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Th11a

MEMORANDUM

Date: **July 8, 2016**

To: Commissioners and Interested Persons

From: Alison Dettmer, Deputy Director
Bob Merrill, District Manager
Cristin Kenyon, Coastal Program Analyst

Subject: **Addendum to Commission Meeting for Thursday, July 14, 2016**
North Coast District Item Th11a
CDP 1-16-0049 (Chevron)

This addendum presents certain revisions to the staff recommendation for approval of the project with conditions mailed on July 1, 2016. The revisions consist of changes to **Special Condition 2** and associated findings. The revisions were made in response to requests by the applicant (Chevron) after publication of the staff recommendation. The revisions relate to the timing of compliance with the requirement of Special Condition 2 for submittal of a copy of the incidental take permit from California Department of Fish and Wildlife (CDFW) for the take of the state-listed longfin smelt (*Spirinchus thaleichthys*). The addendum does not otherwise alter staff's recommendation of approval with conditions. The applicant agrees with the staff recommendation, and staff is recommending that the application be moved to, and then approved on, the Commission's consent calendar.

Text to be deleted is shown in ~~**bold strikethrough**~~, text to be added appears in **bold double-underline.**

Modifications to Special Conditions

- *Special Condition 2 on page 5 of the staff recommendation is modified as follows:*

2. California Department of Fish and Wildlife (CDFW) Incidental Take Permit. PRIOR TO **ANY PILE DRIVING WITH AN IMPACT HAMMER** ~~**ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-16-0049**~~, the applicant shall provide to the Executive Director a copy of the incidental take permit (ITP) issued by CDFW for the potential take of longfin smelt (*Spirinchus thaleichthys*). The applicant shall inform the Executive Director of any changes to the project required by CDFW,

including but not limited to, required changes that may conflict with modifications or conditions imposed by the Commission in approving Coastal Development Permit No. 1-16-0049. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

Reasons for recommended change: The applicant has requested this change to the timing of condition compliance for **Special Condition 2** to allow issuance of the CDP and commencement of construction before CDFW issues an incidental take permit (ITP) for the project. Chevron is mandated by the State Lands Commission to seismically retrofit the Chevron Eureka Terminal dock to bring the dock into compliance with state marine oil terminal standards by 2017. The first phase of the project, the wharf unloading platform retrofit, must be completed this year during a limited seasonal in-water construction window that ends October 15th. Chevron is concerned about completing work within the limited construction window during the first year of construction if there are any delays in issuance of the CDP and commencement of construction.

The incidental take permit is required because of potential take of longfin smelt resulting from the acoustic impacts associated with the possible use of an impact hammer for pile driving. Chevron and CDFW staff are in agreement on the type, amount, and location of mitigation for the potential take of longfin smelt (outlined in Special Condition 9D of the CDP), but CDFW has not yet issued an ITP. Because the ITP is not needed for the overall project but only if impact pile driving occurs and exceeds the 183 dB accumulated sound exposure level threshold, Commission staff believes it is acceptable to modify Special Condition 2 to require evidence of the ITP prior to pile driving with an impact hammer when the impact would occur rather than prior to issuance of the CDP.

It is important to note that the applicant proposes and Special Condition 9 of the CDP requires the use of a vibratory hammer rather than an impact hammer to install new piles. An impact hammer pile driver can only be used if and when the vibratory hammer is unsuccessful in driving a pile to the required depth into the substrate. According to a geotechnical assessment performed for the retrofit project, the proposed steel piles will likely be able to be driven with a vibratory hammer to the design depths with minimal chance of early refusal based on substrate conditions encountered at the subject site. Therefore, there is a possibility that driving with an impact hammer will not occur and no ITP will be necessary. Chevron nevertheless has applied for an ITP to ensure that the project will not suffer delays if in fact impact pile driving proves to be necessary.

