City of Arcata
Living Shorelines Project

INITIAL STUDY &
MITIGATED NEGATIVE DECLARATION

May 2019

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Project Title

Arcata Living Shorelines Pilot Project

Lead Agency

City of Arcata

Project Applicant

City of Arcata
Environmental Services Division
736 F Street
Arcata, CA 95521

Project Location

Arcata Marsh Wildlife Sanctuary, Arcata, CA

General Plan Land Use Designation & Zoning

The project area is in Humboldt Bay proper and has no zoning designation, adjacent lands are zoned Natural Resource Protection (NRP). The project area has not been assigned assessor parcel numbers, as they are untaxed.

Project Description

Arcata's Wastewater Treatment Plan (WWTP) has been identified as the City's most critical facility that could be affected by sea-level rise. The WWTP is also within Arcata Marsh and Wildlife Sanctuary (AMWS), which provides important public access and recreation opportunities within the city. Together, these facilities are valued at $40 million. A system of dikes armored with rock slope protection (rsp) are currently in place to prevent tidal inundation. However, current sea level rise projections, combined with more frequent storms of higher intensity associated with climate change, put the WWTP and AMWS at risk of inundation.

The City desires to test various living shoreline construction methods and materials in different wave environments to observe sediment accretion and establishment of salt marsh vegetation. There are two main goals of this project. One goal is to explore the effectiveness of different "living shorelines" approaches in buffering dikes from impacts associated with sea level rise and increased wave action. The second goal is to encourage sediment accretion and restoration of salt marsh habitat and associated ecosystem services, which comprises approximately 10% of its original habitat area within Humboldt Bay.

Three pilot projects concept designs (Pilot Cell A, B, and C) have been developed to accrete sediment, establish salt marsh habitat, and soften the shorelines within North Humboldt Bay at four pilot project sites, in areas with existing dikes along City of Arcata owned property (Appendix A, Sheet C1). Areas of focus include along I Street, across from Hauser Marsh and along the eastern end of the South Oxidation Pond of the WWTP. The specific placement and location of materials have been designed at elevations needed to accumulate and trap sediment to establish native salt marsh vegetation.

Up to 13 wetland log structures will also be installed along the eastern edge of the oxidation ponds (Appendix A, Sheet 8). Historically, coastal wetlands were likely terminal locations for large wood. The wetland log structures will provide habitat for wildlife, birds, and, during higher tides, fish and other aquatic species.

Once installed, the City of Arcata will monitor the four pilot project sites, as well as the wetland log structures, to see which design best achieve project goals and is most suitable for replication at additional sites in the AMWS and/or other properties within City limits. Once monitoring is complete, unsuccessful pilot projects that fail to meet project goals, if any, will be dismantled and removed.

Common Design Elements

Each of the four pilot sites includes application of a combination of three methods: Pilot Cell A, B, or C (Appendix A, Sheets C2-C5). The first Pilot Cell A method applies a combination of staked coir logs, oyster shell bags, and willow wattles and is implemented with hand labor only. Pilot Cell B is like Pilot Cell A, only differing in the shape of each cell. Pilot Cell A installations have a crescent shape, whereas Pilot Cell B installations are shaped like a rectangular with rounded corners.

The third Pilot Cell C method includes the use of large rock rip rap, in addition to the coir logs, and is implemented with heavy equipment.

All three Pilot Cell approaches apply the same general dimensions, with a maximum width of 100 ft and a maximum depth from the shore of 30 ft. Pilot project site 1 is 0.30 acres, pilot project site 2 is 0.12 acres, pilot project site 3 is 0.14 acres, and pilot site 4 is 0.22 acres. Total project area will be 0.78 acres (34,100 square feet). Design components have been bolstered from literature produced by the Partnership for the Delaware Estuary (Kreeger et al. 2011); installation examples and instructions for the pilot projects that can be installed by hand are included in Appendix B.

Over time, the living shoreline structures are expected to accrete sediments in place to create salt marsh plains to buffer the AMWS from future sea level rise impacts. The targeted elevation for the salt marsh plains is 6.05 ft to 7.25 ft NAVD88.

After installation, the efficacy of all three treatment types (A, B, and C) and various combinations thereof (see Appendix A), will be evaluated to determine which treatment type(s) will be most suitable for a future, large scale application of living shorelines along the AMWS and other City of Arcata properties adjacent to or near Humboldt Bay and its tributaries. Evaluations will be based, in part, on the ability of each treatment type to accrete sediment and successfully create new salt marsh habitat and attenuate heightened wave action.

Pilot Cell A– Coir Logs with Rectangular Shape

Pilot Cell A is designed to be a low-tech alternative. Key elements include a hands-on approach and ease of implementation. Emphasis is placed on a soft-shoreline approach. Design and materials are closely based on existing Living Shoreline techniques found in the literature produced by the Partnership for the Delaware Estuary (Kreeger et al. 2011). Pilot Cell A consists of two tiers of coir logs staked into the existing ground approximately 15 ft and 30 ft away from the shoreline, respectively (Appendix A, Sheets C2-C4). Coir fiber is placed on the existing ground prior to log installation. Oyster shell bags may be placed at the toe of the staked coir logs to protect against erosion.

Sites using the Pilot Cell A approach will also include two tiers of willow wattles staked into the existing ground approximately 15 ft and 30 ft away from the shoreline, respectively (Appendix A, Sheets C2-C4). Coir fiber may be placed on the existing ground prior to wattle installation. Oyster shell bags may be placed at the toe of the wattles to protect against erosion. Primary components consist of the following materials:

- Locally sourced willow wattles
- Large logs (12-30 in diameter)
- Jute oyster shell bags (no plastic ties)
- Coir mats
- Wooden stakes (not pressure treated or coated)

Pilot Cell B– Coir Logs with Crescent Shape

The Pilot Cell B approach is identical to the Pilot Cell A approach, utilizing the same materials and installation. The two pilot cells are differentiated only by shape. Pilot Cell B is a crescent shape, compared to the rounded rectangular shape of Pilot Cell A. The two shapes can be evaluated over time to see if one is ultimately more successful at establishing salt marsh and protecting the AMWS from impacts related to sea level rise (Appendix A, Sheets C2-C4).

Pilot Cell C – Hard Armoring

The Pilot Cell C approach is the most engineered of the proposed pilot project techniques and will be applied at only one of the three pilot project sites. Design layout is based on existing Living Shoreline techniques found in the literature produced by the Partnership for the Delaware Estuary (Kreeger et al. 2011), but a hard-armoring approach is taken to protect the toe and help attenuate high energy and wind-wave conditions. This approach consists of a single inner tier of either coir logs or willow wattles staked into the existing ground approximately 15 ft away from the living shoreline. A second tier constructed of riprap, as a hard-armoring sill, is 30 ft away from the shoreline (Appendix A, Sheet C5). Approximately 700 cubic yards of rock (2-ton) will be required for to implement the Pilot Cell C approach. Coir fiber may be placed on the existing ground prior to log installation. Fill soil will not be imported. Primary components consist of the following materials:

- Riprap for sock sill (1-2 ton rock)
- Large logs (12-30 in diameter)
- Coir logs/willow wattles
- Wooden stakes
- Coir mats

Large Wood Installations

Up to thirteen wetland log structures will be located along the eastern edge of the Oxidation Ponds (Appendix A, Sheet C1). The wetland log structures will provide niches for sediment and vegetation to take hold and, over time, provide additional shoreline protection to mitigate anticipated impacts from sea level rise. The wetland log structures will also serve as carbon sources.

Primary logs used in the wetland log structure range between 12 and 19 inches in diameter and between16 and 20 ft in length. Each structure will include two primary logs (up to 26 total). In addition, two pinning logs will be used for each structure (up to 26 total). Pinning logs range between 6 and 12 inches in diameter and between 16 and 20 ft in length.

Log species include Western hemlock (*Tsuga heterophylla),* Sitka spruce (*Picea sitchensis),* and Douglas fir (*Pseudotsuga menziesii*). All logs will be locally-sourced and untreated.

The wetland log structures will be anchored with up to 36 2-ton rocks (total for the 13 wetland log structures) to prevent the structures from floating away during high tides and storms. Smaller diameter logs (6 to12-inch diameter) will also be used, in combination with the 2-ton rocks, to anchor the wetland log structures. Anchors will be limited to untreated pinning logs only and will not include cables or other metal devices (e.g., bolts).

Installation

All work will be performed during the low tide, when no water is present. Each pilot site is designed with habitat value and material costs as foremost considerations.

Pilot sites using Pilot Cell A and/or Pilot Cell B will be installed using hand tools only in accordance with Appendix B. Hand tools will be used to slightly dig the coir logs into the mud flats. During installation, milled plant logs (boards) will be placed across the mudflats along paths of repeat foot traffic to minimize impacts to the mudflat environment and decrease related erosion and turbidity that may occur during high tides after implementation is complete. Works and/or volunteers installing the coir logs will also use mudders during installation to minimize mudflat disturbance.

Pilot Cell C site will require mechanized equipment. No mechanized equipment will be operated in the bay. Equipment will be staged from the dike surrounding Humboldt Bay and will not operate on the mudflats or salt marsh.

Passive Salt Marsh Recolonization

Rather than planting salt marsh species, the project will allow salt marsh vegetation to naturally colonize newly accreted sediments in the pilot project sites. Once installed, the pilot projects will passively accrete sediments to establish the elevation necessary for salt marsh to establish. The pilot project sites initially will not be immediately suitable for salt marsh to establish, although the willow wattles incorporated into the structures may establish and grow pending their ultimate exposure to and tolerance of salinity.

Additionally, passive salt marsh colonization has been applied to other salt marsh restoration projects along Humboldt Bay in recent years, such as Salmon Creek and now proposed at the Elk River estuary, with significant success. At Salmon Creek, the colonization of pickle weed occurred within one year of construction.

Passive recolonization minimizes soil disturbance, reduces costs, and promotes a more balanced, nature-driven approach to post-construction revegetation.

Short-Term Maintenance

If needed, the City will maintain the pilot project installations for up to five years for small repairs to save the structures as needed (e.g., damage from large storm events). Short-term maintenance activities will not include reconstructing structures entirely or other activities that exceed the definition of small repairs.

Summary of Project Actions

1. Install coir logs at all three pilot site locations using wooden stakes and twine.
2. Place oyster shell bags along outside edge of living shoreline (Pilot Cell A and B sites only).
3. Install willow wattles between coir logs
4. Install rip rap (700 CY of 2-ton rock, approx. 36") along outside edge of living shoreline (Pilot Cell C sites only).
5. Install 52 pieces of large wood at up to thirteen locations. An additional 18 pieces of large wood (peeler logs) will be included within the pilot cell living shoreline structures.
6. Passive salt marsh recolonization.
7. Short-term (5 year) maintenance, as needed, for small repairs.

Environmental Setting

The AMWS is home to the City of Arcata's innovative wastewater treatment facility. The sanctuary is 307 acres, including freshwater marshes, salt marsh, tidal sloughs, grassy uplands, mudflats, brackish marsh, approximately five miles of walking and biking paths and an Interpretive Center (Figure 1). By integrating conventional wastewater treatment with the natural processes of constructed wetlands, Arcata has succeeded in turning wastewater into a resource.

Located at the north end of Humboldt Bay, the AMWS is situated along the Pacific Flyway, a major migratory route for thousands of birds that breed in the far north and winter in California, Mexico and Central and South America. The AMWS Sanctuary has probably the highest bird populated coastal site between Bodega Harbor and Washington, with literally thousands of birding visitors annually and organized bird walks held at least weekly year-round. The AMWS has hosted over 300 bird species.

To analyze potential biologic impacts, a Biotic Constraints Assessment was prepared by H.T. Harvey & Associates in October, 2015 (H.T. Harvey 2015). Sensitive habitats identified in the report include salt marsh, intertidal mud flat, and subtidal slough channel (H.T. Harvey 2015). The report also identifies sensitive species that may be located in the project vicinity.

The project will be designed to avoid impacts to existing salt marsh habitat to the extent practicable, and to fully avoid eel grass habitat. Although salt marsh habitat was identified within the project vicinity, at the toe of the dikes, the majority of this salt marsh is comprised of invasive cordgrass (*Spartina densiflora)*. Furthermore, the salt marsh that will be created by this project will be a greater area than what currently exists. As noted previously, the specific placement and location of materials will be designed to be at elevations needed to accumulate and trap sediment to establish native salt marsh vegetation.

Most of the project area consists of unvegetated intertidal mudflats. Humboldt Bay's intertidal mudflats provide important foraging habitat for non-breeding shorebirds and habitat for invertebrates living below the substrate surface (H.T. Harvey 2015). Although mudflats will be impacted by the project, the impacts will result in a conversion from mudflat to salt marsh, with no net loss of wetlands.

Historically, the original U.S. Surveyor General Township Plats of 1854 depicted Humboldt Bay as occupying approximately 25,800 acres, of which 15,300 acres (59.3 percent) were tidal channels and inter-tidal mudflats, and 10,500 acres (40.7 percent) were inter-tidal wetlands, salt marsh (Laird 2007). Today, salt marsh occupies just four percent of Humboldt Bay (Barnhart 1992).

The project will result in the conversion of approximately 0.45-acres of mudflat to salt marsh, most of which will occur through natural sediment accretion. Mudflat that is exposed during low tide currently comprises approximately 11,200 acres (Costa 1982) of Humboldt Bay. This amount of conversion represents a decrease of approximately 0.00004% of overall mudflat habitat.

Although mudflat habitat will be impacted, the result is a trade-off between habitat functions. In an ecosystem context, the benefits of creating salt marsh at the project site can be considered to outweigh the equivalent loss of mudflat because so much former salt marsh in Humboldt Bay has been lost. Furthermore, this project will provide valuable information to guide similar multiple-benefit projects in the future.


Highway 255
Samoa Blvd.
N
Jolly Giant Creek
South I Street
South H Street
South G Street
Butcher's Slough
McDaniel Slough
Salt Marsh
Brackish Pond
Gearheart Marsh
Allen Marsh
Hauser Marsh
Log Pond
Loop 0.63 miles
Stormwater Treatment Marsh
Arcata Marsh Interpretive Center
Arcata Bay
Mt. Trashmore
Boat Ramp
Klopp Lake
No Name Pond
Wastewater Primary Treatment
Old Arcata Wharf
Loop 0.86 miles
To Highway 101 South
Pilot Project Treatment Marshes
Oxidation Pond
Salt Marsh
Oxidation Pond
Oxidation Pond
Loop 0.87 miles
0.17
0.35
0.13
0.09
0.20
0.09
0.12
0.18
0.23
0.31
0.18
0.10
0.13
0.15
0.21
0.26
0.03
0.05
0.08
0.60
0.43
Arcata Marsh & Wildlife Sanctuary
Road
Railroad
Trail
Bird Blinds

Figure 1. Arcata Marsh and Wildlife Sanctuary overview map.

Based on the Biologic Constraints Assessment, no federally listed or state-listed plant species are known to occur in the project area or have the potential to occur in the habitats present in the survey area (H.T. Harvey 2015). Several plants ranked as sensitive by the California Native Plants Society (CNPS) either are present in the survey area or have potential to occur in the survey area.

The existing road and dikes are fortified and not presently experiencing erosion; however, 1.0 meter of sea level rise on Humboldt Bay clearly indicates the existing road at Site 1, and at Sites 2 and 4 and the dike on the east side of the oxidation pond could be overtopped (NHE 2015). The width of the dikes at the base and crown and height (NAVD 88):

- Site 1: Base 60-80'/Top 24-30'/Elevation 11.2' -11.8'
- Site 2: Base 221-230'/Top 24-41'/Elevation 9.4 – 11.5'
- Site 3: Base 40 – 48'/Top 13.1 – 13.5'/Elevation 13.1 – 13.5'
- Site 4: Base 71 – 137'/Top 24 – 94'/Elevation 11 – 13.5'

Approvals Required

- CEQA Notice of Determination.
- City of Arcata Conditional Use Permit.
- Humboldt Bay Harbor, Recreation and Conservation District Shoreline Development Permit.
- California Coastal Commission Coastal Development Permit.
- North Coast Regional Water Quality Control Board Water Quality Certification.
- U.S. Army Corps of Engineers Nationwide Permit #54 for Living Shorelines.

Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

❑ Aesthetics	❑ Agricultural Resources	❑ Air Quality
☒ Biological Resources	☒ Cultural Resources	❑ Geology/Soils
❑ Green House Gas Emissions Quality	☒ Hazards/Hazardous Materials	❑ Hydrology/Water
❑ Land Use/Planning	❑ Mineral Resources	☒ Noise
❑ Population/Housing	❑ Public Services	❑ Recreation
❑ Transportation/Traffic Systems	❑ Tribal Cultural Resources	❑Utilities/Service

☒ Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

- ❑ I find that the proposed project **could not** have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.
- ☑ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. 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 those 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.

_____ _____

Date

Mark Andre/Director Environmental Services

Checklist and Evaluation of Environmental Impacts

An explanation for all checklist responses is included, and all answers consider the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts. The explanation of each issue identifies (a) the significance criteria or threshold, if any, used to evaluate each question; and (b) the mitigation measure identified, if any, to reduce the impact to less than significant. In the checklist below for each question there are four possible answers:

"**Potentially Significant Impact**" means there is substantial evidence that an effect may be significant.

"**Less than Significant with Mitigation Incorporated**" means the incorporation of one or more mitigation measures can reduce the effect from potentially significant to a less than significant level.

"**Less Than Significant Impact"** means that the effect is less than significant and no mitigation is necessary to reduce the impact to a lesser level.

"**No Impact**" means that the effect does not apply to the proposed project, or clearly will not impact nor be impacted by the project.

Summary of Recommended Mitigation Measures

Below is a list of mitigation measures that are identified in the following checklist and would be recommended as conditions of project approval.

1. Aesthetics

The project will have less than a significant impact on aesthetic resources, and mitigation measures are therefore not required.

2. Agricultural and Forestry Resources

The project will have no impact on agricultural and forestry resources, and mitigation measures are therefore not required.

3. Air Quality

The project will have less than a significant impact on air quality resources, and mitigation measures are therefore not required.

4. Biological Resources

4.1 Prior to implementation, the City will survey the shoreline adjacent to each pilot project site to determine if special status plant species are present. If present, the City will avoid populations of these species to the extent possible. Populations that would be unavoidably impacted will be transplanted to suitable locations adjacent to the site prior to construction.

4.2 For areas with suitable eel grass habitat elevations, the City will conduct a pre-construction eelgrass survey in the vicinity of each pilot project site during the active growing season for eelgrass (May through September) that complies with the 2014 NOAA California Eelgrass Mitigation Policy and Implementing Guidelines**.** If pre-construction eelgrass surveys indicate eelgrass will be impacted by the pilot project sites, the City will replace the eelgrass in a similar suitable location on a 1:1 basis.

5. Cultural Resources

5.1 If potential archaeological or paleontological resources are encountered during project subsurface construction activities or geotechnical testing, all work within 50 ft of the find shall be stopped, and a qualified archaeologist shall be contacted to evaluate the find, determine its significance, and identify any required mitigation. The applicant shall be responsible for implementing the mitigation prior to construction activities being re-started at the discovery site.

5.2 If project related geotechnical excavations become necessary, as a result of final design, and those excavations are to be more than one ft deep, then the THPOs of each local native American tribe, will be contacted and given the date and time of excavations so that a cultural monitor may be present to observe for the presence of buried archaeological materials.

6. Geology and Soils

The project will have less than a significant impact on geology and soil resources, and mitigation measures are therefore not required.

7. Greenhouse Gas Emissions

The project will have no impact on greenhouse gas emissions, and mitigation measures are therefore not required.

8. Hazards and Hazardous Materials

8.1 Fueling and maintenance of equipment shall be conducted off-site, or in designated staging areas that are no closer than 150 ft from open water or in any location where hazardous material spills could become entrained in flowing water.

8.2 Prior to the onset of work the contractor shall prepare a plan for the prompt and effective response to any accidental spills.

9. Hydrology and Water Quality

The project will have a less than significant impact on hydrology and water quality and mitigation measures are therefore not required.

10. Land Use and Planning

The project will have no impact on land use and mitigation measures are therefore not required.

11. Mineral Resources

The project will have no impact on mineral resources, and mitigation measures are therefore not required.

12 Noise

12.1 Restrict noise from construction to daytime hours. Hours of construction for outdoor activities exceeding 50 dBA shall be limited to Monday through Friday 8:00 a.m. to 7:00 p.m. on Saturdays from 9:00 a.m. to 700 p.m. Consistent with the City's Noise regulations, no heavy equipment related construction activities shall be allowed on Sundays or holidays. Movement and hauling of material, and associated activities such as re-fueling or maintenance, shall be limited to normal working hours for the area, as specified above. More restrictive operation hours may be specified in the construction documents and may be property-specific.

12.2 If necessary, limit public access to adjacent trails within the Arcata Marsh and Wildlife Sanctuary during construction to avoid exposing people to noise levels higher than standards established in the local general plan, or applicable standards of other agencies.

13. Population and Housing

The project will have no impact on population and housing, and mitigation measures are therefore not required.

14. Public Services

The project will have no impact on public services, and mitigation measures are therefore not required.

15. Recreation

The project will have no impact on recreation, and mitigation measures are therefore not required.

16. Transportation and Traffic

The project will have no impact on transportation and traffic, and mitigation measures are therefore not required.

17. Tribal Cultural Resources

The project will have no impact on tribal cultural resources, and mitigation measures are therefore not required.

18. Utilities and Service Systems

The project will have no impact on utilities and service systems, and mitigation measures are therefore not required.

19. Mandatory Findings of Significance

The project will have no additional findings of significance, and mitigation measures beyond those already stated in previous sections are not required.

1. Aesthetics

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?			✓	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?				✓
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			✓	
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?			✓	

a) Would the project have a substantial adverse effect on a scenic vista?

Thresholds of Significance

Long-term intrusion or alteration of a scenic vista that is visible to the public.

Assessment

The project will have a less than significant impact on a scenic vista. The pilot projects will be visible to the recreating public that uses trails adjacent to the project sites during low tides. Construction impacts will be temporary and short term. As the living shoreline pilot sites accrete sediments and transition to salt marsh, the structures will become less visible and will naturally revegetate.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?

Thresholds of Significance

Permanent adverse change within a State scenic highway to scenic resources' physical, vegetative, or aesthetic elements visible to the public.

Assessment

The project will have no impact. The project is not within the viewshed of a State scenic highway.

c) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

Thresholds of Significance

Long-term alteration or degradation of the existing visible character and quality of a site and its surroundings, which is visible to the public.

Assessment

The project's short-term effects during construction, are less than significant on the existing visible character and quality of the site and its surroundings.

Given the project's context within the larger AMWS, it will have no long-term impacts.

d) Would the project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?

Thresholds of Significance

Long-term or permanent development that would create a new source of substantial light or glare.

Assessment

The project will have no impact. The project does not include any elements or new uses that will include new sources or light or glare.

2. Agriculture 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 Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. **Would the project:**	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				✓
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				✓
c) Conflict with existing zoning for, or cause rezoning of, forest land or timberland?				✓
d) Result in the loss of forest land or conversion of forest land to non-forest use?				✓
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				✓

a) Would the project 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?

Thresholds of Significance

Physical changes that prevent the use of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses.

Assessment

There is no project impact. The project is not located in or near lands uses for farmland purposes. The project is not zoned for agricultural uses. The project is located in a natural resource protection zone and is composed of mudflats adjacent to the AMWS. This area is not classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

Thresholds of Significance

Implement land uses that are not allowed and conflict with existing zoning for agricultural use, or a Williamson Act contract.

Assessment

There is no project impact. Existing zoning is not compatible for agriculture use and the property is not bound by a Williamson Act contract.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in PRC Section 12220(g)) or timberland (as defined in PRC Section 4526)?

Thresholds of Significance

Implement land uses that are not allowed and conflict with forest or timber land uses or zoning.

Assessment

There is no project impact. The existing land use (Natural Resource Protection) is not managed for forest purposes. The project is located in bay mud flats and will not impact existing or future forest lands in any way.

d) Would the project result in the loss of forest land or conversion of forest land to non-forest use?

Thresholds of Significance

Physical changes that would result in the loss of forest land or conversions of forest land to non-forest uses.

Assessment

There is no project impact. The project area is not forest land and will not result in the conversion of forest land to non-forest land.

e) Would the project 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?

Thresholds of Significance

Physical changes which could convert adjacent farmlands to non-agricultural use or convert adjacent forest lands to non-forest use.

Assessment

There is no project impact. The project area is not used as farmland or forestland and is not used for agricultural or forest uses. There will be no conversion of use on this property or impacts to adjacent properties that would impact farmland or forestland, or any other use.

3. Air Quality

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. **Would the project:**	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?			✓	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?				✓
c) 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 (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?				✓
d) Expose sensitive receptors to substantial pollutant concentrations?			✓	
e) Create objectionable odors affecting a substantial number of people?				✓

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

Thresholds of Significance

Project generates pollutants that would prevent attainment of the North Coast Unified Air Quality Management District's (NCUAQMD) long-term air quality objectives.

Assessment

The project will have a less than significant impact on the implementation of the NCUAQMD air quality plan.

The project site is located within the North Coast Air Basin (NCAB), which is under the jurisdiction of the NCUAQMD. The NCAB currently meets all federal air quality standards; however, the entire air basin is currently designated as non-attainment for the state 24-hour and annual average particulate matter smaller than 10 microns in size (PM10) standards. The air basin is designated as unclassified for the state annual PM2.5 standard. Both natural and anthropogenic sources of particulate matter (including vehicle emissions, wind generated dust, construction dust, wildfire and human caused wood smoke, and sea salts) in the NCAB have led to the PM10 non-attainment designation.

To address non-attainment for PM10, the NCUAQMD adopted a Particulate Matter Attainment Plan in 1995. This plan presents available information about the nature and causes of PM10 standard exceedances and identifies cost-effective control measures to reduce PM10 emissions to levels necessary to meet California Ambient Air Quality Standards. These rules and regulations are set forth to achieve, maintain, and protect health-based State and Federal Ambient Air Quality Standards and prevent deterioration of levels of air quality which may jeopardize human health and safety; prevent injury to plant and animal life; avoid damage to property; and preserve the comfort, convenience, and enjoyment of the natural attractions of the NCAB.

Pursuant to Air Quality Regulation 1, Chapter IV, Rule 400 – General Limitations, a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property. Visible emissions include emissions that are visible to the naked eye, such as smoke from a fire.

The project's construction activities are of limited scope and duration and do not involve any stationary sources of pollutants. During construction, the operation of dump trucks will generate pollutants in the short-term such as fugitive dust (particulate matter less than 10 microns [PM10]). While the short-term operation of vehicles and diesel powered construction equipment does release PM 10 and nitrogen oxides (NOx) pollutants, these releases are not expected to result in a substantial adverse effect as all equipment will be equipped with state approved exhaust systems, and maintained in good working order.

To summarize, the project would not directly contribute any air emissions once the project is in full operation. The project would temporarily generate a minor amount of particulate emissions over the duration of construction in the form of dust and vehicle emissions from dump trucks, likely from a single day of use only.

The project would not cause any long-term increase in the emissions of particulate matter or other air pollutants. To further reduce potential impacts to air quality to a level below the thresholds of significance, state law requires the construction contractor to operate in accordance with Air Quality Regulation 1 – Air Quality Control Rules, which will reduce potential fugitive dust emission impacts.

The project will not result in adverse air quality impacts including exceeding or violating an air quality plan. Based on the conclusions above and adherence to the NCUAQMD's rules and regulations, the project will not result in any significant adverse air quality impacts; therefore, impacts will be less than significant.

b) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Thresholds of Significance

Release of pollutants that violate an air quality standard, or substantially contribute to an existing air quality violation

Assessment

The project will have no impact. Heavy equipment to be used for the project include using a dump truck to unload 700 cubic yards of large rock at one pilot project site only, which will be limited to a brief period of work (two to three weeks). All other aspects of the project involve hand work only and will not generate pollutants that violate air quality standards.

c) Would the project 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 (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?

Thresholds of Significance

Production of pollutants by the project that would result in a cumulatively considerable net increase in pollutants for which the NCUAQMD is in non-attainment.

Assessment

The project will have no impact.

The project involves a relatively low level of construction activity, limited in scope and duration, with respect to air quality, and the net increase to PM10 will be minor and temporary. These ordinary construction emissions will not result in violations or attainment plan conflicts.

d) Would the project expose sensitive receptors to substantial pollutant concentrations?

Thresholds of Significance

The project would result in a substantial increase of pollutants that are capable of reaching sensitive receptors.

Assessment

The project will have a less than significant impact.

Sensitive receptors include school-aged children (schools, daycare, playgrounds), the elderly (retirement community, nursing homes), the infirm (medical facilities/offices), and those who exercise outdoors regularly (public and private exercise facilities, parks). The nearest receptor to the project are the trails located within the Arcata Marsh, especially those adjacent to the project sites. Because the project will generate a very minimal amount of pollutants (use of a dump truck for a single day), exposure to sensitive receptors is minimal and will be less than significant.

e) Would the project create objectionable odors affecting a substantial number of people?

Thresholds of Significance

The project would result in a substantial increase of objectionable odors that are capable of reaching substantial number of people.

Assessment

The project will have no impact. The project will not create objectionable odors that will affect a substantial number of people.

4. Biological Resources

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		✓		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			✓	
c) Have a substantial adverse effect on Federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			✓	
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				✓
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				✓
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?				✓

a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Thresholds of Significance

Direct impacts on individuals of any protected species or species of concern or substantial adverse impacts to their habitat functions or values.

Assessment

The project will have a less than significant impact, with the successful implementation of mitigation measures. The complete list of special status species identified during a CNDDB Rare Fine 5 and CNPS query records for the Arcata South USGS 7.5- minute quadrangle is available in Appendix C.

Fisheries

Project implementation will occur during low tide when fish species are not present and thus will not be directly impacted by construction activities. There may be a short-term increase in turbidity during the first high tide following construction, as disturbed sediments are mobilized by tidal waters for the first time. Since all construction will be done on foot only and heavy equipment will not enter the mudflats, soil disturbance and thus short term increases in turbidity are expected to be minimal and limited in duration.

Over the long term, the increase in salt marsh resulting from project implementation will provide higher value habitat for fisheries resources.

Plants

An evaluation of biotic constraints was conducted to summarize potential biotic constraints to the project (H.T. Harvey 2015). Protocol-level field surveys for wildlife and rare plant species were not conducted. Intertidal mudflats occupy nearly all the proposed pilot project sites. Subtidal slough channels bisect the mudflats. Salt marsh occurs sporadically as a narrow fringe on the sides and toe of the existing dikes. Ruderal vegetation, associated with human disturbance and characterized by weedy plants, borders the trails on the crowns of the dikes. Although not a sensitive habitat type, ruderal vegetation could support special-status plant species (described below), and potential impacts on these species have been considered (H.T. Harvey 2015).

Federally and state-listed plant species are not known to occur along the shoreline of the AMWS, as noted by H.T. Harvey (2015). Additionally, several plants ranked as sensitive by the California Native Plant Society (NPS) are present or have the potential to occur (H.T. Harvey 2015). Special status species with the potential to occur at the pilot project sites include:

- Point Reyes Bird's Beak (*Chloropyron maritimum ssp. Palustre),*
- Humboldt Bay Owl's Clover (*Castilleja ambigua ssp. humboldtiensis),*
- Western Sand Spurrey (*Spergularia canadensis var. occidentalis),*
- Lyngbye's Sedge (*Carex lyngbyei),*
- Seacoast Angelica (*Angelica lucida*), and
- Maple-Leaved Checkerbloom ((*Sidalcea malachroides*).

