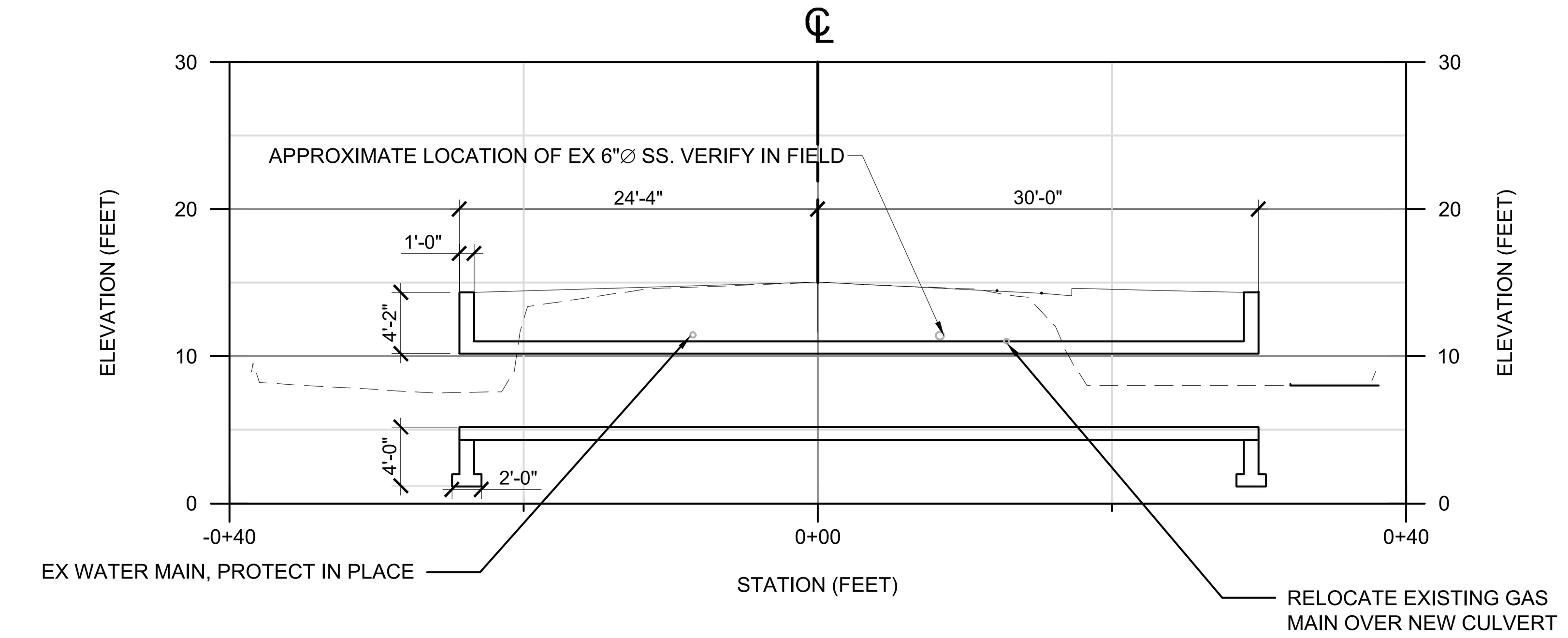
EAST END WALL (A)

SCALE: 1" = 10'



WEST END WALL (B)

SCALE: 1" = 10'



CULVERT FLOWLINE PROFILE (C)

SCALE: 1" = 10'

CULVERT PLAN

SCALE: 1" = 10'