Modifications to Findings

- *On page 16 of the staff recommendation, the section titled "California Department of Fish and Wildlife (CDFW)" under Finding D, "Other Agency Approvals," shall be modified as follows:*

California Department of Fish and Wildlife (CDFW)

CDFW, in its administration of the California Endangered Species Act (CESA), requires an Incidental Take Permit (ITP) for "take" of listed species incidental to otherwise lawful development projects. The applicant consulted with CDFW on the project and CDFW determined that a take permit is necessary for longfin smelt (*Spirinchus thaleichthys*) as there is reasonable potential for take of this species. To ensure that the project (including mitigation for potential impacts to longfin smelt) ultimately approved by CDFW is the same as the project authorized herein, the Commission attaches **Special Condition 2**, which requires the applicant to submit to the Executive Director a copy of the ITP issued by CDFW prior to ~~**issuance of the CDP**~~ **any pile driving with an impact hammer. The anticipated cause of any take of longfin smelt would be acoustic impacts from pile driving with an impact hammer**. The condition **further** requires that any project changes resulting from CDFW's ITP approval not be incorporated into the project until the applicant obtains any necessary amendments to this CDP.

Reasons for recommended changes: The changes to the findings reflect the change to Special Condition 2 described above.

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Th11a

Filed:	6/25/16
180th day:	12/22/16
Staff:	C. Kenyon-A
Staff Report:	7/01/16
Hearing Date:	7/14/16

STAFF REPORT: REGULAR CALENDAR

Application No.:	**1-16-0049**
Applicant:	**Chevron**
Agent:	Pacific Affiliates, Inc.
Location:	Chevron Eureka Terminal Dock, along the eastern shore of Humboldt Bay, on tidelands adjacent to 3400 Christie Street, Eureka, Humboldt County (APN 007-071-13 & 007-071-08).
Project Description:	Perform a seismic retrofit of the dock at the Chevron Eureka Terminal including the removal of the existing timber-based structural support system for the dock's fuel pipelines, the installation of a new steel support structure, and the installation of a new fuel unloading platform.
Staff Recommendation:	Approval with conditions.

SUMMARY OF STAFF RECOMMENDATION

Chevron is proposing to perform a seismic retrofit of the Chevron Eureka Terminal Dock located on the eastern shore of Humboldt Bay in southern Eureka. The dock supports a fuel unloading platform and a system of pipelines that are used for the conveyance of gasoline and diesel fuel from oceangoing barges to the terminal's upland bulk storage facility. The proposed retrofit will involve the installation of large diameter steel piles to support the fuel unloading platform and

pipelines, isolating the oil transfer system from the timber dock structure in order to provide a more stable foundation to prevent product spills during a seismic event. Once the retrofit is completed, the timber dock structure will be able to collapse without compromising the stability of the new oil transfer supporting structure.

The proposed fill to seismically retrofit an existing marine shipping terminal is an allowable use for fill in coastal waters under Section 30233(a)(1) of the Coastal Act, which allows fill for port, energy, and coastal dependent industrial facilities. Though there is no less environmentally damaging feasible alternative to the proposed project as it is recommended to be conditioned, project construction could have a number of potential adverse effects on the environment of Humboldt Bay, including acoustic impacts of pile driving on fish and marine mammals, disturbance of eelgrass habitat, and degradation of water quality.

To ensure that fish and marine mammals are not exposed to sound levels that could cause them injury during pile installation, Chevron has submitted an Underwater Noise and Marine Mammal Monitoring Plan. Chevron will mitigate for potential direct impacts to longfin smelt by removing fill to the north of the trestle to create habitat for the fish species. Staff has included **Special Conditions 5 & 9** requiring the implementation of various mitigation measures for acoustic impacts including implementation of the proposed acoustic monitoring measures and longfin smelt habitat creation as well as imposing work window and pile driving limits.

Given that native eelgrass (*Zostera marina*) grows in the project area around the dock's trestle, Chevron has submitted an Eelgrass Mitigation and Monitoring Plan and staff has included **Special Conditions 10 & 11** to require implementation of the plan for minimizing, monitoring and mitigating potential disturbance to eelgrass habitat.

To prevent water quality impacts, staff has included **Special Condition 7** requiring that a number of Best Management Practices (BMPs) be implemented during construction to contain debris and prevent leaks or spills of hazardous materials into bay waters. In the event that an accidental oil spill does occur, staff recommends **Special Condition 8** requiring adherence to Chevron Eureka Terminal's OPA-90 Facility Response Plan and project-specific Spill Response Plan.

Staff believes that the proposed project, as conditioned, is consistent with all applicable Chapter 3 policies of the Coastal Act. The motion to adopt the staff recommendation of **approval** of Coastal Development Permit (CDP) 1-16-0049 with special conditions is found on **page 4**.