Impacts to these species will be avoided through the implementation of **Mitigation Measure 4.1**

Eelgrass

While eelgrass has been observed along the AMWS shoreline near pilot sites (H.T. Harvey 2015), it has not been observed at the location of the pilot sites. While implementing work at the pilot sites, turbidity will be minimized to the greatest extent possible to minimize potential impacts to eelgrass growing outside of the pilot site footprints but within range of water quality effects (see Section 9 Hydrology and Water Quality). With the incorporation of **Mitigation Measure 4.2**, impacts to eelgrass will be avoided.

Birds

The California Brown Pelican (*Pelecanus occidentalis californicus*) is a State Fully Protected Species and has been reported to roost near the project area at Klopp Lake (USFWS 2007, cited by H.T. Harvey 2015), which receives frequent use by recreators and their dogs on the adjacent surrounding trail.

The California brown pelican, a subspecies of the brown pelican (*P. occidentalis*), ranges widely along the West Coast of the United States. The brown pelican (entire species) was federally listed as endangered, and the California subspecies was listed as endangered by the State of California because of widespread reproductive failures linked to environmental contaminants such as DDT. It was delisted by California and the federal government in 2009; however, the subspecies remains fully protected by the State of California (H.T. Harvey 2015).

California brown pelicans feed in estuaries and nearshore ocean waters such as those found near the AMWS. They also plunge-dive to capture small schooling fishes near the water's surface (H.T. Harvey 2015). Communal roosting occurs year-round as pelicans move up and down the coast; this roosting appears to have several important functions, such as predator detection and avoidance, assistance with finding prey, and socialization (Jaques et al. 2008, H.T. Harvey 2008). Pelicans roost on sandbars, pilings, jetties, dikes, breakwaters, and offshore rocks, sometimes in large communal roosts that can number in the thousands (H.T. Harvey 2015).

Pelican roosting has been reported at oyster rafts, islands, jetties, mudflats, and artificial structures throughout Humboldt Bay (Jaques et al. 2008, cited by H.T. Harvey 2015). They are most abundant in Humboldt Bay from summer through midfall (Nelson 1989, cited by H.T. Harvey 2015). However, the number of people and dogs that utilize the AMWS dike trail system, generally precludes the use of these dikes for roosting.

Once construction is complete, unvegetated areas of the pilot project sites, especially the site using large rock armoring, will provide additional roosting habitat for the pelicans.

Intertidal mudflats near the project area provide important foraging habitat for shorebirds during the nonbreeding season (H.T. Harvey 2015). Common species in Humboldt Bay include dunlin (*Calidris alpina*), least sandpiper (*Calidris munutilla*), western sandpiper (*Calidris mauri*), marbled godwit (*Limosa fedoa*), black-bellied plover (*Pluvalis squatarola*), semipalmated plover (*Charadrius semipalmatus*), American avocet (*Recurvirostra americana*), and willet (*Tringa semipalmata*) (Danufsky and Colwell 2003, cited by H.T. Harvey 2015). Pilot sites will convert mudflats to salt marsh; however, the total cumulative area of conversion is small (0.45 acres) and thus is not expected to significantly impact shorebird species foraging within or near the pilot site locations. Additionally, salt marsh is a more desirable habitat than mudflats on Humboldt Bay and is significantly more limited than mudflat availability in Humboldt Bay overall, as well as near the AMWS.

Although no vegetation removal is proposed, if construction occurs during the avian nesting season, a pre-construction survey will be conducted within seven days prior to construction to ensure that there are no nesting birds within 100 feet of construction. If the survey finds species to be nesting, nests will be flagged and avoided until all young have fledged.

Other Wildlife Species

An evaluation of biotic constraints was conducted to summarize potential wildlife constraints to the project; protocol-level field surveys for wildlife and rare plant species were not conducted (H.T. Harvey 2015). Through this effort, Northern red-legged frogs (*Rana aurora aurora*) (species of special concern) are known to be present in and around freshwater habitats of the AMWS, outside the project construction area (H.T. Harvey 2015). Potential impacts to red-legged frogs are possible but unlikely, limited to potential affects from vehicles traveling to the construction zone. Potential impacts to red-legged frogs are expected to be less than significant.

Mitigation Measures

4.1 Prior to implementation, the City will conduct seasonally appropriate surveys of the shoreline adjacent to each pilot project site to determine if special status plant species are present. If present, the City will avoid populations of these species to the extent possible. Populations that would be unavoidably impacted will be transplanted to suitable locations adjacent to the site prior to construction.

4.2 For areas with suitable eelgrass habitat elevations, the City will conduct a pre-construction eelgrass survey at the location of pilot project sites during the active growing season for eelgrass (May through September) that complies with the 2014 NOAA California Eelgrass Mitigation Policy and Implementing Guidelines**.** If pre-construction eelgrass surveys indicate eelgrass will be impacted by the pilot project sites, the City will replace the eelgrass in a similar suitable location on a 1:1 basis.

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

Thresholds of Significance

A net reduction in area or ecological functions or values in riparian habitat or other sensitive natural communities.

Assessment

Impacts to riparian habitat will be less than significant.

The pilot projects are located at elevations that are fully tidal and thus do not constitute riparian habitat. Some of the armored shoreline adjacent to the pilot project sites may be partially vegetated but do not constitute riparian habitat. Log placement will occur in tidal environments where riparian habitat is not present. Impacts to any salt marsh vegetation if present will be limited and short term in duration. Over time, the pilot sites will revegetate via willow wattles and will provide additional vegetative habitat than currently present.

c) Would the project have a substantial adverse effect on Federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Thresholds of Significance

Adversely affect wetlands or waters of the state and U.S., resulting in a net reduction of area, functions, or values.

Assessment

There will be a less than significant impact.

The project is in the Coastal Zone and Chapter 3 Section 30121 of the Coastal Act defines wetlands as “lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens. The Coastal Commission regulations utilize a “one parameter” definition/evidence for wetland determinations.

> *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 and 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 Section 13577).*

The project will convert 0.78 acres of mudflats to salt marsh, which is a much more limited wetland type on Humboldt Bay. Historically, Humboldt Bay occupied approximately 25,800 acres: 15,300 acres (59%) of open water, tidal channels, and mud flats, and 10,500 acres (41%) inter-tidal wetlands (salt marsh and tidal channels) (USSG Township Plats 1854). Today, Humboldt Bay occupies approximately just 20,462 acres: open water and mud flats cover approximately 18,900 acres (92.5%), and salt marsh covering approximately 1,550 acres (7.5%) (NOAA 2009 Imagery). Since 1854, the proportion of salt marsh on Humboldt Bay has become drastically reduced, and this Environmentally Sensitive Habitat Area (ESHA) is considered a high priority for restoration on Humboldt Bay, compared to mudflat ESHA.

The project will not result in any loss of wetland area. Additionally, the additional salt marsh anticipated to accrete in place will increase overall wetland function.

d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Thresholds of Significance

Long-term disruption of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. This includes physical alterations to topography, hydrology or vegetation that fragment contiguous habitat areas.

Assessment

The project will have no impact. All project construction activities will occur during low tides only and will not affect the movement of any fish or wildlife species during or after construction.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Thresholds of Significance

Conflict with a local policy or ordinance to protect biological resources.

Assessment

The project will have no impact.

The project does not conflict with any of the City of Arcata's policies or ordinances protecting biological resources. The project is fully supported by the City of Arcata's policies and ordinances in support of biological resources and sea level rise resiliency. City of Arcata policies and ordinances consistent with the proposed project include:

- *9.28.100 - Wetland Protection (:WP) and Stream Protection (:SP) Combining Zones*

A. Purpose. The :WP combining zone is applied to sites and areas with or adjacent to wetlands. The :SP combining zone is applied to sites and areas with or adjacent to streams and tidelands. Both of the combining zones are intended to protect these significant environmental resources from destruction and degradation, and to retain and enhance the resources as valuable natural, scenic, and recreational amenities as appropriate.

B. Applicability. The :WP and :SP combining zones are applied to property in compliance with the provisions of Chapter 9.59 (Environmentally Sensitive Habitat Area Protection and Preservation), and may be combined with any primary zoning district established by Section 9.12.020 (Zoning Map and Zoning Districts).

C. Land use and development standards. Proposed development and new land uses within the :WP and :SP combining zones shall comply with the requirements of Chapter 9.59 (Environmentally Sensitive Habitat Area Protection and Preservation), the primary zoning district, and all other applicable provisions of this Land Use Code.

- *Municipal Code Chapter 9.59: Environmentally Sensitive Habitat Areas Protection and Preservation*

Environmentally sensitive habitat areas (ESHA) (Arcata Bay, tidal sloughs, estuaries, creeks, ponds, salt marshes, riparian corridors, wetlands, bird rookeries, shorebird concentration sites, Arcata Marsh and Wildlife Sanctuary, and diked/reclaimed former tidelands-Public Trust Lands) within the City are important natural resources that provide ecological balance, ecosystem function, biological productivity, and values such as wildlife habitat, water quality, open space and scenic resources, flood control , and opportunities for scientific study and education. Therefore, the requirements of this Chapter are intended to:

A. Protect the structure, composition, function and natural processes of ESHA to the same extent as occurs in the least-disturbed natural ecosystems in the City's Planning Area;

B. Provide standards for development that will incorporate ESHA into the site design of proposed development without significant adverse impacts to these resources;

C. Ensure that any proposed subdivision, land use or development adjacent (within 250 feet) to or capable of affecting ESHA will not degrade these resources or diminish their structure, composition, function and natural processes; and

D. Ensure that legally created lots in ESHA contain a building site with minimum reduction necessary to the ESHA.

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?

Thresholds of Significance

Obstruct or prevent the recovery of any listed species covered in an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan

Assessment

The project will have no impact.

There is not an adopted Habitat Conservation Plan or Natural Community Conservation Plan for the project area. The City of Arcata does not have an existing management plan for the Arcata Marsh and Wildlife Sanctuary; however, the proposed project is compliant with overarching City policies related to natural resources, wetlands, and wetland restoration within the City's Land Use Code, including policies for NRP zoned area.

5. Cultural Resources

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				✓
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		✓		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		✓		
d) Disturb any human remains, including those interred outside of formal cemeteries?				✓

a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?

Thresholds of Significance

Result in physical changes in the significance of a historical or cultural resource as defined in CEQA Guidelines Section 15064.5.

Assessment

There will be no significant impact. There are is only one historic structure near proposed pilot project sites 3 and 4, on the southern edge of the oxidation ponds. The Jacoby Creek railroad grade consist of rock revetment and wooden pilings. The project activities will not disturb the revetment of wooden pilings. The project also does not involve excavation. Other cultural resources are not likely to be located in tidal mudflats and submerged areas of Humboldt Bay.

Several previously documented historic railroad lines are located near project site 1, including the Arcata Extension and the Harpst and Spring Tramway (Roscoe & Associates 2010). The proposed living shoreline pilot project will not impact remains of either historic railroad lines. Roscoe and Associates (2010) found that the historic railroad and dike features lacked integrity and did not appear to meet any of the criteria for listing in the National Register of Historic Places, nor did they appear to be historical resources for the purposes of CEQA.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Thresholds of Significance

Result in physical changes in the significance of an archaeological resource defined in CEQA Guidelines Section 15064.5

Assessment

There will be no significant impact with the incorporation of **Mitigation Measures 5.1 and 5.2.** The project does not involve excavation. Archaeological resources are not likely to be located in the mud flats.

Mitigation Measures

5.1 If potential archaeological or paleontological resources are encountered during project subsurface construction activities or geotechnical testing, all work within 50 ft of the find shall be stopped, and a qualified archaeologist shall be contacted to evaluate the find, determine its significance, and identify any required mitigation. The applicant shall be responsible for implementing the mitigation prior to construction activities being re-started at the discovery site.

5.2 If project related geotechnical excavations become necessary, as a result of final design, and those excavations are to be more than one ft deep, then the THPOs of each local native American tribe, will be contacted and given the date and time of excavations so that a cultural monitor may be present to observe for the presence of buried archaeological materials.

c) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Thresholds of Significance

Result in physical changes or destruction of a unique paleontological resource or site or unique geologic feature.

Assessment

There will be no significant impact with the implementation of **Mitigation Measures 5.1 and 5.2** described in section 5b. The project does not involve excavation. Paleontological resources are not likely to be located in the mud flats.

d) Would the project disturb any human remains, including those interred outside of formal cemeteries?

Thresholds of Significance

Disturbance of human remains.

Assessment

There will be no impact. The project does not involve excavation.

6. Geology and Soils

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) 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.				✓
ii) Strong seismic ground shaking?				✓
iii) Seismic-related ground failure, including liquefaction?				✓
iv) Landslides?				✓
b) Result in substantial soil erosion or the loss of topsoil?			✓	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			✓	
d) Be located on expansive soil, as defined by the California Building Code (2007), creating substantial risks to life or property?				✓
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				✓

a) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

I. **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**)**

II. **Strong seismic ground shaking?**

III. **Seismic-related ground failure, including liquefaction?**

IV. **Landslides?**

Thresholds of Significance

Project is located in a known active earthquake fault zone.

Assessment

There will be no impact.

The project is not located in an active earthquake fault zone (Alquist Priolo) or in a landslide hazard zone. Alquist-Priolo Earthquake Fault Zones are mapped in the Division of Mines and Geology Special Publication 42. The California Department of Conservation shares Probabilistic Seismic Hazard Maps are used to determine seismic shaking hazards. The North Coast map indicates the project area is vulnerable to the highest level of earthquake hazard.

The California Department of Conservation has maps intended to assist local governments through their Seismic Hazard Zonation Program. Available data for the project area in the USGS Arcata South indicate the nearest mapped fault runs through downtown Arcata, north of the project area, as described by the California Division of Mines and Geology (1982).

The proposed project will not result in additional use of the Arcata Marsh and Wildlife Sanctuary and will thus not expose users to earth quake hazards above existing levels. The proposed project also does not include construction of a structure or other infrastructure that would create additional earthquake hazards. The project area does not have the potential for landslides.

b) Would the project result in substantial soil erosion or the loss of topsoil?

Thresholds of Significance

Substantial acceleration of the rate of soil erosion at the project site or the loss of top soil.

Assessment

The impact will be less than significant.

The proposed project will not result in soil erosion. The goal of the proposed project is to accrete sediments from Humboldt Bay in place to create and enhance salt marsh as a green technology to mitigate anticipated impacts from sea level rise.

The project does include a minimal amount of hand digging in the mud flat zone in order to place and install the sea level rise mitigation structures. The associated erosion of mud flats will be limited. Temporary erosion or loss is not expected to be significant.

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

Thresholds of Significance

Substantially de-stabilize an otherwise stable soil or geologic unit.

Assessment

The project will have no impact on stability of the underlying soil, nor have any potential to initiate landslides, lateral spreading, subsidence, liquefaction or collapse. The project is located on both existing and diked former tidelands. The project area is relatively flat. There are no historic landslides are in the project area and there are no occurrences of liquefaction. The proposed project will not create situations that could cause the underlying geologic material to become any more unstable than it is inherently; any project impacts would be less than significant.

d) Would the project be located on expansive soil, as defined by the California Building Code (2007), creating substantial risks to life or property?

Thresholds of Significance

Located on expansive soils.

Assessment

There will be no impact.

The Project will have no impact. The project is not located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994).

The project is located on Bayside loam soil, located in a transitional setting between floodplains and tidal salt marsh. The project is not located on expansive soils; therefore, no project impact is expected to life or property.

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

Thresholds of Significance

Located on underlying soils that are not capable of adequately filtering wastewater or alternative waste water disposal systems.

Assessment

The Project will have no impact.

The proposed project does not include septic tanks or other alternative wastewater disposal systems, and no impact related to wastewater disposal in soils would result. The project area is served by existing municipal wastewater disposal infrastructure. No project impact is expected.

7. Greenhouse Gas Emissions

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

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Thresholds of Significance

Substantial generation of GHG emissions due to project implementation.