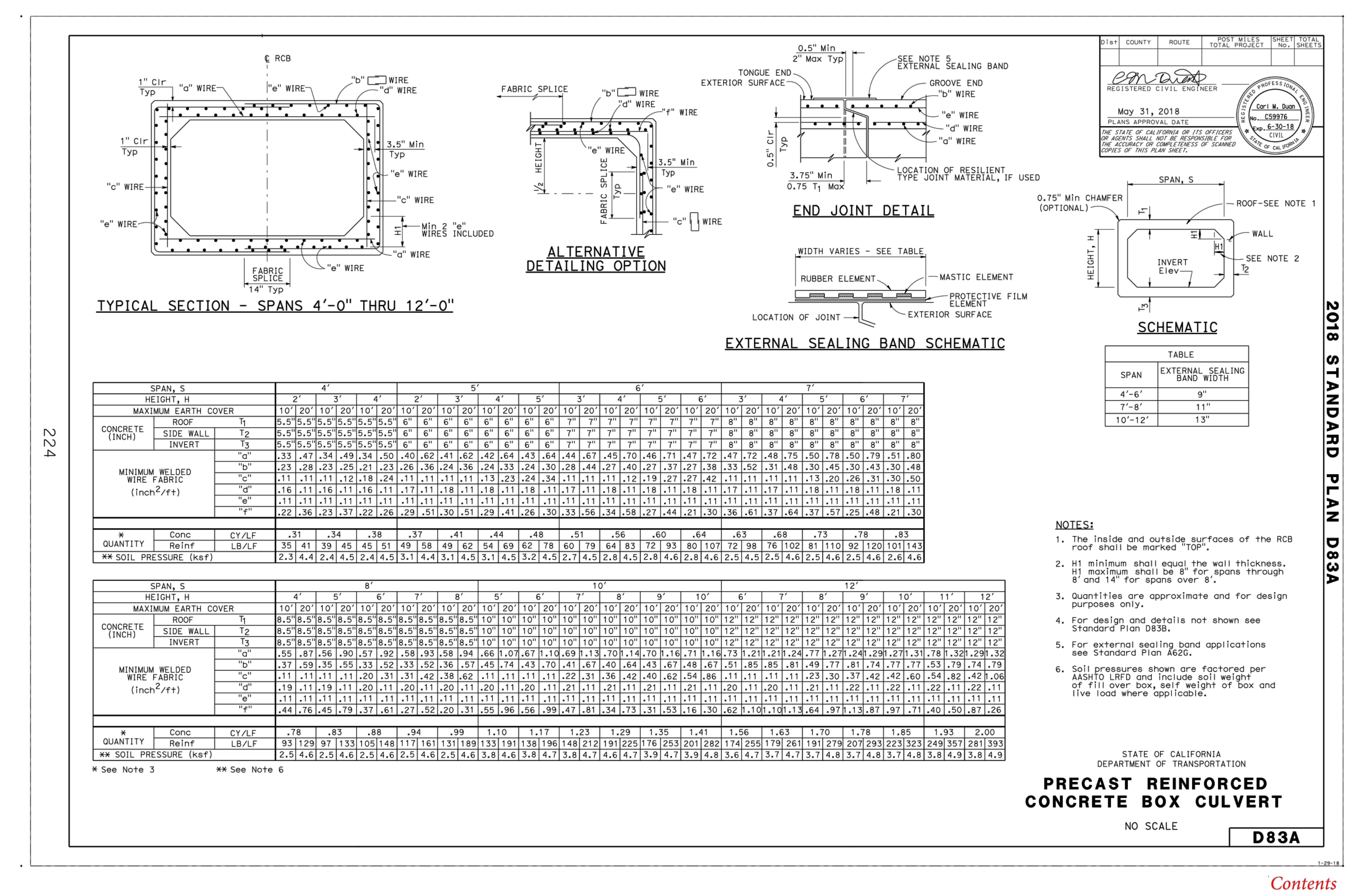
CULVERT NOTES

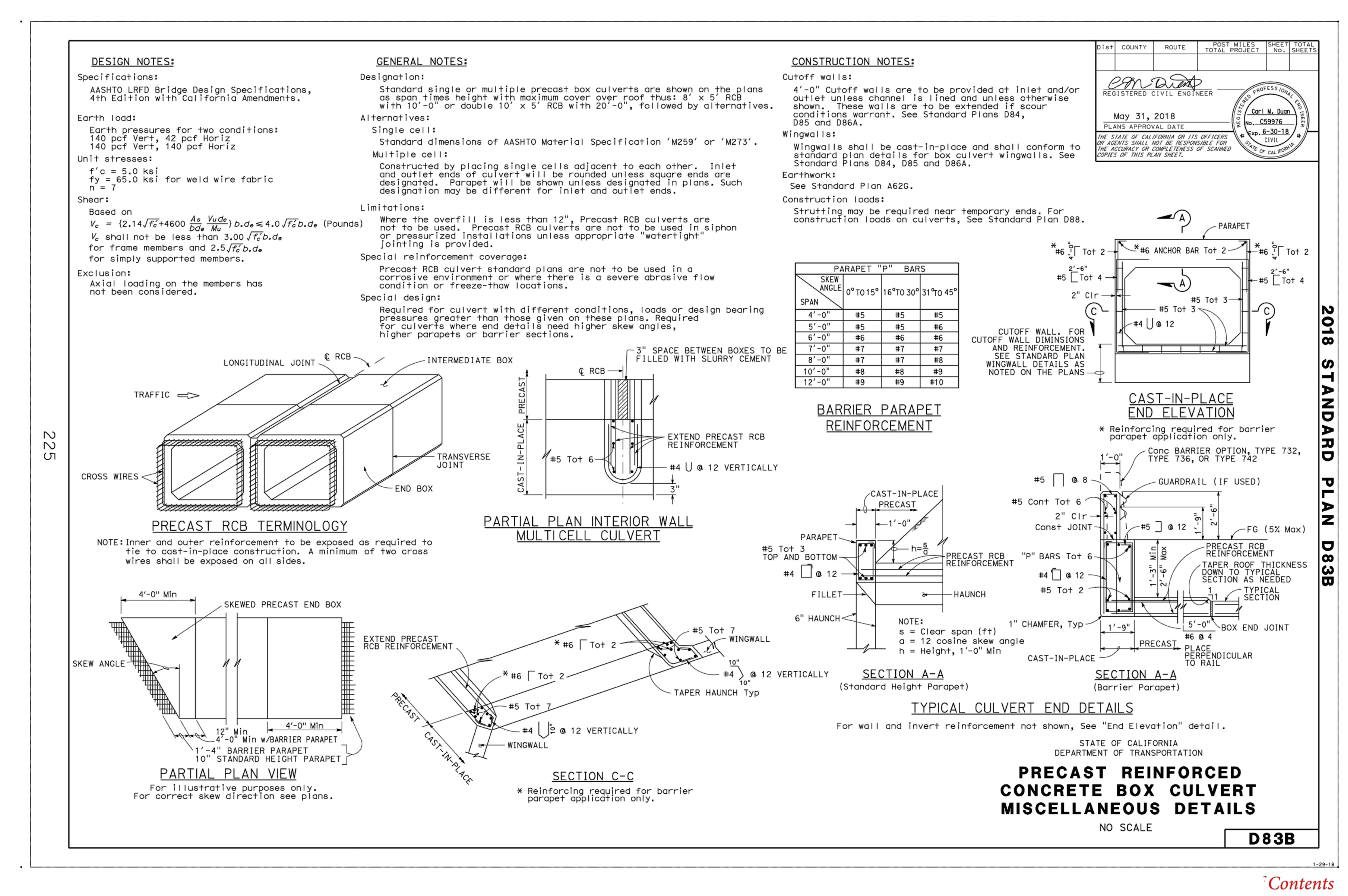
TRANSVERSE JOINTS IN THE PRECAST CONCRETE CULVERT ARE ALLOWED PROVIDED THE JOINTS ARE CONSTRUCTED IN FULL CONFORMANCE WITH THE STANDARD PLANS.

LOCATIONS OF TRANSVERSE CONSTRUCTION JOINTS SHALL BE DETERMINED BY THE CONTRACTOR TO ACCOMMODATE THE CONSTRUCTION METHOD CONSTRUCTION SEQUENCE SELECTED BY THE CONTRACTOR.

ONE LANE OF TRAFFIC SHALL BE KEPT OPEN FOR THE DURATION OF THE CULVERT CONSTRUCTION OPERATIONS. THE MINIMUM LAND WIDTH TO BE MAINTAINED AT ALL TIMES IS 12 FEET CLEAR. CONTRACTOR SHALL ARRANGE ALL OPERATIONS ACCORDINGLY AND PROVIDE TRAFFIC CONTROL AS MAY BE REQUIRED FOR SAFE VEHICULAR PASSAGE THROUGH THE CONSTRUCTION AREA WHENEVER LESS THAN TWO LANES ARE AVAILABLE.

IN THE EVENT TRAFFIC CONTROL MEASURES ARE REQUIRED TO SUCCESSFULLY COMPLETE SOME PORTIONS OF THE WORK, THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE ENGINEER AND TO THE DEPARTMENT OF PUBLIC WORKS FOR REVIEW A MINIMUM OF (30) DAYS BEFORE ANY SUCH WORK BEGINS. NO WORK WITHIN THE RIGHT-OF-WAY MAY BEGIN BEFORE THE DEPARTMENT OF PUBLIC WORKS APPROVES THE TRAFFIC CONTROL PLAN. IF NECESSARY, TRAFFIC CONTROL SHALL CONSIST OF CLOSING TRAFFIC LANES IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN.