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APPENDICES

EXHIBITS

I. MOTION AND RESOLUTION

The staff recommends that the Commission adopt the following resolution:

Motion:

I move that the Commission approve coastal development permit 1-16-0049 pursuant to the staff recommendation.

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS

This permit is granted subject to the following standard conditions:

1. **Notice of Receipt and Acknowledgment**: The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration**: If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.

3. **Interpretation**: Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.

4. **Assignment**: The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. **Terms and Conditions Run with the Land**: These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS

This permit is granted subject to the following special conditions:

1. North Coast Regional Water Quality Control Board Approval. PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION, the permittee shall provide to the Executive Director a copy of a permit issued by the North Coast Regional Water Quality Control Board (Regional Board), or letter of permission, or evidence that no permit or permission is required. The permittee shall inform the Executive Director of any changes to the project required by the Regional Board. Such changes shall not be incorporated into the project until the permittee obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

2. California Department of Fish and Wildlife (CDFW) Incidental Take Permit. PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-16-0049, the applicant shall provide to the Executive Director a copy of the incidental take permit (ITP) issued by CDFW for the potential take of longfin smelt (*Spirinchus thaleichthys*). The applicant shall inform the Executive Director of any changes to the project required by CDFW, including but not limited to, required changes that may conflict with modifications or conditions imposed by the Commission in approving Coastal Development Permit No. 1-16-0049. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

3. U.S. Army Corps of Engineers Approval. PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION, the permittee shall provide to the Executive Director a copy of a permit issued by the Army Corps of Engineers, or letter of permission, or evidence that no permit or permission is required. The permittee shall inform the Executive Director of any changes to the project required by the Army Corps of Engineers. Such changes shall not be incorporated into the project until the permittee obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

4. National Marine Fisheries Service Consultation Results. PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-16-0049, the applicant shall provide to the Executive Director a copy of the informal consultation, letter of concurrence, biological opinion or other documentation issued by the National Marine Fisheries Service (NOAA Fisheries) regarding their assessment of the potential effects of the development on fish and wildlife species subject to protections of the Endangered Species Act, the Marine Mammals Protection Act, the Magnuson-Stevens Fishery Conservation and Management Act, and all other applicable natural resources law. The applicant shall inform the Executive Director of

any changes to the project required by NOAA Fisheries, including but not limited to, required changes that may conflict with modifications or conditions imposed by the Commission in approving Coastal Development Permit No. 1-16-0049. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

5. **Timing of In-Water Construction.** Consistent with the project proposal, in-water construction activities authorized by this permit shall be conducted only during the period of July 1st through October 15th to minimize conflicts with migrating salmonids.

6. **Pile Removal.** The permittee shall remove timber piles proposed for removal in their entirety. Piles that cannot be removed in their entirety shall be cut off at least one foot below the level of the mudline.

7. **Construction Responsibilities.** Construction-related requirements shall include, but shall not be limited to, the following Best Management Practices:
   A. To the maximum extent feasible, the permittee shall prevent debris from entering the water. Debris held on the barge or dock shall be contained at all times, and covered with plastic sheeting during high winds and/or precipitation.
   B. Floating containment booms shall be deployed around the area under construction to contain any debris that does enter coastal waters, and any debris discharged shall be removed as soon as possible but no later than the end of each day.
   C. Cutting, drilling, coating, welding, concrete pouring, and other construction activities shall occur on land away from coastal waters to the maximum extent feasible.
   D. For work that must occur on site on and over tidelands of Humboldt Bay, catchments designed for the specific task at hand (e.g. tarps, catch trays, etc.) shall be used where feasible to capture debris before it enters coastal waters.
   E. The procedures outlined in the American Wood Protection Association (AWPA)'s Standard M4, Standard for the Care of Preservative-Treated Wood Products, shall be followed when applying preservative to the cut ends of treated wood. The topical preservative shall not be applied during rain and a drip tray shall be used to capture any potential spills or drips.
   F. Welding shall only occur when winds are 5 mph or less. A modified catch basin shall be used during welding to capture slag and welding rod butts, thus preventing welding waste from entering Humboldt Bay.
   G. Cement shall be prepared and poured in a manner that will prevent discharges of wet cement into coastal waters including, but not limited to, placement of barriers around the construction area to prevent spills or over-pours from entering coastal waters.
   H. Rinsate from the cleaning of cement mixing equipment shall be contained and handled only in upland areas located a minimum of 100 feet from the high tide line, and otherwise outside of any environmentally sensitive habitat area.
   I. No materials removed from the dock or debris generated during the project shall be allowed to rest on the bay substrate, and all materials shall be held in a containment area on the barge until transferred to the staging area (Humboldt Bay Forest Product

Dock in Fields Landing), where they shall be placed on a liner, cut to size, loaded in water-tight containers, and hauled offsite to an authorized disposal facility. Existing creosote-treated or ACZA-treated piles to be removed shall be disposed of at a landfill authorized to accept such chemically treated waste.