Assessment

There will be no impact.

The City of Arcata does have a Community Greenhouse Gas Reduction Plan (2006), and this project does not conflict with this plan. The project will involve limited use of a dump truck to deliver large rock to the project site. An excavator will also be used to place the large rock at the project site approximately two to three weeks or less. All other actions to implement this project will be conducted using hand labor and will not generate GHG. The project is not expected to generate a substantial amount of GHG emissions.

Additionally, the project will be creating new salt marsh in Humboldt Bay, which will help mitigate GHG over the long term. The long-term effect of the project on carbon sequestration in the project area was evaluated by comparing the estimated carbon flux in existing and post-project land cover types. A recent summary of existing data (Philip Williams and Associates 2009) suggests that freshwater wetlands, riparian forest, brackish wetlands, and salt marsh all have high rates of carbon sequestration. However, wetlands also produce methane, which is a potent GHG, during anaerobic decomposition in low-salinity, saturated soils. Methods for measuring carbon sequestration and methane production in wetlands are just becoming standardized.

Carbon budgets of this range of habitats may vary based on site specific conditions; however, the following relationships give us an estimate of the effect of this restoration on GHG emissions. The carbon sequestration benefit of freshwater wetlands is offset by their production of methane. Seasonal wetlands and riparian habitat produce less methane than perennial freshwater wetlands as they dry out during summer when methane production in saturated soils is greatest, due to anoxic conditions (Philip Williams and Associates 2009). While mudflats produce little methane, they also sequester little carbon. Therefore, restoring tidal salt marsh wetlands is an effective means to sequester carbon while reducing methane emissions.

b) Would the project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

Thresholds of Significance

Project results in a cumulatively considerable net increase in GHG emissions for which California pursuant to Assembly Bill (AB) 32 desires to reduce California's GHG emissions to 1990 levels by 2020.

Assessment

There will be no impact.

The project will involve short-term use of heavy equipment and will not result in a net increase in GHG emissions. The project is not expected to result in any considerable net increase in GHG emissions. Over the long-term, the salt marsh will help mitigate reduce GHG impacts.

The Project will have a less than significant impact with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

The City has an adopted a Community Greenhouse Gas Reduction Plan, which was developed prior to goals established by AB 32 GHG emissions reductions. The City's plan established a goal of reducing GHG emissions 20% between 2000 and 2010 but does not include GHG emissions targets beyond 2010.

To facilitate an assessment of the project's GHG emissions we have utilized Humboldt County's Draft Climate Action Plan (2012). The County has set a goal of reducing long term annual GHG emissions of the unincorporated County by 31,658 tons. This reduction would meet the goal of AB 32 of reducing GHG emissions to 1990 levels by 2025. Humboldt County's Plan seeks to achieve this reduction primarily by reducing vehicle miles traveled through more compact, higher density urban development.

Project implementation is expected to result in a short-term increase in GHG emissions during construction, and a small long-term net increase in carbon storage (7a). Short-term construction related emissions for project implementation will not interfere with the City's efforts to achieve reductions in GHG emissions by reducing vehicle miles traveled through more compact development. Therefore, the project would not conflict with any plans, policies or regulations aimed at reducing GHG emissions.

8. Hazards and Hazardous Materials

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

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Thresholds of Significance

Storage or use of large quantities of hazardous materials that could be released into the environment.

Assessment

The project will have a less than significant impact, as it does not involve storage or use of large quantities of hazardous materials.

Project construction would require the use of hazardous materials such as fuels, lubricants, and solvents. Following construction, the project would not require use, storage, or transport of hazardous materials. The project's use of heavy equipment and vehicles contains a potential risk of an accidental release of small quantities of fuel, oil and coolant, however standard construction protocol ensures that no large quantities of hazardous materials will be released into the environment should any spills occur. This includes but is not limited to regular inspections to ensure heavy equipment is in good condition and no leaks are present; spill clean-up kits kept on-site; and equipment operators are trained in spill response procedures.

b) Would the project 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?

Thresholds of Significance

Project involves the use of large quantities of hazardous materials.

Assessment

Less than significant impact with the successful implementation of mitigation measures discussed in Section 8 (a) and **Mitigation Measures 8.1-8.2**

The project has a low potential for 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.

Mitigation Measures

8.1 Fueling and maintenance of equipment shall be conducted off-site, or in designated staging areas that are no closer than 150 ft from open water or in any location where hazardous material spills could become entrained in flowing water.

8.2 Prior to the onset of work the contractor shall prepare a plan for the prompt and effective response to any accidental spills.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Thresholds of Significance

Project is located within one-quarter of mile of a school and involves the use of large quantities of hazardous materials.

Assessment

The project will have no impact.

There are no schools located within 1/4 mile of the project site. The closest school is the Union Street Elementary School slightly over a mile northeast of the project site. The project will not emit hazardous materials within ¼ mile of the school. The project does not involve the use of large quantities of hazardous materials.

d) Would the project be located on a site which is included on a list of hazardous materials sites complied pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Thresholds of Significance

The project is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

Assessment

The project will have no impact.

The project is not located on a site which is included on a list of hazardous materials.

However, testing of sediments at a former industrial site on Butcher Slough upstream from proposed project pilot site 3 found dioxin. Proposed project activities are not expected to mobilize sediments or dioxin, if present in the mudflats to a significant level. Project activities do not involve equipment in mudflat areas and are analogous to the effects of people walking on mudflats conducting research or getting stuck in a kayak.

e) If applicable, would the project be 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 for people residing or working in the project area?

Thresholds of Significance

Project is 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.

Assessment

The project will have no impact.

The project is not located within two miles of a public airport.

f) If applicable, would the project be located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Thresholds of Significance

Project is located within the vicinity of a private airstrip.

Assessment

The project will have no impact.

The project is not located within the vicinity of a private airport.

g) Would the project impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Thresholds of Significance

Project would prevent alerting and warning citizens, conducting evacuations, short-term feeding and sheltering, conducting search and rescue operations or using emergency evacuation routes.

Assessment

The project will have no impact.

The proposed project will not interfere with an adapted emergency response or evacuation plan.

h) Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized area or where residences are intermixed with wildlands?

Thresholds of Significance

Project is located in an area shown on a map used to identify wildland fire hazard areas. Potential exists for a significant risk of loss, injury or death involving wildland fires.

Assessment

The project will have no impact.

The project is currently located in an area of low fire rating. The project area is mostly flat topography that will become predominately inter-tidal wetlands that have “nil” fire rating. There are no habitable structures in or near the project area. The project area is bounded by marsh and open water, with very little opportunity for wild fire to spread.

9. Hydrology and Water Quality

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?			✓	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				✓
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off-site?				✓
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				✓
e) 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?				✓
f) Otherwise substantially degrade water quality?				✓
g) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary of Flood Insurance Rate Map or other flood hazard delineation map?				✓
h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?				✓
i) Expose people or structures to a significant risk or loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			✓	
j) Result in inundation by seiche, tsunami, or mudflow?			✓	

a) Would the project violate any water quality standards or waste discharge requirements?

Thresholds of Significance

Exceed any state water quality standards or waste discharge requirements.

Assessment

The project will have a less than significant impact. All project construction activities will occur during low tides when the pilot project sites are naturally dewatered. However, there is a temporary increase in local turbidity expected during the first tidal cycle after construction when the pilot sites become rewatered for the first time. While there will be no heavy equipment operating from the mudflats themselves, a small amount of mudflat surface will be disturbed via hand digging, foot access over milled log plants (boards), and placement of coir logs, large rocks, and large wood. This short-term impact is not expected to be significant. Over the long-term, the salt marsh established by the pilot project sites will provide a benefit to water quality by enhancing wetland function along the AMWS and Humboldt Bay overall.

In addition, the City will complete planning, monitoring, and maintenance tasks specifically requested by the North Coast Regional Water Quality Control Board and the California Coastal Commission, outlined below. Completion of these activities will further reduce potential impacts to hydrology and water quality and include:

- The City will submit a monitoring and maintenance information to the North Coast Regional Water Quality Control Board for their review and approval. This information will include:
    a. A plan to monitor the pilot areas, at a minimum annually, for five years;
    b. An adaptive management plan if the City intends to modify the units any time after construction;
    c. A plan to annually notify the Regional Water Board of monitoring results, with photographs and brief narrative; and
    d. A timeline linked to performance evaluation and contingency remediation. The plan should provide a timeline that will be used to evaluate the areas, determine failure and/or success, and restore the areas to original condition, as appropriate.

- The City will implement best management practices to prevent sedimentation and turbidity resulting from project activities, consistent with the City's Stormwater Management Municipal Code Sections (Title VII, Chapter V, Division II) and Grading and Erosion Control Ordinance (Ordinance No. 1255).

b) Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Thresholds of Significance

Substantially deplete groundwater supplies or interfere with groundwater recharge or lowering of the local groundwater table.

Assessment

The project will have no impact.

The project will not affect groundwater supplies or interfere with groundwater recharge or lower the local groundwater table.

The project is located next to Humboldt Bay and is not near any groundwater wells. If a freshwater aquifer exists at the project site, it does not supply any local water use. The project area does not contribute to any local groundwater supplies. Therefore, the project will have no impact on groundwater supplies.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off-site?

Thresholds of Significance

Substantially alter existing drainage, increasing surface runoff and/or resulting in substantial erosion or siltation on or off site.

Assessment

The project will have no impact. The project is small in size and will not affect existing drainage patterns of the site or area. The project is located in a fully tidal setting. The project will not alter the course of any stream or tidal channel within the AMWS. The project will not result in substantial erosion or siltation on or off-site.

d) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Thresholds of Significance

Increase the volume of surface runoff that potentially could cause localized flooding.

Assessment

The project will have no impact. The goal of the project is to expand the salt marsh surrounding the AMWS, in an effort to mitigate anticipated impacts from sea level rise. On-site flooding is an existing and desirable condition for tidal wetlands.

e) Would the project 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?

Thresholds of Significance

Runoff exceeds the capacity of existing or planned stormwater drainage systems or provides substantial additional sources of polluted runoff.

Assessment

The project will have no impact.

The implementation of the pilot projects will not affect the volume of stormwater runoff and will therefore not add any source of polluted runoff in the project area.

f) Would the project otherwise substantially degrade water quality?

Thresholds of Significance

Exceed any state water quality standards not previously assessed in 9 (a).

Assessment

The project will have no impact. The short-term turbidity effects anticipated after installing the project are discussed in 9 (a) above. No additional exceedances to water quality standards are expected to occur.

g) Would the project place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary of Flood Insurance Rate Map or other flood hazard delineation map?

Thresholds of Significance

Placing housing within the 100-year flood plain, or other area subject to flooding.

Assessment

The project will have no impact. The project does not involve housing.

h) Would the project place structures within a 100-year flood hazard area structures, which would impede or redirect flood flows?

Thresholds of Significance

Construction of structures in the 100-year flood hazard area which would impede or redirect flood flows.

Assessment

The project will have no impact.

The project will not construct structures that would impede or redirect flood flows. The project is in FEMA's designated 100-year floodplain, with a Special Flood Hazard Area with high flood risk. The project does not include structures that could impede or redirect flood flows.

It is possible the structures themselves could become mobile during a significant flooding event. In order to avoid the structures themselves becoming a hazard, the use of uncapped rebar or other metal implements that could pose a threat to navigation in Humboldt Bay will be strictly avoided.

i) Would the project expose people or structures to a significant risk or loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Thresholds of Significance

Project is located in a flood hazard area exposing people or structures to risk of loss, injury or death involving flooding.

Assessment

The project will have a less than significant impact.

The project is in FEMA's designated 100-year floodplain, with a Special Flood Hazard Area with high flood risk. However, the project will only be providing passive recreational opportunities for people to enjoy during the day. The project area would be closed pending any forecasted flood event.

j) Would the project result in inundation by seiche, tsunami, or mudflow?

Thresholds of Significance

Project results in inundation by seiche, tsunami or mudflow.

Assessment

The project will have a less than significant impact.

The project is located in an area designated as a Tsunami Evacuation Area, and is likely also subject to seiche, but with the implementation of mitigation measure there should be no risk to people using the area. Because there are existing tsunami evacuation plans for the area (including tsunami sirens), and the project includes additional tsunami hazard signage, the tsunami risk is anticipated to be less than significant. The project is therefore not expected to expose people to significant risk, loss, injury or death from tsunami inundation.

10. Land Use and Planning

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?				✓
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				✓
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				✓

a) Would the project physically divide an established community?

Thresholds of Significance

Physically divide an established community.

Assessment

The project will have no impact. There are no established communities at the site. The project is in areas of open space that are largely isolated from any established communities by U.S. Highway 101and California Highway 255, with the exception of the South G Street neighborhood, which will not be divided or impacted by this project.

b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Thresholds of Significance

Failure to comply with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project.

Assessment

The Project will have no impact. The project complies with the City's Local Coastal Program (LCP), and local/state/federal resource protection regulations.

Underlying all resource regulations is the City's Land Use Plan (LUP) and Implementation Plan (IP) designations in the project area, which includes NRP. The project is located in an unzoned portion of Humboldt Bay adjacent to the AMWS, which is zoned NRP. Wetland restoration is an allowable use in NRP designated areas.

The City of Arcata's certified LUP identifies multiple natural resources related goals and policies. The proposed inter-tidal wetland and riparian restoration project is consistent with the with the City of Arcata.

Additionally, the pilot projects comply with requirements for allowable fill under the California Coastal Act (Section 30233 (a) (7)) as a nature study. The pilot projects further comply with criteria for allowable fill under Section 30233(c) of the California Coastal Act: *In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary.*

c) Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?

Thresholds of Significance

If the Projected is located in an area with an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan, is it inconsistent with the applicable Plan?

Assessment

The project will have no impact.

As detailed in Section 4f (Biological Resources), there are no habitat or natural community conservation plans that cover the project area, therefore, no impact has been identified.

Table 1. *Summary of local, state, and federal agencies with jurisdiction over the proposed project.*

Agency	Statute	Permits
City of Arcata	Local Coastal Program; State Planning and Zoning law (CGC Sections 65000 et. seq.)	Use Permit
Humboldt Bay Harbor, Recreation, and Conservation District	Administers State sovereign tidelands beneath Humboldt Bay	Shoreline Development Permit
North Coast Water Quality Control Board	California Porter-Cologne Water Quality Control Act (WQCA) of 1969 (CWC Section 13000 et seq.)	Water Quality Certification;
California Coastal Commission	California Coastal Act of 1976 (CCA) PRC Section 30000 et seq.; State Executive Order W-59-93 that established a State Wetland Conservation Policy (WCP), often referred to as the *"no-net loss of wetlands policy";* Section 30233: allowable uses of wetland fill include nature studies.	Coastal Development Permit
U.S. Army Corps of Engineers	Rivers and Harbor Act (RHA) of 1899 (33 U.S.C. 401 et seq.), Clean Water Act (CWA) of 1972 (33 U.S.C. 1341 et seq., Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. 1451 et seq.), National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470 et seq.), and the National Environmental Policy Act (NEPA) of 1970 (42 U.S.C. 4332 et seq.).	Nationwide Permit #54
National Oceanic and Atmospheric Administration	Endangered Species Act (ESA) of 1973 (16 U.S.C. 1536 et seq.), Fish and Wildlife Coordination Act (FWCA) of 1934 (16 U.S.C. 661 et seq.), Magnuson-Stevens Act (MSA) of 1996 (16 U.S.C. 1801 et seq.),	Consultation with the US. Army Corps of Engineers
U.S. Fish and Wildlife Service	Endangered Species Act (ESA) of 1973 (16 U.S.C. 1536 et seq.), Fish and Wildlife Coordination Act (FWCA) of 1934 (16 U.S.C. 661 et seq.)	Consultation with the US. Army Corps of Engineers

11. Mineral Resources

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

a) Would the project 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?

Thresholds of Significance

Development of land overlying a mineral resource that would physically preclude future access to that resource.