REV.	DESCRIPTION	BY	DATE
1	65% PLANS	RC	10/28/2020

MME
CIVIL+STRUCTURAL ENGINEERING
224 Walnut Ave, Suite B Santa Cruz, CA 95060
Phone (831) 426-3186 www.m-me.com

PRELIMINARY NOT FOR CONSTRUCTION

LEE ROAD TRAIL

PREPARED AT THE REQUEST OF
MURRAY FONTES
CITY OF WATSONVILLE PUBLIC WORKS
250 MAIN STREET
WATSONVILLE, CA 95076

CULVERT DETAILS

DRAWN BY:	AH
CHECKED BY:	RC
JOB NUMBER:	18196

SHEET

C6.0

ATTACHMENT 3.
WATSONVILLE SLOUGH FIRM PANEL

National Flood Hazard Layer FIRMette

FEMA

36°54'20.02"N

121°47'9.79"W

121°46'32.34"W

36°53'51.25"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

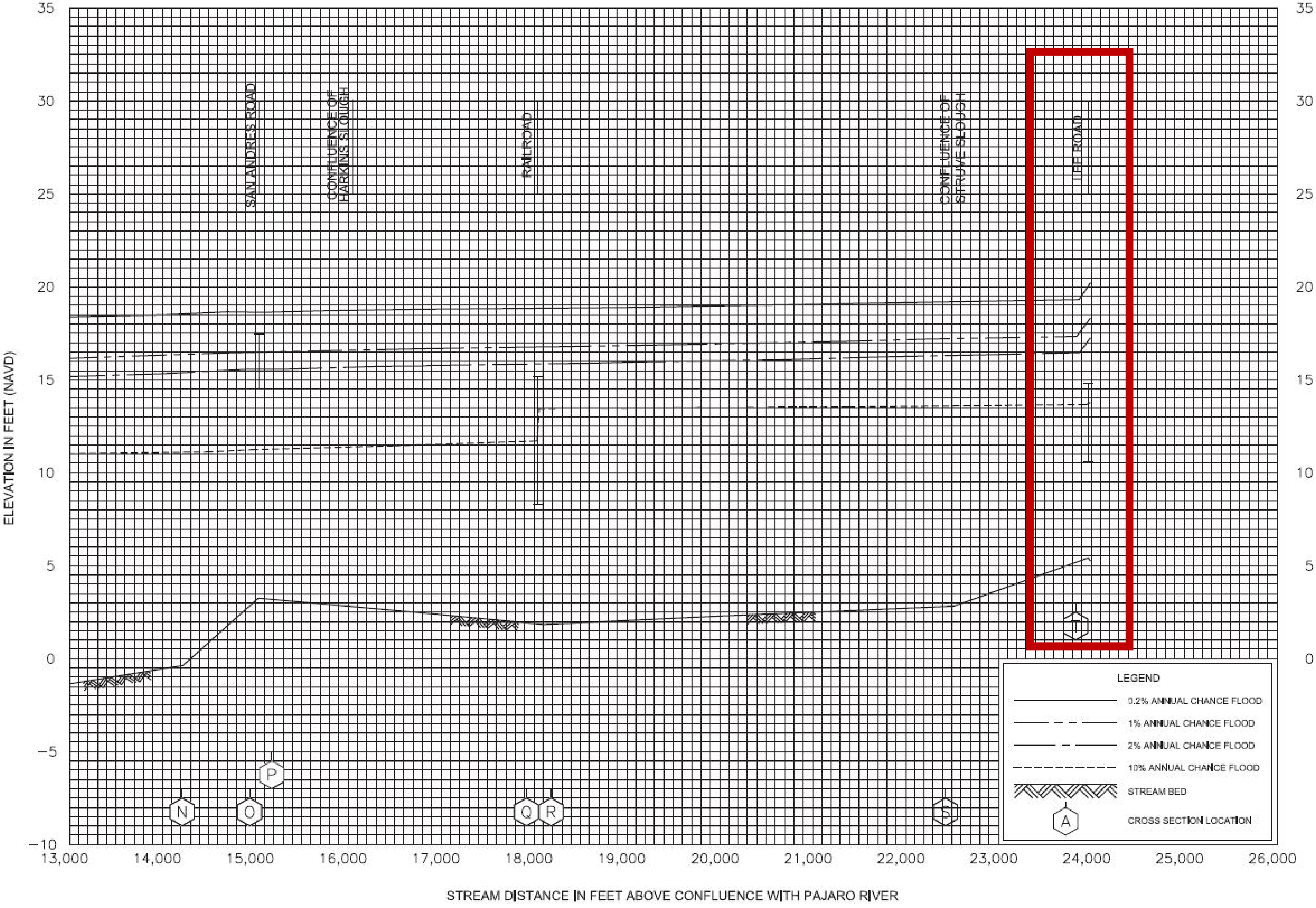
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/21/2019 at 8:15:05 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ATTACHMENT 4.
WATSONVILLE SLOUGH FIS PROFILE