J. Construction equipment shall be fueled, maintained, and washed in confined areas specifically designed to control runoff and located more than 100 feet away from the mean high tide line.

K. No fuels, lubricants, or solvents shall be allowed to enter coastal waters. All equipment shall be inspected for leaks prior to commencing work. Spill containment trays shall be placed around the welders, generators, air compressor, crane, and any other equipment on the barge deck. A ten foot setback from the edge of the barge deck shall be maintained when handling fluids and equipment on the barge.

L. The vibratory hammer used during construction shall rely on biodegradable hydraulic fluid rather than typical petroleum based hydraulic fluid.

8. Development in Accordance with Spill Prevention and Response Plans. The permittee shall adhere to the oil spill prevention and response measures contained within (a) the most up-to-date version of the OPA-90 Facility Response Plan for the Eureka Chevron Terminal prepared by Technical Response Planning and approved by the United States Coast Guard and (b) the project-specific Spill Response Plan for the Chevron dock seismic retrofit project prepared by West Coast Contractors, Inc. and submitted to Coastal Commission staff on June 8, 2016. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission approved amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

9. Pile Driving Limitations.

A. New piles to be installed shall be limited to four 24-inch-diameter steel piles and 20 16-inch-diameter steel piles.

B. All pile-driving activities shall be performed in full accordance with the following avoidance and minimization measures:

i. All pile driving shall occur only during the period of July 1st through October 15th, pursuant to **Special Condition 5** above.

ii. Piles shall be driven first with a vibratory hammer; an impact hammer may be used only if refusal is reached with the vibratory hammer prior to the pile reaching its required tip depth as specified in Plan Sheet S-24 attached as **Exhibit 5, page 10**.

iii. A cushion block shall be employed between the impact hammer and piles during all in-water impact pile driving to dampen underwater noise generated by hammer strikes.

iv. A bubble curtain consisting of a stacked series of bubble extruder rings shall be used around piles during all in-water impact pile driving to reduce the transmission of sound through the water. Impact pile driving shall avoid times of rapid tidal velocities to prevent the dispersal of bubbles.

v. All impact-pile-driving activities shall incorporate a "soft start" approach whereby hammer strikes on each pile begin at low pressure and slowly increase to full hammer strength in order to frighten fish and marine mammals away from the piles before the acoustics generated by pile driving approach levels that could cause injury.

C. All pile-driving activities shall be performed in full accordance with the following sound limitation provisions and monitoring and reporting measures:

i. To protect listed fish (excepting those under 2 grams) from the acoustic impacts of pile driving, peak sound pressure levels (SPL) generated by the project shall not exceed 206 dB and accumulated sound exposure levels (SEL) shall not exceed 187 dB.

ii. Real-time hydroacoustic monitoring of peak SPL and accumulated SEL shall be performed continuously during all in-water impact pile driving consistent with the methods detailed in the underwater acoustic monitoring plan titled, "Underwater Noise and Marine Mammal Monitoring Plan," dated April 29, 2016, and prepared by H.T. Harvey & Associates (**Exhibit 6**) to ensure that sound levels remain below peak (206 dB) and accumulated (187 dB) underwater noise thresholds.

iii. Impact hammer driving shall immediately cease for at least 12 hours if the accumulated SEL reaches 186.5 dB at 10 meters from the pile being driven.

iv. In the event of an exceedance of either criterion of the dual metric exposure criteria (206 dB peak SPL or 187 dB accumulated SEL), (a) pile-driving operations shall immediately cease; (b) the event shall be immediately reported to the Executive Director; and (c) pile-driving operations shall not recommence unless the Executive Director, in consultation with the fisheries biologists of the California Department of Fish & Wildlife and the National Marine Fisheries Service, so authorizes based on the resumption of hydroacoustic monitoring of all pile-driving operations and the deployment of additional sound attenuation measures or other measures deemed likely by qualified technical experts to return the pile driving to conformance with the dual metric exposure criteria.