Assessment

The project will have no impact. The proposed project is located for the most part on diked former salt marsh; there are no mineral resources underlying this area

b) Would the project 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?

Thresholds of Significance

Loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Assessment

No impact, as no such delineation exists for the project area.

12. Noise

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		✓		
b) Expose persons to or generate excessive ground borne vibration or ground borne noise levels?				✓
c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				✓
d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?				✓
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				✓
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				✓

a) Would the project expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Thresholds of Significance

Generating noise and exposing people to noise in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Assessment

The project will have a less than significant impact with the incorporation of mitigation. Noise resulting from this project will be compliant with the City's General Plan Noise Element.

The project may temporarily generate noise at the work site that exceeds 85 db for a short-term period when using heavy equipment. Workers in close proximity to operating equipment and equipment operators will be exposed to noise levels in excess of 85 db, however standard workplace safety protocol ensures that noise reduction measures be taken to reduce exposure. This includes, but is not limited to using hearing protection to supplement noise reduction; using equipment with factory-equipped mufflers; limiting use of noisy equipment whenever possible; and shielding noisy equipment with less noisy equipment or with temporary barriers.

With mitigation incorporated, the minor incremental increase in noise associated with the restoration project and trail construction, use, and maintenance activities would not expose persons to noise levels in excess of applicable standards and would not represent a significant increase in noise. The impact is less than significant with **Mitigation Measures 12.1 - 12.2** incorporated.

Mitigation Measures

12.1 Restrict noise from construction to daytime hours. Hours of construction for outdoor activities exceeding 50 dBA shall be limited to Monday through Friday 8:00 a.m. to 7:00 p.m. on Saturdays from 9:00 a.m. to 700 p.m. Consistent with the City's Noise regulations, no heavy equipment related construction activities shall be allowed on Sundays or holidays. Movement and hauling of material, and associated activities such as re-fueling or maintenance, shall be limited to normal working hours for the area, as specified above. More restrictive operation hours may be specified in the construction documents and may be property-specific.

12.2 If necessary, limit public access to adjacent trails within the Arcata Marsh and Wildlife Sanctuary during construction to avoid exposing people to noise levels higher than standards established in the local general plan, or applicable standards of other agencies.

b) Would the project expose persons to or generate excessive ground borne vibration or ground borne noise levels?

Thresholds of Significance

Generate excessive ground borne vibration or noise levels.

Assessment

The project will have no impact. Project activities do not include construction techniques that involve ground borne vibrations.

c) Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Thresholds of Significance

Substantial permanent increase of ambient noise levels in the project vicinity.

Assessment

The project will have no impact. The project does not involve any operational feature that would cause any permanent increase to noise levels. The project will, therefore, not result in any permanent increase in ambient noise levels in the project vicinity above levels existing without the project. The type and intensity of recreational use is not expected to increase above current levels.

d) Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Thresholds of Significance

Substantial temporary or periodic increase of ambient noise levels.

Assessment

The project will have a less than significant impact.

Construction activities would result in a minor temporary increase in ambient noise levels from construction equipment and construction-related traffic for a very short duration of time. Construction will include using heavy equipment for hauling and place large rocks for one of the three pilot project sites. Back-up beepers on heavy equipment vehicles will cause temporary noise in excess of ambient levels during daylight hours, but project construction is of short duration and this noise increase is not considered substantial.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Thresholds of Significance

Expose people to excessive noise levels within the vicinity of a public airport.

Assessment

The project will have no impact.

The project is not within two miles of an airport.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Thresholds of Significance

Expose people to excessive noise levels within the vicinity of a private airport.

Assessment

The project will have no impact.

The project is not within the vicinity of any airport.

13. Population and Housing

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

a) Would the project induce substantial population growth in an area, either directly (e.g., by proposing new homes and/or businesses) or indirectly (e.g., through extension of roads or other infrastructure)?

Thresholds of Significance

Result in substantial population growth in the area.

Assessment

The project will have no impact. The project inter-tidal salt marsh restoration and sea level rise protection only. The project will not involve construction of any facility that will directly or indirectly induce population growth. Therefore, the project will have no impact on population growth.

b) Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Thresholds of Significance

Displace significant housing units in the area.

Assessment

The project will have no impact. The project is limited to restoring salt marsh and protect vulnerable shorelines and City infrastructure from anticipated sea level rise. The project area is not zoned for housing and does not presently include housing. The project will not displace any existing housing.

c) Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Thresholds of Significance

Displace a significant number of people.

Assessment

The project will have no impact. The project will not result in displacement of people from these, or any other, community.

14. Public Services

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?				✓

a-e) <u>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.</u>

Thresholds of Significance

Result in increased need for public services such as fire and police protection, schools, and parks.

Assessment

The project will have no impact.

The project will not result in any new structures or use that will result in the need for additional public services, including fire protection, police protection, schools, parks, or other public facilities. The existing trail network within the AMWS will not be expanded and visitor use is not expected to change as a result of this project.

15. Recreation

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) 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?				✓
b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				✓

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Thresholds of Significance

Increased use of parks or other recreational facilities in the area resulting in substantial deterioration of facilities.

Assessment

The project will have no impact. The existing trail network within the Arcata Marsh and Wildlife Sanctuary will not be expanded and visitor use is not expected to change as a result of this project. If the project is not implemented, sea level rise will eventually flood and/or erode many of the trails within the AMWS, limiting future visitor use as well as contributing to the direct physical deterioration of this core public recreation area within the City of Arcata.

b) Would the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Thresholds of Significance

Include or require the construction or expansion of recreational facilities in the area. Which might have an adverse physical effect on the environment.

Assessment

The project will have no impact. The project does not include the construction or expansion of any recreational facilities.

16. Transportation/Traffic

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				✓
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				✓
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?				✓
d) Substantially increase hazards due to design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				✓
e) Result in inadequate emergency access?				✓
f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				✓

a) Would the project exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Thresholds of Significance

Substantial increase in the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections.

Assessment

The project will have no impact

The implementation of the pilot projects will not increase the number of vehicle trips in this area.

b) Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Thresholds of Significance

Conflict with applicable congestion management program.

Assessment

The project will have no impact.

The implementation of the pilot projects will not increase the number of vehicle trips in this area.

c) Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?

Thresholds of Significance

Change air traffic patterns that would result in a safety risk.

Assessment

The project will have no impact. The implementation of the pilot projects will not affect air traffic patterns or use.

d) Would the project substantially increase hazards due to design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Thresholds of Significance

Substantially increase hazards due to transportation design features or incompatible uses.

Assessment

The project will have no impact. The implementation of the pilot projects will not affect any roadway features or substantially increase hazards due to design features.

e) Would the project result in inadequate emergency access?

Thresholds of Significance

Result in inadequate emergency access.

Assessment

The project will have no impact.

The implementation of the pilot projects will not impair emergency access in any way.

f) Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

Thresholds of Significance

Conflict with plans or policies regarding alternative modes of transportation.

Assessment

The project will have no impact.

The implementation of the pilot projects will not conflict with any plans or policies for alternative modes of transportation.

17. Tribal Cultural Resources

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				✓
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or				✓
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				✓

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

I. **Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or**
II. **A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.**

Threshold of significance

Adversely alter tribal cultural resources.

Assessment

The project will have no impact.

Public Resources Code section 21074 defines tribal cultural resources and includes sites, features, places, cultural landscapes, sacred places, and object with cultural values to a California native American tribes. Tribal cultural resources are cultural resources that may be eligible for listing in the California Register of Historic Resources or similar registers or is determined eligible by the lead agency.

Through ongoing consultation efforts, affected tribes will be notified of project construction dates and arrangements can be made to accommodate tribal personnel wishing to observe project excavation activities, and THPOs will be contacted immediately should potential cultural resources be discovered during construction.

Consultation with California Native American tribes traditionally and culturally affiliated with the project area has occurred pursuant to Public Resources Code section 21080.3.1.

Date Consultation Offered: August 23, and 24, 2017

Date Consultation Begun: Consultation responses were received on August 29, September 1, and September 13, 2017 from three area tribes.

Consultation occurred early in the CEQA process to allow tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (Public Resources Code section 21083.3.2.) Information was requested from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation.

18. Utilities and Service Systems

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				✓
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✓
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✓
d) Have insufficient water supplies available to serve the project from existing entitlements and resources (i.e., new or expanded entitlements are needed)?				✓
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				✓
f) Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs?				✓
g) Violate any Federal, State, and local statutes and regulations related to solid waste?				✓

a) Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Thresholds of Significance

Exceed wastewater treatment requirements of the North Coast Regional Water Quality Control Board.

Assessment

The project will have no impact. The project will not result in a change of use that alters existing wastewater treatment demands associated with use of the resort.

b) Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Thresholds of Significance

Require or result in a substantial demand for new water or wastewater facilities affecting existing entitlements and resources.

Assessment

The project will have no impact.

The project will not Increase demand for new water or wastewater facilities in this area. A purpose of the pilot project is to better protect the City of Arcata from anticipated impacts directly resulting from sea level rise, including future impacts to the City's wastewater treatment facility. Absent measures to protect the facility from sea level rise impacts, this essential public facility will likely flood and eventually becoming unusable in its present location. By implementing this project, the City of Arcata is seeking to identify functional techniques to avoid future impacts to public facilities resulting from sea level rise.

c) Would the project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Thresholds of Significance

Require construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Assessment

The project will have no impact.

The project will not require construction of new storm water drainage facilities or expansion of existing facilities in this area.

d) Would the project have insufficient water supplies available to serve the project from existing entitlements and resources (i.e., new or expanded entitlements are needed)?

Thresholds of Significance

Have insufficient water supplies available to serve the project.

Assessment

The project will have no impact.

The project will not affect water supplies in this area.

e) Would the project result in a determination by the wastewater treatment provider, which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Thresholds of Significance

Result in inadequate wastewater treatment capacity.

Assessment

The project will have no impact.

The project will not affect wastewater treatment capacity in this area.

f) Would the project be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs?

Thresholds of Significance

Result in an insufficient provision for solid waste disposal.

Assessment

The project will have no impact.

The project will not affect solid waste disposal in this area.

g) Would the project violate any Federal, State, and local statutes and regulations related to solid waste?

Thresholds of Significance

Violate any regulations related to solid waste.

Assessment

The project will have no impact.

The project will not affect solid waste disposal in this area.

19. Mandatory Findings of Significance

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to 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, 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?		✓		
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).		✓		
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?		✓		

a) <u>Does the project have the potential to 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?</u>

Thresholds of Significance

Project has impacts associated with any of the environmental topics identified in the Initial Study (Appendix G CEQA Guidelines) that cannot be mitigated to less than significant levels.

Assessment

The project will have a less than significant impact with the successful implementation of mitigation measures. As discussed herein under Section 4 (Biological Resources), Section 5 (Cultural Resources), Section 8 (Hazards and Hazardous Materials), and Section 12 (Noise), the project, with the successful implementation of mitigation measures, does not have the potential to 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.

Degrade the quality of the environment

The project will not degrade the quality of the environment. Please refer to previous discussions of no impact: Section 2 (Agricultural Resources), Section 7 (Greenhouse Gas Emissions), , Section 10 (Land Use), Section 11 (Mineral Resources), Section 13 (Population and Housing), Section 14 (Public Services), Section 15 (Recreation), Section 16 (Transportation and Traffic), Section 17 (Tribal Cultural Resources), and Section 18 (Utilities), as well as discussion of less than significant impact including Section 1 (Aesthetics), Section 3 (Air Quality), Section 6 (Geology and Soils), and Section 9 (Hydrology and Water Quality). Please also refer to previous discussion of less than significant impact with successful implementation of mitigation measures in Section 4 (Biological Resources), Section 8 (Hazards and Hazardous Materials), and Section 12 (Noise), and mandatory findings of significance) in this initial study.

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

The project will not substantially reduce habitat, cause fish or wildlife populations to drop, or threaten to eliminate a plant or animal community.

Substantially reduce the number or restrict the range of a rare or endangered plant or animal.

The project with the successful implementation of mitigation measures (biological resources and cumulative effects) will not substantially impact any rare or endangered plant or animal, including the range of any such species.

Eliminate important examples of the major periods of California history or prehistory

As discussed under Section 5 (Cultural Resources) and Section 17 (Tribal Cultural Resources), the project will have no significant impact on any historic or cultural resource with the implementation of mitigation measures to address inadvertent cultural, archaeological, or paleontological discovery, although such discovery is considered extremely unlikely in the mudflat environment of the project location.

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

Thresholds of Significance

The incremental effects of a project are cumulatively considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

Assessment

There will be less than significant impact with the successful implementation of mitigation measures.

c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

Thresholds of Significance

The project will have environmental impacts that cause substantial adverse effects on human beings, either directly or indirectly.

Assessment

The project's environmental impacts that may directly affect people have been determined to be less than significant. The project will have less than significant impacts in its indirect effects to people with the successful implementation of mitigation measures.

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Mitigation, Monitoring, and Reporting Program

4. Biological Resources

4.1 Prior to implementation, the City will survey the shoreline adjacent to each pilot project site to determine if special status plant species are present. If present, the City will avoid populations of these species to the extent possible. Populations that would be unavoidably impacted will be transplanted to suitable locations adjacent to the site prior to construction.

Timing for Implementation/Compliance: Prior to construction at seasonally appropriate time for plant identification
Person/Agency Responsible for Monitoring: City of Arcata Environmental Services, qualified biologist
Monitoring Frequency: If present, spot check throughout construction
Evidence of Compliance: Visual inspection, photo documentation, summary report

4.2 For areas with suitable eel grass habitat elevations, the City will conduct a pre-construction eelgrass survey in the vicinity of each pilot project site during the active growing season for eelgrass (May through September) that complies with the 2014 NOAA California Eelgrass Mitigation Policy and Implementing Guidelines**.** If pre-construction eelgrass surveys indicate eelgrass will be impacted by the pilot project sites, the City will replace the eelgrass in a similar suitable location on a 1:1 basis.

Timing for Implementation/Compliance: Prior to construction during eelgrass growing season
Person/Agency Responsible for Monitoring: City of Arcata Environmental Services
Monitoring Frequency: Once, prior to construction
Evidence of Compliance: Visual inspection, photo documentation, summary report

5. Cultural Resources

5.1 If potential archaeological or paleontological resources are encountered during project subsurface construction activities or geotechnical testing, all work within 50 ft of the find shall be stopped, and a qualified archaeologist shall be contacted to evaluate the find, determine its significance, and identify any required mitigation. The applicant shall be responsible for implementing the mitigation prior to construction activities being re-started at the discovery site.

Timing for Implementation/Compliance: During construction
Person/Agency Responsible for Monitoring: City of Arcata Environmental Services
Monitoring Frequency: Continuous during construction
Evidence of Compliance: Visual inspection, written report if resources are encountered

5.2 If project related geotechnical excavations become necessary, as a result of final design, and those excavations are to be more than one ft deep, then the THPOs of each local native American tribe, will be contacted and given the date and time of excavations so that a cultural monitor may be present to observe for the presence of buried archaeological materials.

Timing for Implementation/Compliance: Minimum one week prior to commencement of work

Person/Agency Responsible for Monitoring: City of Arcata Environmental Services to provide notification, THPO to conduct cultural monitoring
Monitoring Frequency: Continuous during construction
Evidence of Compliance: Monitoring summary

8. Hazards and Hazardous Materials

8.1 Fueling and maintenance of equipment shall be conducted off-site, or in designated staging areas that are no closer than 150 ft from open water or in any location where hazardous material spills could become entrained in flowing water.

Timing for Implementation/Compliance: During construction
Person/Agency Responsible for Monitoring: City of Arcata Environmental Services,
Monitoring Frequency: Spot checks
Evidence of Compliance: Visual inspection

8.2 Prior to the onset of work the contractor shall prepare a plan for the prompt and effective response to any accidental spills.