FLOOD PROFILES

WATSONVILLE SLOUGH

FEDERAL EMERGENCY MANAGEMENT AGENCY

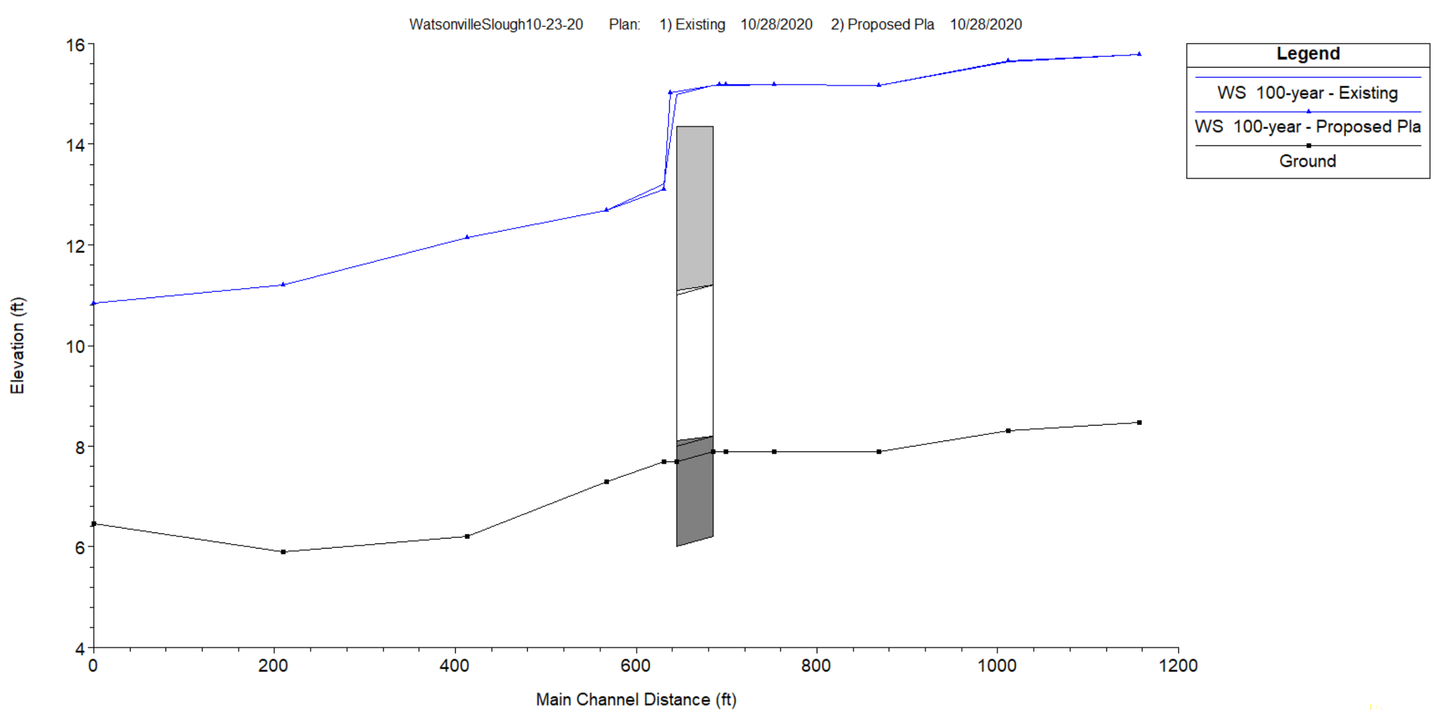
SANTA CRUZ COUNTY, CA AND INCORPORATED AREAS