v. If the return to pile driving after the implementation of the additional measures discussed in Subparagraph (iv) above results in an exceedance of either criterion of the dual metric exposure criteria, pile driving shall be stopped immediately and shall not re-commence until or unless the Commission approves an amendment to CDP 1-16-0049 that proposes changes to the project offer a high likelihood of success in preventing further exceedance of the dual metric exposure criteria.

vi. A report describing hydroacoustic monitoring results of any in-water impact pile driving that occurs during Phase 1 of the project shall be submitted to the Executive Director within 90 days of completion of the Phase 1 hydroacoustic monitoring.

vii. A final report that includes data collected and summarized from all Phase 1 and Phase 2 monitoring locations and times shall be submitted to the Executive Director within 90 days of completion of the hydroacoustic monitoring. The final report shall include all the information listed on pg. 12 of the report titled,

"Underwater Noise and Marine Mammal Monitoring Plan," dated April 29, 2016, and prepared by H.T. Harvey & Associates (**Exhibit 6**).

D. The permittee shall perform mitigation for potential exceedance of an accumulated sound exposure level of 183 dB and resulting impacts to fish that are less than 2 grams in weight, including juvenile longfin smelt (*Spirinchus thaleichthys*), by removing an approximately 105.3-square-foot derelict piling and dolphin directly north of the Chevron dock's trestle as proposed by the applicant (**Exhibit 8**).

i. The permittee shall remove the debris adjacent to the trestle prior to completion of the terminal retrofit project during the August 1st – October 15th work window, consistent with the limitations and responsibilities outlined in the special conditions of this permit.

ii. During the debris removal, the barge shall anchor in an area that is too deep to support eelgrass, avoiding potential spud pole impacts to eelgrass.

iii. Within 30 days of removal of the derelict structure, documentation shall be provided to the Executive Director that the structure was removed in its entirety in accordance with the conditions of this coastal development permit.

E. To insure injury does not occur to marine mammals, the hydroacoustic monitoring required under Subparagraph (C) above shall be used to determine the distance from pile driving at which underwater peak sound levels caused by pile driving reach 180 dB. If this sound level is reached, then a shut-down zone equal to that distance shall be established around each pile being driven and pile-driving operations shall be shut down if a marine mammal is within that zone. If a shut-down zone needs to be established because sound levels caused by pile driving reach 180 dB, then a qualified biological monitor shall be present throughout all pile-driving activities for the duration of the project to visually search for marine mammals in the shut-down zone 30 minutes prior to and continuously throughout periods of impact pile-driving activities and to alert equipment operators as needed. If any marine mammal is about to enter or is observed within the shutdown zone at these times, the operator will delay or shut down pile-driving activities until the animal has moved outside the shutdown zone.

F. Pile driving shall be conducted at all times in accordance with these provisions. Any proposed changes to these pile-driving requirements and limitations shall be reported to the Executive Director. No changes to the requirements of the special condition shall be made without a Coastal Commission approved amendment of CDP 1-16-0049 unless the Executive Director determines that no amendment is legally required.

10. Construction Access Restrictions.

A. The area of permissible substrate disturbance from the construction barge shall be limited to the placement of two 28-inch-diameter spud poles per barge work location; no chains or other materials shall be dragged on the substrate surface. To the maximum extent feasible, barge anchors shall be deployed in areas of mudflat devoid of eelgrass. When not in use, the barge shall be moored in deep water, away from potential eelgrass habitat.

B. All construction activities performed from the construction barge in shallow waters shall be conducted during periods of high-tides only to prevent grounding of the barge

on mudflat or eelgrass habitat. The distance between the bottom of the barge and the ground shall be monitored continuously when the barge is in shallow water and a tide of at least five feet above mean lower low water (MLLW) shall be required to ensure there is enough water to clear the five foot loaded draft depth of the barge. The barge shall be moved to deeper water when necessary to ensure that there is enough water to clear the five foot loaded draft depth of the barge and the barge does not rest on the bay bottom. If the barge inadvertently grounds, the Executive Director shall be alerted within 24 hours. Areas impacted shall be photo-documented, and the area of substrate disturbance shall be measured as soon as possible following the accident to assist in the determination of the amount of compensatory mitigation required.