Timing for Implementation/Compliance: Prior to and during construction
Person/Agency Responsible for Monitoring: City of Arcata Environmental Services
Monitoring Frequency: Spot checks
Evidence of Compliance: Construction contract submittal

12 Noise

12.1 Restrict noise from construction to daytime hours. Hours of construction for outdoor activities exceeding 50 dBA shall be limited to Monday through Friday 8:00 a.m. to 7:00 p.m. on Saturdays from 9:00 a.m. to 700 p.m. Consistent with the City's Noise regulations, no heavy equipment related construction activities shall be allowed on Sundays or holidays. Movement and hauling of material, and associated activities such as re-fueling or maintenance, shall be limited to normal working hours for the area, as specified above. More restrictive operation hours may be specified in the construction documents and may be property-specific.

Timing for Implementation/Compliance: During construction
Person/Agency Responsible for Monitoring: City of Arcata Environmental Services,
Monitoring Frequency: Spot checks
Evidence of Compliance: Construction contract requirement

12.2 If necessary, limit public access to adjacent trails within the Arcata Marsh and Wildlife Sanctuary during construction to avoid exposing people to noise levels higher than standards established in the local general plan, or applicable standards of other agencies.

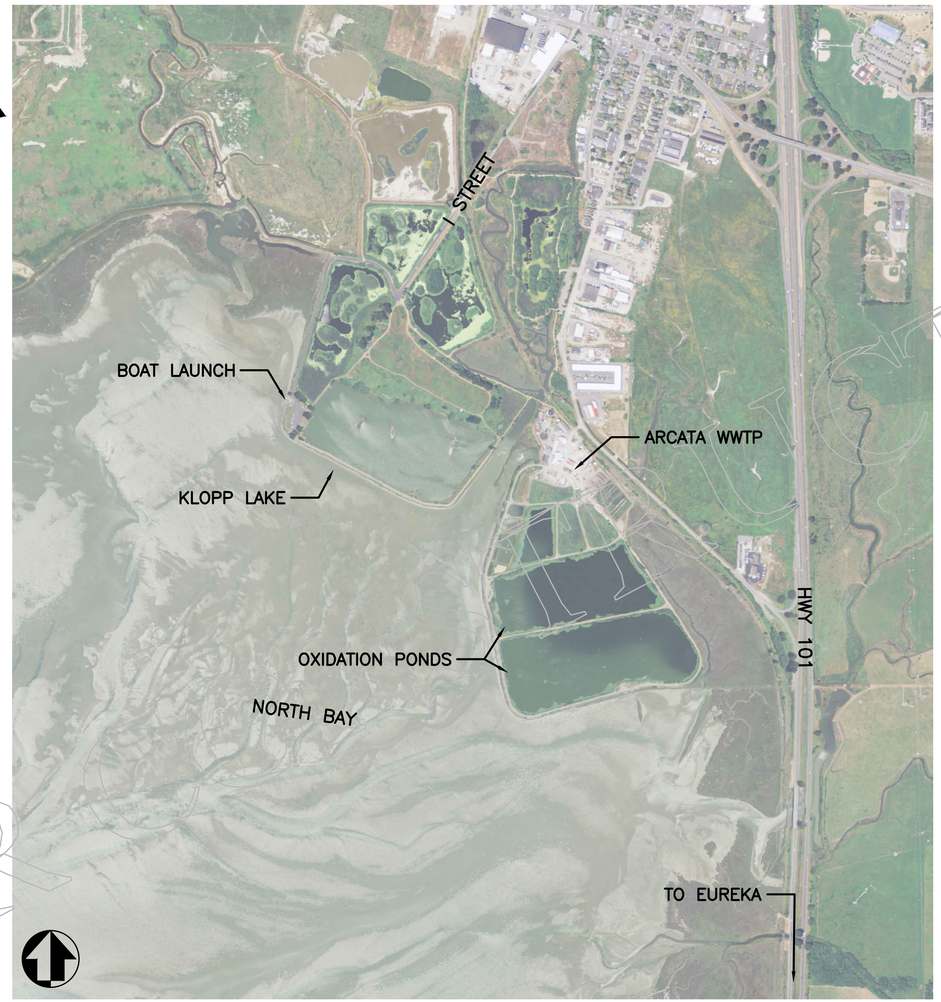
Timing for Implementation/Compliance: During construction
Person/Agency Responsible for Monitoring: City of Arcata Environmental Services

Monitoring Frequency: If necessary, as needed
Evidence of Compliance: Copies of trail closure signs

Appendix A

65% Project Designs

LIVING SHORELINE PILOT DEMONSTRATION CONCEPTS
CITY OF ARCATA, CALIFORNIA



SHEET INDEX

65% LEVEL PLANS
FOR PERMITTING PURPOSES ONLY

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TITLE OF PROJECT
LIVING SHORELINE PILOT STUDY
PREPARED FOR
CITY OF ARCATA &
STATE COASTAL CONSERVANCY
Arcata Bay Adaptation Measures
Grant Agreement # 13-099

SHEET 1 OF 8

NOTES INTENTIONALLY LEFT BLANK AT 65% DESIGN

PROJECT CUT/FILL VOLUMES AND AREAS

Impact Area

Location	# of Type A&B Cells	# of Type C Cells	Total Type A&B Cell Area* (sqft)	Total Type C Cell Area** (sqft)	Total Area (sqft)	Total Area (ac)
Site 1	5	0	13070	0	13070	0.30
Site 2	2	0	7052	0	5228	0.12
Site 3	1	1	0	3526	6140	0.14
Site 4	1	2	0	7052	9666	0.22
Total	**9**	**3**	**20122**	**10578**	**34104**	**0.78**

* Footprint area based on Pilot Cell A geometry (2614sqft)
** Pilot Cell C footprint is 3526sqft

Rock Sill Volume

Location	# of Sill/Mounds	Length of Sill (ft)	Cross-sectional Area of Sill (sqft)	Volume (cuft)	Volume (cuyd)	Weight* (ton)
Site 1	0	0	0	0	0	0
Site 2	0	0	0	0	0	0
Site 3	1	125	50	6250	231	361
Site 4	2	125	50	12500	463	722
Total	**3**	**250**	**100**	**18750**	**694**	**1083**

* Assume 30% void space and rock specific gravity of 2.65

Pilot Cell Logs

Item	Size	Length	Count
Large Logs	12" to 30" Diameter	16' to 25'	18 Logs
2-Ton Boulders	2-Ton	NA	72 Tons

Wetland Log Structures

Item	Size	Length	Count
Large Logs	12" to 30" Diameter	16' to 25'	26 Logs
Pinning Logs	6" to 12" Diameter	16' to 20'	27 Logs

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Northern Hydrology & Engineering

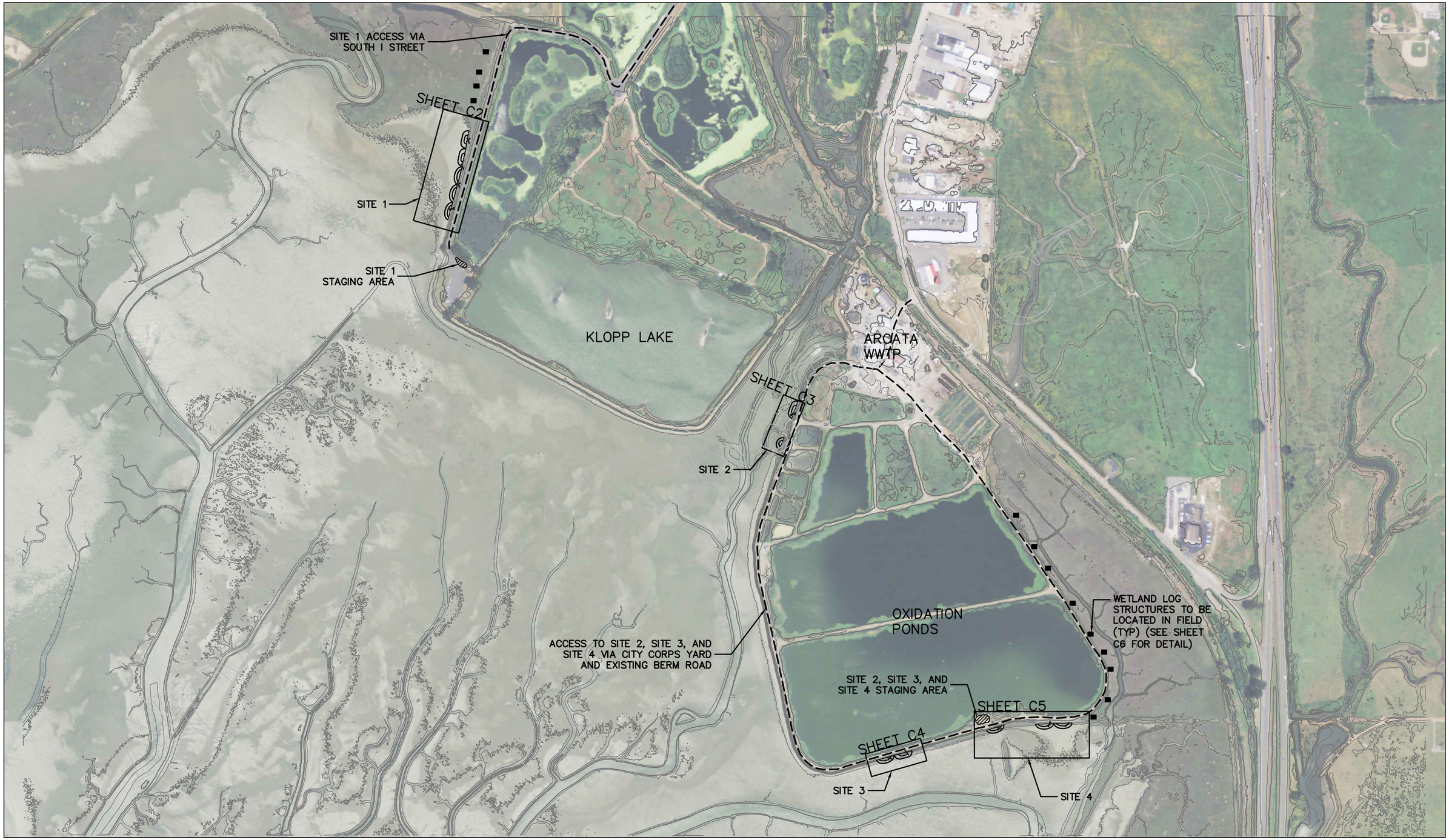
DESIGNED: JKA, CEP
DRAFTED: CEP
TECH. REVIEW: JKA
DATE: 9/25/2017

SUB SHEET NO. G2

NOTES

LIVING SHORELINE PILOT STUDY

65% LEVEL PLANS



LEGEND

- EXISTING CONTOURS (2FT) (LIDAR)
- DESIGN BOUNDARY
- ACCESS ROAD
- PILOT CELL LOGS
- WETLAND LOG STRUCTURE

250 0 250 500
SCALE OF FEET

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TECH. REVIEW:	JKA
DATE:	9/25/2017

SUB SHEET NO. C1

SITE PLAN
OVERVIEW
LIVING SHORELINE PILOT STUDY
65% LEVEL PLANS

SHEET 3 OF 8

NOTE:
SEE SHEET C6 FOR TYPICAL DETAILS

30 0 30 60
SCALE OF FEET

MUD FLAT

EXISTING MARSH VEGETATION

PILOT CELL B

OYSTER SHELL BAG (OPTIONAL)

STAKED COIR LOG (TYP)

STAKED COIR LOG/WILLOW WATTLE (TYP)

PILOT CELL A

COIR MAT (OPTIONAL)

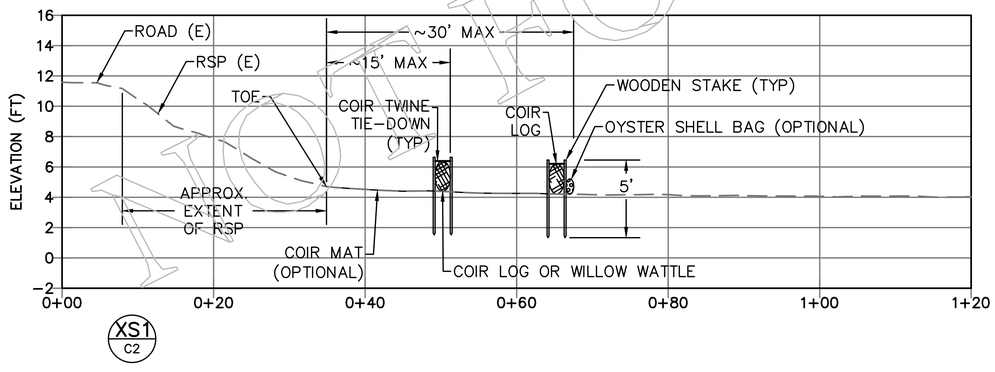
COIR MAT (OPTIONAL)

XS1 C2

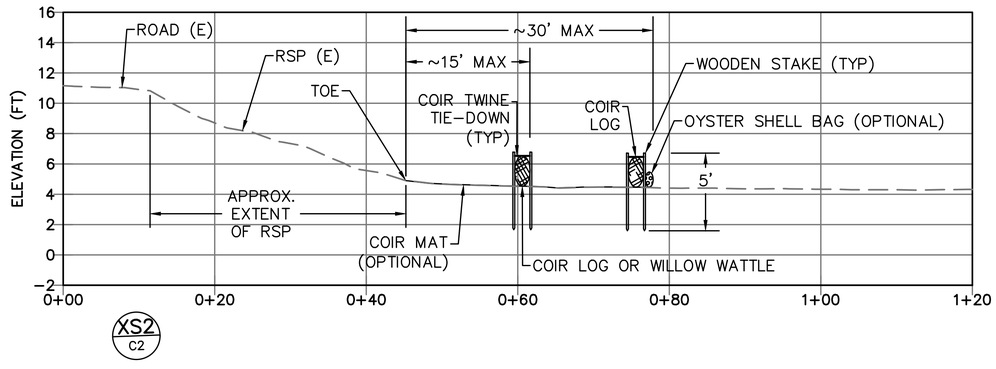
XS2 C2

PILOT CELL LOGS TO BE LOCATED IN FIELD (SEE SHEET C6) (TYP)

I STREET



XS1 C2



XS2 C2

LEGEND

EXISTING CONTOURS (1FT) (LIDAR)

PILOT CELL LOGS

NOTE:
ELEVATIONS REFERENCED TO NAVD88

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Northern Hydrology & Engineering

DESIGNED: JKA, CEP
DRAFTED: CEP
TECH. REVIEW: JKA
DATE: 9/25/2017

SUB SHEET NO. C2

SITE 1
OVERVIEW & CROSS SECTIONS
LIVING SHORELINE PILOT STUDY
65% LEVEL PLANS

SHEET 4 OF 8

NOTE:
SEE SHEET C6 FOR TYPICAL DETAILS

10 0 10 20
SCALE OF FEET

PILOT CELL B

PILOT CELL LOGS TO BE LOCATED IN FIELD (SEE SHEET C6) (TYP)

PILOT CELL A

OYSTER SHELL BAG (OPTIONAL)

STAKED COIR LOG (TYP)

STAKED COIR LOG/WILLOW WATTLE (TYP)

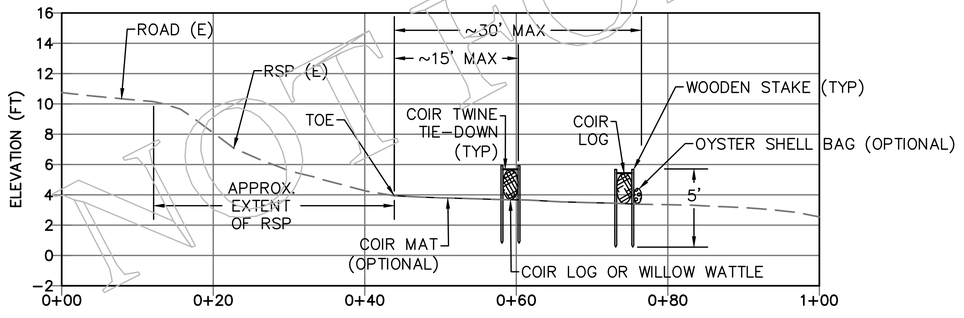
COIR MAT (OPTIONAL)