77P

ATTACHMENT 5.
HEC-RAS MODEL INFORMATION AND RESULTS

Model Layout

Model Results (Longitudinal Profile)



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Attachment I

Approval Letter from
County of Santa Cruz

for

Phase 1 Archaeological Investigations (September 2020)
Confidential – Not Included

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County of Santa Cruz

PLANNING DEPARTMENT
701 Ocean Street, 4th floor, Santa Cruz, Ca 95060
(831) 454-2580 Fax: (831) 454-2131 Tdd: (831) 454-2123
Kathleen Molloy, Planning director

Kate Gibberson
Harris & Associates
450 Lincoln Avenue, Suite 103
Salinas, CA 93901
Kate.Giberson@weareharris.com

October 19, 2020

Subject: Lee Road Trail Project Cultural Resources Report Review and Conditioned Approval
APN: Road Rights of Way Santa Cruz County and City of Watsonville; APN 052-091-41
Application #s: REV201061; 201188

Attachment 1. Phase I Archaeological Investigation (Confidential Report)

Dear Ms. Gibberson,

The Planning Department received and reviewed a Phase I Archaeological Investigation dated September 2020, prepared by Douglas Ross, Ph.D., RPA of Albion Environmental, Inc. for the Lee Road Trail Project. Archaeological Report Review was required because of the potential for disturbance of significant Native American cultural sites in the proposed project disturbance area where grading, installation of a concrete path, construction of a bridge, and other development activities are proposed. The Phase I Archaeological report is included as Attachment 1 for reference. This report may include sensitive information that should not be circulated for public review.

Project Description

Portions of the proposed project are located within the jurisdiction of the City of Watsonville, and the remainder of the project is in unincorporated Santa Cruz County within the Coastal Zone.

The proposed project involves creation of 1.43-miles of pedestrian/bicycle access between Pajaro Valley High School and the City of Watsonville's existing and proposed trail systems to the south including the Land Trust of Santa Cruz County's Watsonville Slough Farm west of Lee Road, the Manabe-Ow Trail and Lower Watsonville Slough Trail east of Highway 1, and the Monterey Bay Sanctuary Scenic Trail Network (MBSST Rail Trail) at the south end of the proposed project. There is currently no through access on Lee Road because a portion of the Road is submerged under the waters of Struve Slough.

The proposed project would install approximately 0.72-mile of new concrete pedestrian/bicycle path and construct a new 940-foot-long pedestrian/bicycle bridge over Struve Slough. The proposed project also includes installation of new sidewalks along Harkins Slough Road and Lee Road, restriping portions of Harkins Slough Road and Lee Road to add new crosswalks and bicycle lanes, pavement widening of a portion of Lee Road (south of Struve Slough) to accommodate bicycle lanes, replacement of the existing culvert where Lee Road crosses a channelized portion of Watsonville Slough, and installation of Educational/interpretive signage and fencing along the east side of Lee Road (north of Struve Slough) where the new pedestrian/bicycle path is proposed along the edge of the California Department of Fish and Wildlife (CDFW) Watsonville Slough Ecological Reserve.

The new pedestrian/bicycle paths would be constructed of 8-foot-wide pervious concrete with 2-foot-wide unpaved shoulders, and would be installed in two separate locations along the project alignment: Approximately 0.60-mile of trail would occur parallel to, and along the east side, of Lee Road about 5 feet from the existing pavement. Another 0.12-mile of new path would be installed on the alignment of an existing dirt trail parallel to Watsonville Slough that extends perpendicularly east from Lee Road under Highway 1 to the convergence with the existing Manabe-Ow Trail.

Through traffic along Lee Road is restricted on both sides of Struve Slough by chain link gates. Between these gates, approximately 500 feet of pavement occurs before the existing paved original grade of Lee Road is submerged under the waters of Struve Slough. At each gate, the trail alignment would transition onto the existing pavement. Both gates would be modified as part of the trail project with improvements to allow pedestrian and bicycle access while still restricting public vehicular access. A new 12-foot-wide, 940-foot-long pedestrian/bicycle bridge over Struve Slough would be constructed to connect the two sides. The bridge would be constructed with abutments on each end and up to 4 piers within Struve Slough. Installation of a water diversion system in Struve Slough will be required to install the new bridge. Access for installation of the bridge piers is proposed to occur on the existing paved road surface that occurs below the OHWM of the Slough once the area is dewatered.