COIR MAT (OPTIONAL)

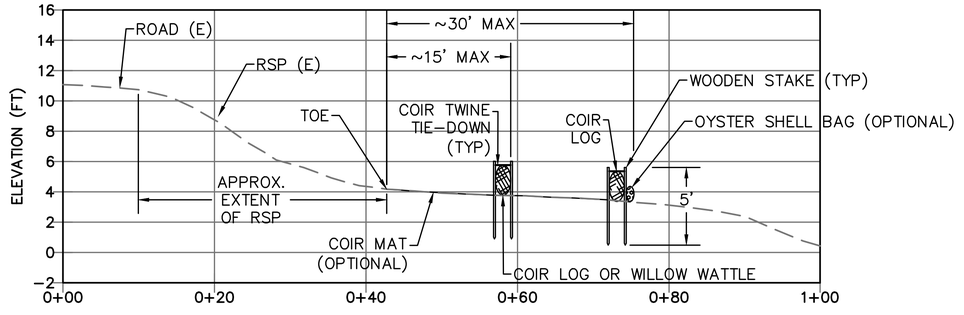
ACCESS ROAD

XS3 C3

XS4 C3



XS3 C3



XS4 C3

LEGEND

EXISTING CONTOURS (1FT) (LIDAR)

PILOT CELL LOGS

NOTE:
ELEVATIONS REFERENCED TO NAVD88

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No. 50713
CIVIL
STATE OF CALIFORNIA

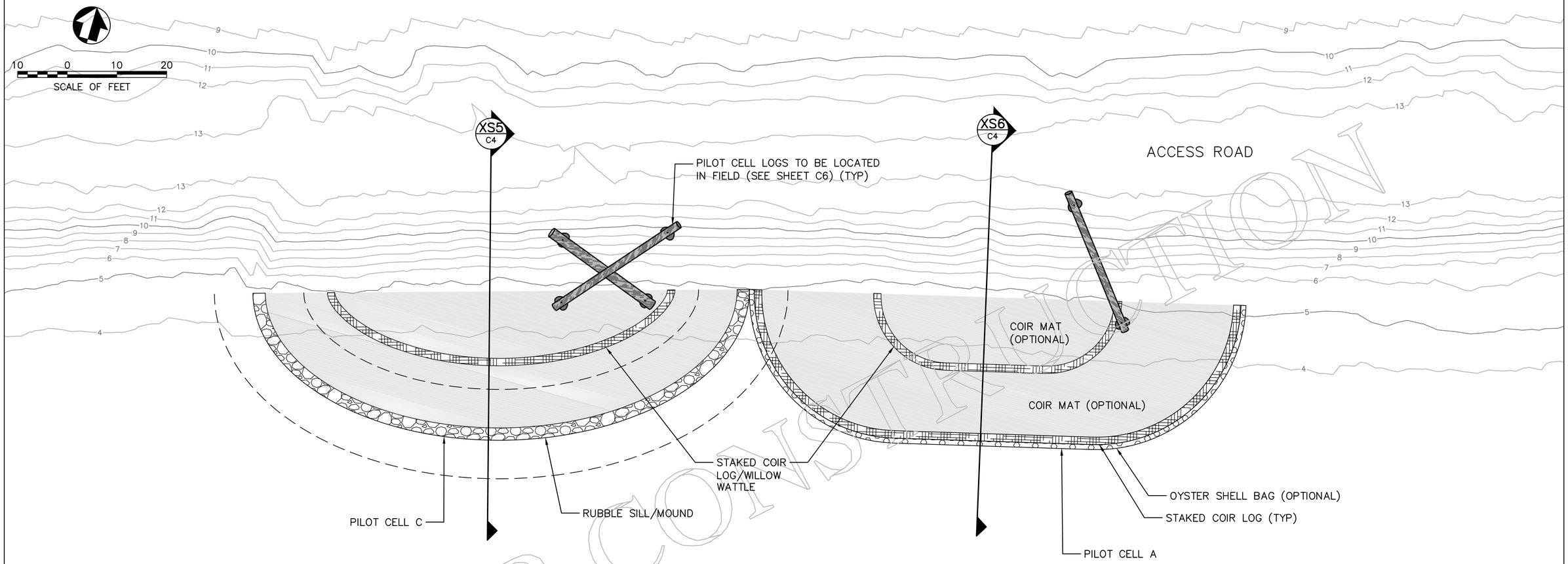
Northern Hydrology & Engineering

DESIGNED:	JKA, CEP
DRAFTED:	CEP
TECH. REVIEW:	JKA
DATE:	9/25/2017

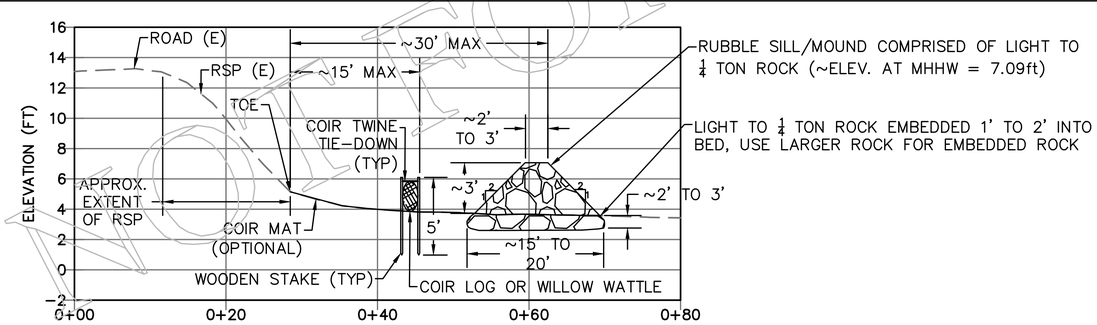
SUB SHEET NO.
C3

SITE 2
OVERVIEW & CROSS SECTIONS
LIVING SHORELINE PILOT STUDY
65% LEVEL PLANS

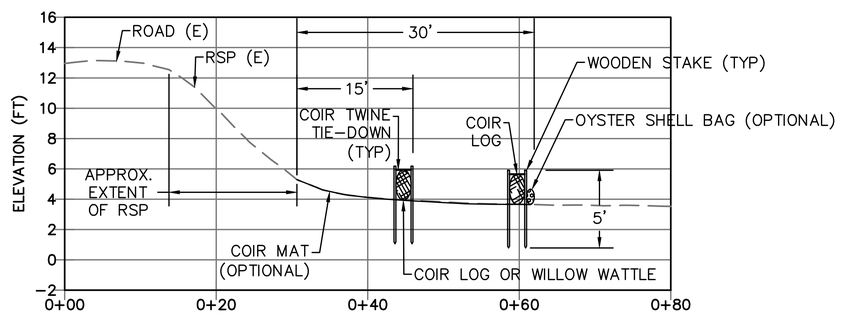
SHEET 5 OF 8



NOTE:
SEE SHEET C6 FOR TYPICAL DETAILS



XS5
C4



XS6
C4

LEGEND
- EXISTING CONTOURS (1FT) (LIDAR)
- RUBBLE SILL/MOUND FOOTPRINT
- PILOT CELL LOGS

NOTE:
ELEVATIONS REFERENCED TO NAVD88

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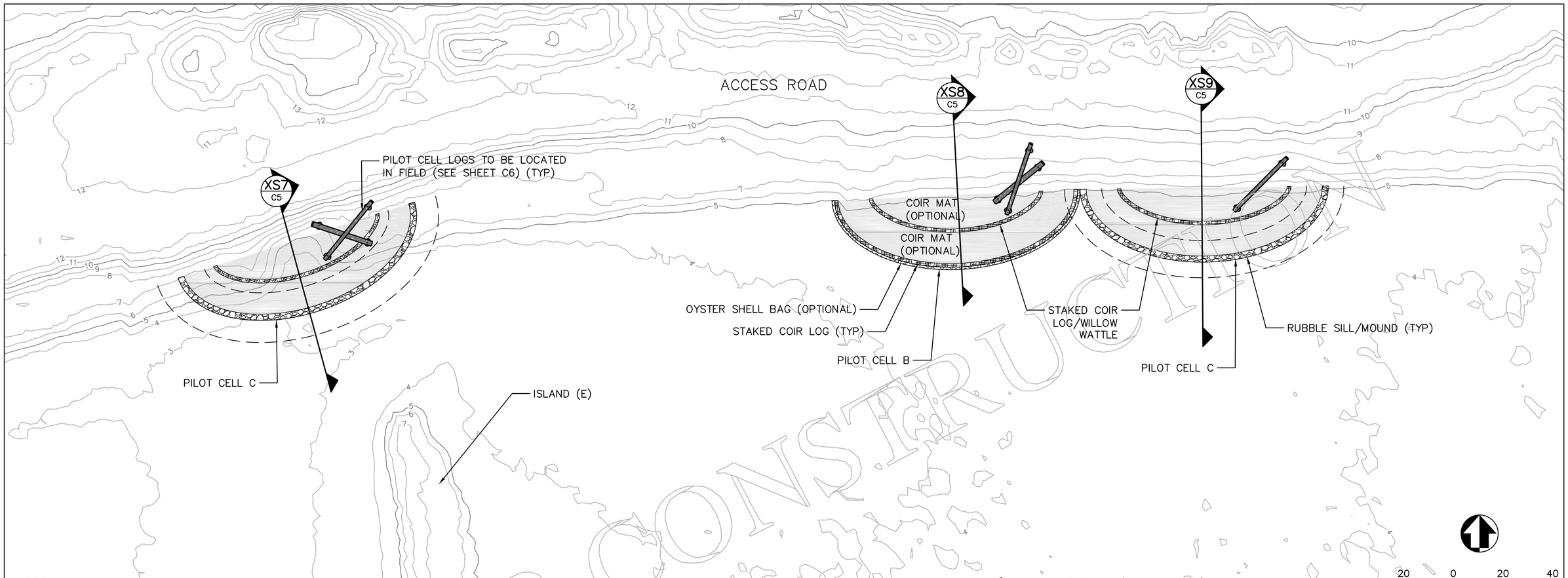
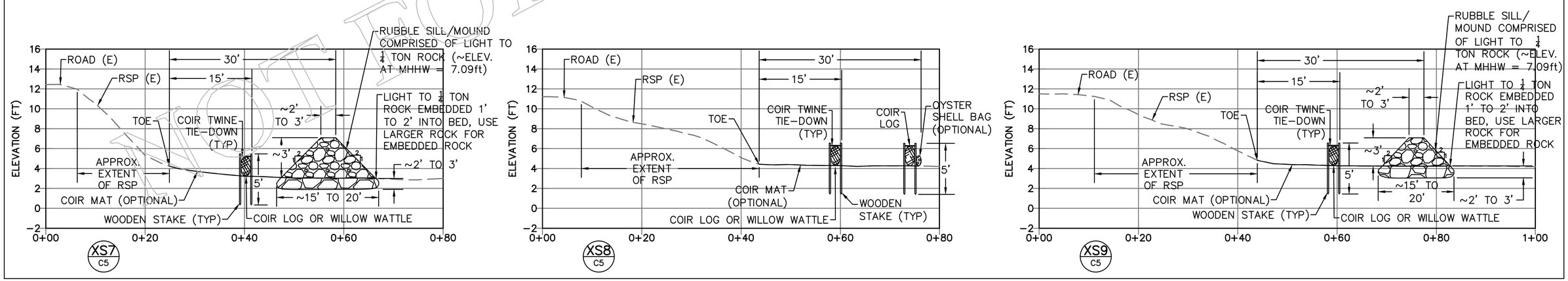
SUB SHEET NO. C4

SITE 3
OVERVIEW & CROSS SECTIONS
LIVING SHORELINE PILOT STUDY
65% LEVEL PLANS

SHEET 6 OF 8



NOTE:
SEE SHEET C6 FOR TYPICAL DETAILS



LEGEND

- EXISTING CONTOURS (1FT) (LIDAR)
- RUBBLE SILL/MOUND FOOTPRINT
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NOTE:
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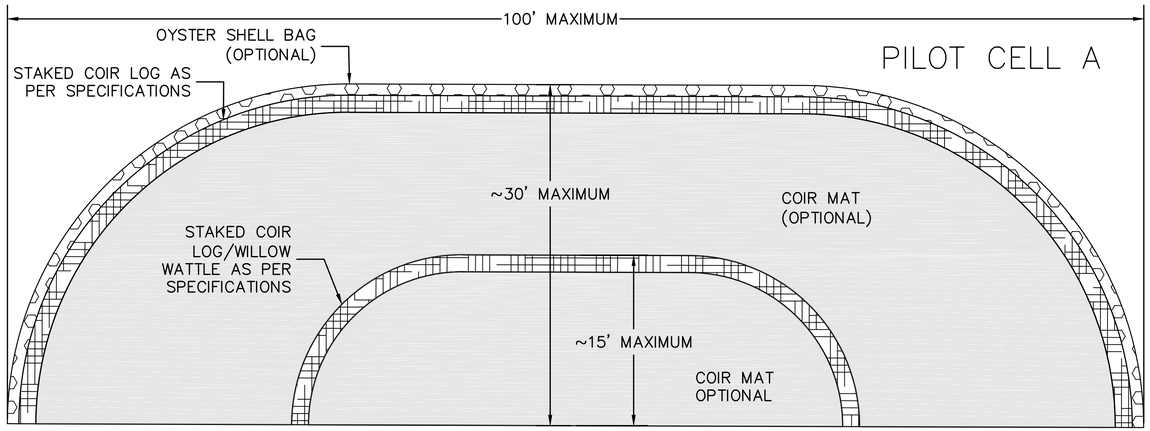
SUB SHEET NO. C5