South of Struve Slough, Lee Road would be widened on both sides to accommodate bicycle lanes. Installation of a sidewalk is proposed along the west side of the roadway beyond the gate. An existing storm drainage ditch along the east side of the road, south of the slough would be filled in and replaced with a stormdrain pipe to accommodate the road widening to the east. This pipe would outfall into Watsonville Slough.

Grading will occur at a maximum depth of 18 inches for trail construction and up to 125 feet deep for excavation of the bridge piers and abutments.

Two separate portions of the project area will be constructed in different phases of project implementation: Phase 1 of project implementation includes the portion of Lee Road North of Struve Slough, which is located between Harkins Slough Road and the Struve Slough Bridge. Phase 2 of project implementation includes the portion between the Struve Slough Bridge and Watsonville Slough.

Analysis

In order to comply with County Ordinances (SCCC Chapter 16.40), the California Environmental Quality Act (CEQA), and Section 106 of the National Historic Preservation Act (NHPA), Albion completed the following tasks: 1) Background historical research and a records search at the Northwest Information Center (NWIC); 2) Initial outreach with the Native American Heritage Commission and local Native American Tribes on behalf of the lead agency, to determine if there are any Tribal or other cultural resources in the APE of significance to these communities; 3) Pedestrian field survey of the entire APE; and 4) Cultural resources report.

A search of records at NWIC indicated that the following three cultural resources had been previously recorded within the Project APE: A Costanoan-Ohlone Cemetery Site (CA-SCR-107), the Santa Cruz Branch of the Southern Pacific Railroad (P-44-000377), and Highway 1 (CA-SCR-334H).

Harris & Associates contacted the California Native American Heritage Commission in August 2020 for information from the Commission's Sacred Lands File and a list of stakeholders. The Commission found no information in their files and forwarded the names of six Tribal representatives. Harris & Associates contacted each of these representatives by letter, and follow-up emails and phone calls, describing the project and asking for information or comments. Five representatives provided responses as outlined in detail in the attached Report. Recommendations made by Tribal representatives during these outreach efforts have been incorporated into the conditions of approval below.

Albion's Phase I Archaeological Investigation concludes that there is an archaeological site (the Costanoan-Ohlone Cemetery Site) within the APE that qualifies as a historical resource under CEQA and as an historic property under the NHPA. Ground disturbing project activities have the potential to cause adverse effects to this resource. In addition, given the presence of multiple known precontact and historic period sites in and within a half-mile of the APE, there is a possibility that additional subsurface archaeological resources exist that are not visible on the surface or on available historic imagery, and therefore not identified during field studies.

The Phase I Archaeological Investigation report recommends that the Project hire a trained archaeologist to design and implement a cultural resources Treatment Plan to undertake pre-construction archaeological testing of CA-SCR-107 where it intersects with proposed ground disturbing Project activities, and any other sensitive locations within the APE identified by the archaeologist or Native American representatives. The goal of the testing is to determine if intact archaeological deposits or ancestral human remains survive in these locations, assess the nature of these deposits if present, and recommend any additional protective measures. Albion's report also recommends the Project hire a trained archaeologist to develop and implement a formal monitoring plan to undertake targeted archaeological and Native American monitoring of construction within the APE, and includes recommendations for cultural resource awareness training for all construction crews and archaeological and Tribal monitoring of ground disturbing construction activities.

Conclusion

There are constraints associated with sensitive archaeological, historic, and Tribal cultural resources on the project site that must be considered prior to and during project implementation. The impact area for the proposed new pedestrian/bicycle paths and sidewalks is largely located within or directly adjacent to prior disturbed areas including the developed footprint of roadways, ruderal road shoulders, and previously developed areas.

Albion's Phase I Archaeological Investigation concludes that there is an archaeological site (the Costanoan-Ohlone Cemetery Site) within the APE that qualifies as a historical resource under CEQA and as an historic property under the NHPA. Ground disturbing activities associated with the proposed project have the potential to result in significant impacts to this resource. In addition, given the presence of multiple known precontact and historic period sites in, and within a half-mile of the APE, there is a possibility that additional buried sites exist that are not visible on the surface or on available historic imagery, and therefore not identified during field studies.

Recommendations made by Albion in their Phase I Archaeological Investigation and Tribal representatives during Tribal outreach efforts have been incorporated into the conditions of approval below to ensure that impacts to Cultural Resources and Tribal Cultural Resources will be *less than significant.* The Conditions of Approval below shall be incorporated into all phases of development for this project as applicable.

Conditions of Approval

To conduct development activities for the Lee Road Trail Project and minimize impacts to Cultural Resources and Tribal Cultural Resources to less than significant, the following conditions shall be adhered to:

I. Prior to any site disturbance, a pre-construction meeting shall be conducted. The purpose of the meeting will be to ensure that the conditions set forth in the proposed project description and permit requirements are communicated to the various parties responsible for constructing the project. The meeting shall involve all relevant parties including the project proponent, construction supervisor, the project Archaeologist, and the Native American Monitor.

II. A California trained Archaeologist and qualified trained Native American Monitor shall be on site during all ground-disturbing activities in the vicinity of CA-SCR-107 and any other areas where monitoring is determined necessary through Native American Consultation and pre-construction testing. Both monitors shall have the authority to stop construction to implement the Archaeological Treatment Plan if necessary.

III. A Construction Monitoring Plan for Cultural Resources and Human Remains shall be prepared by a qualified Archaeologist. This formal monitoring plan shall be intended to provide a detailed outline for targeted archaeological monitoring of construction in the project area. The monitoring plan shall be a standalone document prepared in conjunction with the Archaeological Treatment Plan.

IV. In consultation with Native American Tribes and the County an Archaeological Treatment Plan shall be prepared by a qualified archaeologist for implementation during all ground disturbance associated with the project (including archaeological testing activities). The Archaeological Treatment Plan shall outline the treatment of archaeological resources encountered during ground disturbance and shall include the following at minimum:

- Background information that summarizes the sensitivity of the project area for archaeological resources and significant Native American Cultural Sites.
- Describe the specific locations and methods of pre-construction archaeological testing activities for the two different construction phases as outlined below.
    - Testing shall be undertaken to the maximum depth of planned project impacts with a Native American monitor present at all times.
    - The goal of this testing shall be to determine if intact archaeological deposits or ancestral human remains survive in these locations, assess the nature of these deposits, and recommend any additional protective measures to be implemented.
    - Archaeological testing for Phase 1 on the north side of Struve Slough shall be comprised of clearing/mowing of vegetation along the trail alignment, additional surface surveys to identify any necessary testing locations, and excavation of a series of shovel probes to be determined in coordination with a Native American representative.
    - Archaeological testing for Phase 2 on the south side of Struve Slough shall be undertaken on both sides of Lee Road, using hand and/or mechanical excavation methods, in locations determined in coordination with a Native American representative. Specific care and instructions should be directed to where the previously recorded Costanoan-Ohlone Cemetery Site (CA-SCR-107) intersects with proposed ground disturbing project activities.
- Avoidance and preservation in place is the preferred method of treatment. Archaeological resources shall be avoided and preserved in place as much as feasible. Reasonable efforts shall be made to preserve archaeological resources in place or leave in an undisturbed state.

- Describe the methods for identification, evaluation, and treatment of any discoveries (e.g., leave in place and cap based on Native American recommendations).
- Outline the notification procedures given in SCCC Chapter 16.40 for discovery of archaeological resources and human remains.
- If disturbance is unavoidable, the preferred method of treatment would be to record any data necessary to adequately document the scientifically consequential information from and about the disturbed historical resource, and then return all artifacts as close to their original location as possible before capping or covering with soil.

V. All construction personnel working on the project shall receive cultural sensitivity training conducted by a California trained Archaeological monitor and qualified trained Native American Monitor. Cultural sensitivity training shall occur before a person is authorized to work at the project site.

VI. Pursuant to section 16.40.040 of the SCCC, if archaeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification procedures given in SCCC Chapter 16.40.

These conditions should be incorporated as mitigation into the CEQA document prior to public circulation. By complying with these conditions, the project will result in *no significant impacts* to Cultural Resources or Tribal Cultural Resources.

A copy of this approval should be submitted with any future permit applications.

If you have any questions regarding this letter, please feel free to contact me by email or telephone at Juliette.Robinson@santacruzcounty.us or 831-454-3156.

Sincerely,

Juliette Robinson
Resource Planner IV

CC: Leah MacCarter, Area Resource Planner
Matt Johnston, Environmental Coordinator
Randall Adams, Project Planner

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