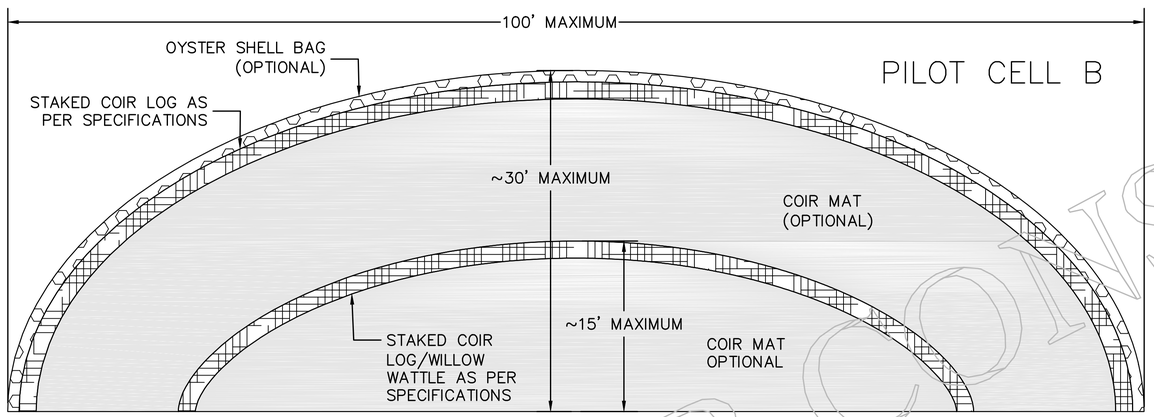
SITE 4
OVERVIEW & CROSS SECTIONS
LIVING SHORELINE PILOT STUDY

65% LEVEL PLANS

SHEET 7 OF 8



PILOT CELL A



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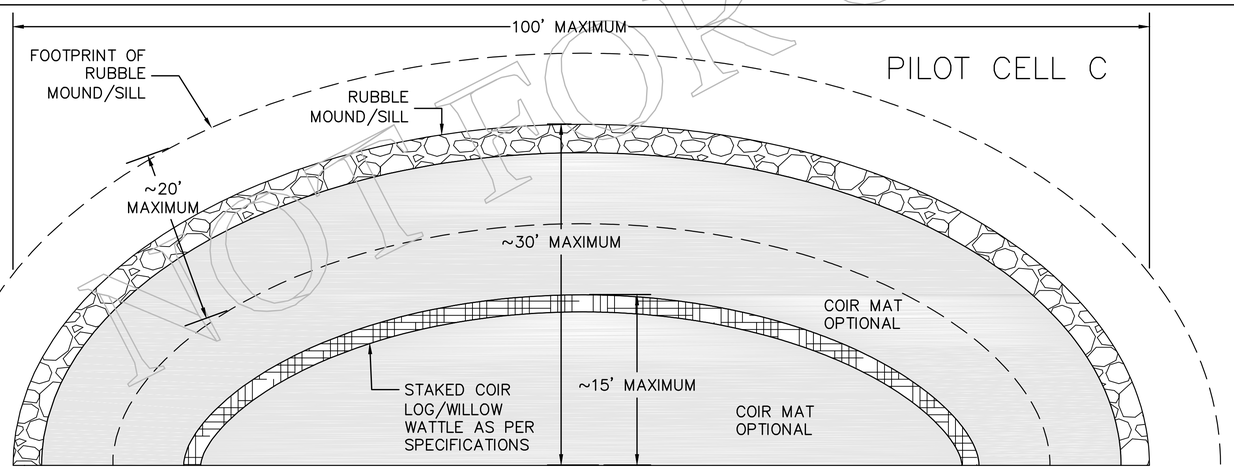
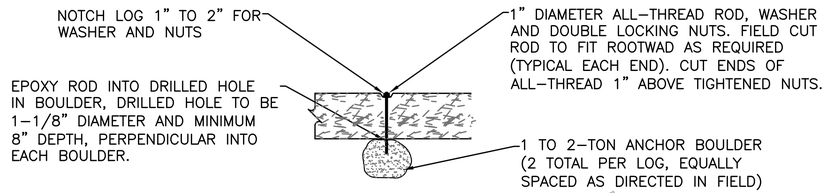
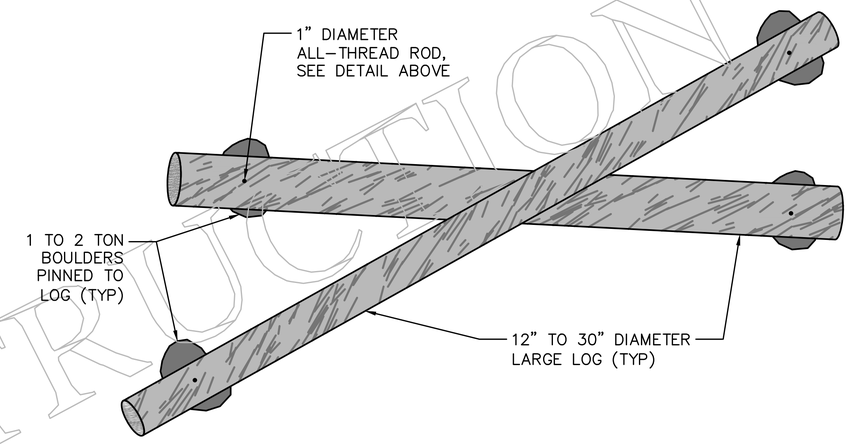


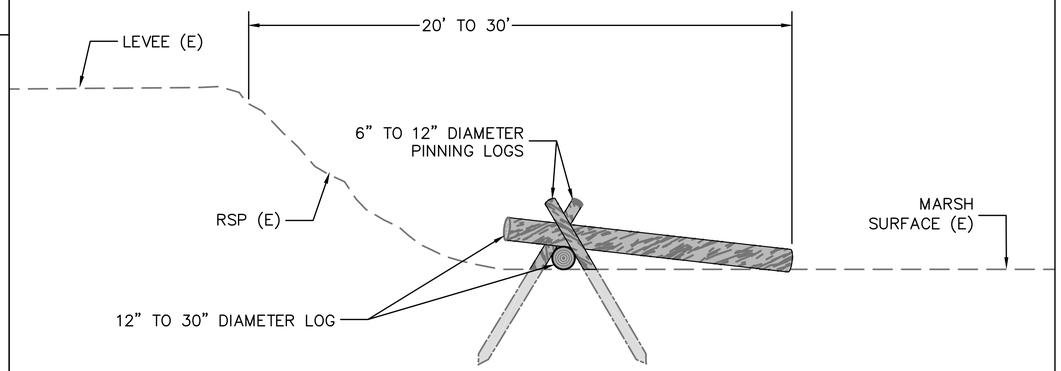
PILOT CELL C





PILOT CELL LOGS PLAN VIEW (NTS)

NOTE: TYPICAL PILOT CELL LOG STRUCTURE WILL CONSIST OF ONE TO TWO LOGS; 12 TO 30 INCH DIAMETER AND 16 TO 25 FEET LONG, ANCHORED BY TWO 1 TO 2 TON BOULDERS. LOG STRUCTURE LOCATION TO BE DETERMINED IN THE FIELD.



WETLAND LOG STRUCTURES (NTS)

NOTE: TYPICAL WETLAND LOG STRUCTURE WILL CONSIST OF TWO LOGS; 12 TO 30 INCH DIAMETER AND 16 TO 25 FEET LONG, PINNED BY TWO 6 TO 12 INCH DIAMETER PINNING LOGS. LOG STRUCTURE LOCATION TO BE DETERMINED IN THE FIELD.

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TYPICAL DETAILS

LIVING SHORELINE PILOT STUDY

65% LEVEL PLANS

SHEET 8 OF 8

Appendix B

Installation Information

Appendix A

Excerpt from the Delaware Estuary Living Shoreline Initiative Practitioner's Guide on living shoreline implementation (Kreeger et al. 2011) :

5) Installation

This section gives a step-by-step method for how to install an entire DELSI site.

1) Complete a site survey to determine elevations were the current vegetation is growing successfully. This could be done with an RTK GPS or Total Station.
2) Mark out with flags where logs are going to sit at the right elevation in a cusp shape
3) Install the Coir fiber mat:
   a. Carry mat to one end of the treatment site (about 200 lbs.) and unwrap plastic.
   b. Position mat so that it can be pushed and rolled out flat.
   c. Roll out the mat at the elevation where the logs will sit and in a cusp shape.

   d. When you reach the end of the desired site, flip mat and roll back for second row of logs.

4) Carry logs and position in cusp shape on top of mat. The logs should be positioned end to end with the ends slightly overlapping. Tie logs ends tightly together with coir twine.

5) Lay out 12,4' pre-drilled stakes per log,6 on each side of each log parallelfrom each other. Put a flat side of the stake tightly against the log and push the stake through the mat under the log

and into the soil. Hint,don't drill the hole too close to the end of the stake or the stake may break when hammering it into the soil. A distance of 3-4 inches down the end is sufficient.

6) Hammer in stakes tightly against logs (6 on each side of log) until pre-drilled holes are flush with top of logs.

7) Cut twine into 5 foot lengths and use one piece for every pair of stakes across from each other on the logs. Loop the twine through the hole of one of the stakes. On the first stake, tie a bowline or similarly secure knot around the stake. Then thread the twine through the outer mesh at the top of the log, pull the twine tight, thread it through the second stake and tie a few half hitches to secure it. Then hammer the stake down until they twine is snug against the log.

8) Reinforce with shell bags lined up end to end in front of each log and place extra shell bags at edges and at joints between logs. Shellbags are made by filling plastic mesh bags with oyster

shell and tying off each end of the plastic bag with overhand knots. An easy way to fill the bags with shell is to use a long PVC pipe as shown and put bag around it. Then pull the PVC out when bag is full and tie of the second end of the bag. The oyster bags are laid in a row in front of the seaward log and extras are placed at the joints between the logs.

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Appendix C

Special Status Species Search Results

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Special-status Species, Their Status, and Potential for Occurrence on the Project Site				
Scientific/Common Name	**Status[i]**	**Habitat**	**Microhabitat**	**Potential for occurrence in project area**
Acipenser medirostris Green Sturgeon	FT	Near-shore marine and estuarine waters	Coastal estuaries, spawn in freshwater	
Eucyclogobius newberryi Tidewater Goby	FE	Brackish water habitats along the California coast from Agua Hedionda lagoon, San Diego Co. to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still by not stagnant water & high oxygen levels	**Possible**. While this species may be present in Humboldt Bay, the species is not likely to be affected by the project.
Spirinchus thaleichthys Longfin Smelt	ST	Bay, estuary and nearshore coastal environments	Mostly found in mid-water or near the bottom of the water column	**Possible.** While this species may be present in Humboldt Bay, the species is not likely to be affected by the project.
Thaleichthys pacificus Euchalon	FT	Nearshore ocean waters and to 1,000 feet in depth	Nearshore ocean waters and to 1,000 feet in depth, spawn in freshwater.	**Possible.** While this species may be present in Humboldt Bay, the species is not likely to be affected by the project
Carex lyngbyei Lyngbye's sedge	2B.2	Marshes and swamps	0m.	**Possible.** This species has been documented to occur in several locations in the immediate vicinity of the project area.
Castilleja ambigua var. humboldtiensis Humboldt Bay owl's clover	1B.2	Coastal salt marsh.	Usually in coastal salt marsh with *Spartina, Distichlis, Salicornia, Jaumear.* 0-3m.	**Present.** This species has been observed to occur in the coastal salt marsh habitat near South I Street and Southeast Klopp Lake sites.

Chloropyron maritumum ssp. Palustre Point Reye's bird's beak	1B.2	Coastal salt marsh	Usually in coastal salt marsh with *Salicornia, Disticlis, Jaumea, Spartina, etc.* 0-15m	**Present.** This species has been observed to occur in the coastal salt marsh habitat near South I Street and Southeast Klopp Lake sites.
Spergularia Canadensis var. *occidentalis* Western sand-spurrey	2B.1	Coastal salt marsh	0-3m	**Present.** This species has been observed to occur in the coastal salt marsh habitat near South I Street and Southeast Klopp Lake sites.
Viola palustris Marsh violet	2B.2	Coastal scrub, bogs and fens	Swampy, shrubby places in coastal scrub or coastal bogs. 0-15m	**Unlikely.** There is no suitable habitat within the project footprint.
Angelica lucida Sea-watch	4.2	Coastal bluff scrub, Coastal dunes, Coastal scrub, Marshes and swamps (coastal saltr)	0-150m	**Possible.,** Suitable habitat may be present and the species has been observed in the vicinity of the project area.
Sidalcea malachroides Maple-leaved checkerbloom	4.2	Broadleafed upland forest, coastal prairie, coastal scrub, north coast coniferous forest	Woodlands and clearings near coast; often in disturbed areas. 2-760m.	*Sidalcea malachroides* Maple-leaved checkerbloom

Special-Status Plant and Animal Species Considered but Rejected for Occurrence			
Scientific/Common Name	**Status**	**Habitat**	**Microhabitat**
Usnea longissima Methuselah's bear lichen	2.2	North coast coniferous forest, broadleafed upland forest	Grows in the "redwood zone" on a variety of trees including big leaf maple, oaks, ash, doug-fir, and bay. 0-2000' in CA.
Abronia umbellate ssp. *Breviflora* Pink sand-verbena	1B.1	Coastal dunes and coastal strand	Foredunes and interdunes with sparse cover. A Umb. Breviflora is usually the plant closest to the ocean. 0-12m

Astragalus pycnostachyus var. *pyncnostachyus* Coastal marsh milk-vetch	1B.2	Cismontane woodland, Lower montane coniferous forest/sometimes roadside	120-250m
Castilleja affinis ssp.litoralis *Oregon coast paintbrush*	2.2	Coastal bluff scrub, coastal dunes, coastal scrub	Sandy sites 15-100m
Gillia capitata ssp.*pacifica* Pacific gilia	1B.2	Coastal bluff scrub, coastal prairie, valley and foothill grassland	5-300m
Giilia millefoliata Dark-eyed gilia	1B.2	Coastal Dunes	2-20m
Glehnia littoralis ssp. *Leiocarpa* American glehnia	4.2	Coastal dunes	0-20m
Hesperevax sparsiflora var. *bervifolia* Short-leaved evax	2.2	Coastal bluff scrus, coastal dunes	Sandy bluffs and flats. 0-200m.
Lathyrus japonicas Seaside pea	2.1	Coastal dunes.	1-30m
Layia carnosa Beach layia	FE, SE, 1B.1	Coastal dunes. Hugely reduced in range alonf California's north coast dunes.	On sparsely vegetated semi-stabilized dunes, usually behind foredunes, 0-75m.
Mitella caulescens Leafy-stemmed miterwort	4.2	Broadleafed upland forest, lower montane coniferous forest, meadows and seeps, north coast coniferous forest	Mesic sites. 6-1710m.
Monotropa uniflora Ghost-pipe	2.2	Broadleaved upland forest, north coast coniferous forest	Often under redwoods or western hemlock. 10-200m
Montia howellii Howell's montia	2.2	Meadows, north coast coniferous forest, vernal pools	Vernally wet sites; often on compacted soil 0-400m
Sidalcea malviflora ssp. *Patula* Siskyou checkerbloom	1B.2	Coastal prairie, broadleafed upland forest	Open coastal forest. 15-65m

Lilium occidentale Western lily	FE, SE, 1B.1	Coastal scrub, freshwater marsh, bogs and fens, coastal bluff scrub, coastal prairie, no. Coast coniferous forest	Well-drained, old beach washes overlain w/ windblown alluvium & org. Topsoil; usu near margins of sitka spruce 2-185m
Carex leptalea Bristle-stalked sedge	2B.2	Bogs and fens, meadows, marshes and swamps	Mostly known from bogs and wet meadows. 0-790m.
Carex practicola Northern meadow sedge	2.2	Meadows	Moist to wet meadows
Lycopodium clavatum Running-pine	2.3	North coast coniferous forest, marshes and swamps	Forest understory; mesic sites with partial shade and light. 45-1640m.
Fissidens pauperculus Minute pocket moss	1B.2	North coast coniferous forest	Moss growing on damp soil along the coast. 10-100m
Noccaea fendleri ssp californica Kneeland prairie pennycress	FE, 1B.1	Broadleafed upland forest, coastal prairie	Serpentine rock outcrops. One occurrence known: 815m
Lathyrus palustris Marsh pea	2B.2	Bogs and fens, coastal prairie, coastal scrubc, lower montane coniferous forest, marshes and swamps, north coast coniferous forest	1-100m
Bryoria pseudocapillaris False Gray horsehair lichen	3.2	Coastal dunes (SLO County), North coast coniferous forest	Largest known population in CA is on Samoa Peninsula. 0-90m
Erysimum menziesii Menzies Wallflower	1B.1	Coastal dunes	0-35m
Oenothera wolfii Wolf's evening primrose	1B.1	Coastal bluff scrub, coastal dunes, coastal prairie, lower montane coniferous forest	3-800m
Packera bolanderi var. bolanderi Seacoast ragwort	2B.2	Coastal scrub, north coast coniferous forest	30-650m
cardamine angulata Seaside bittercress	2B.1	Wet areas, streambanks, lower montane coniferous forest, north coast coniferous forest	65-915m

[i] **Listing Designations:**

Federal and State:

FD = Federally delisted
FT = Federally threatened
FE= Federally Endangered
SE = California State Endangered
ST = California State Threatened
SR = California state-listed RARE
SC = California State Species of Concern

CNPS List Definitions

1A= Presumed extinct in CA
1B= Rare, threatened, or endangered in CA and elsewhere
2= Rare, threatened, or endangered in CA, but more common elsewhere
3 = Plants about which more information is needed
4 = Plants of limited distribution – a watch list

CNPS Threat Code Extensions

.1 = Seriously endangered in California (>80% of occurrences threatened/high immediate threat)
.2= Fairly endangered in California (20-80% occurrences threatened)
.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)