11. Eelgrass Monitoring, Mitigation, and Reporting Requirements.

A. Eelgrass monitoring shall comply with the applicant's "Chevron Eureka Terminal Seismic Retrofit Project: Eelgrass Mitigation and Monitoring Plan," dated April 28, 2016, and prepared by H.T. Harvey & Associates (**Exhibit 7**), including, but not limited to, the following requirements:

i. A pre-construction growing season survey shall be completed during the active growth period for eelgrass (May through September) prior to each year of construction during which work is performed that may impact eelgrass habitat. If construction work does not commence within 60 days of completion of the pre-construction growing season survey, a new pre-construction survey shall be completed and submitted to the Executive Director prior to the commencement of construction.

ii. During construction, georeferenced and time-stamped photographs shall be taken showing the locations where barge spud pole anchoring occurs and where piles are placed and removed.

iii. A qualified biologist shall be present on-site while work is being performed in areas that may impact eelgrass habitat to help monitor and avoid impacts to eelgrass. Among other duties, the biological monitor shall: (1) ensure piles that are removed are placed in a containment area on the barge and not allowed to rest on the substrate surface; (2) document the number of times the barge is repositioned and georeference barge spud pole placements; (3) take time-stamped photographs of all locations where barge spud poles are anchored and where piles are installed and removed; and (4) document the timing and location of substrate disturbance if unexpected actions such as propeller scarring or barge grounding negatively affect eelgrass.

iv. Post-construction georeferenced photographs shall be taken as soon as feasible following construction each year that work is performed that may impact eelgrass habitat to document the extent of substrate disturbance caused by pile installation, pile removal, spud pole placement, propeller action, and any other construction-related activities.

v. For each year that work is performed that may impact eelgrass habitat, a post-construction growing season survey shall be completed in the same month as the pre-construction survey during the following growing season (May through September).

vi. Each time a growing season survey is conducted, eelgrass spatial distribution, aerial extent, percent vegetated cover, and turion density shall be sampled within one 33-foot-wide strip directly south of the trestle where piles will be removed and installed, and within one 115-foot-wide strip 33-148 feet south of the trestle where the barge will be operating during construction. The same eelgrass parameters shall also be sampled and characterized at the selected reference site located 246-279 feet south of the trestle to help determine whether changes in eelgrass characteristics are attributable to natural variability or project actions. Monitoring shall be performed consistent with the methods detailed in the Eelgrass Mitigation and Monitoring Plan dated April 28, 2016, and prepared by H.T. Harvey & Associates.

B. Eelgrass mitigation shall comply with the following requirements:

i. For each year that work is performed that may impact eelgrass habitat, the need for compensatory mitigation shall be determined the following growing season following the post-construction field assessment based on the protocols contained in the Eelgrass Mitigation and Monitoring Plan dated April 28, 2016, and prepared by H.T. Harvey & Associates. Impacts shall be assessed and quantified consistent with the methods detailed in the plan. Compensatory mitigation shall be performed within one year of determination of impacts.

ii. During project construction, the permittee shall remove 25 14-inch diameter timber trestle piles from eelgrass habitat and 46 14-inch diameter timber piles from locations in deep water. The permittee shall remove timber piles during the July 1st – October 15th work window, consistent with the limitations and responsibilities outlined in the special conditions of this permit. The removal of piles from eelgrass habitat shall constitute in-kind mitigation receiving a 1.2:1 eelgrass mitigation to eelgrass impact ratio credit, while the removal of piles outside of eelgrass habitat shall constitute out-of-kind mitigation receiving a 2:1 eelgrass mitigation to eelgrass impact ratio credit. The permittee shall compensate for the loss of 20.9 square feet of eelgrass habitat from the installation of 15 steel piles in eelgrass habitat and the loss of 19.6 square feet of bay mud habitat from the installation of 9 steel piles in bay mud devoid of eelgrass. The permittee shall utilize the remaining 16.37 square feet of additional mitigation for any addition impacts. If unanticipated impacts occur in excess of 16.37 square feet, then an extended eelgrass mitigation and monitoring plan shall be prepared and submitted as an application for an amendment to CDP 1-16-0049. The permittee shall perform in-kind compensatory mitigation for all additional impacts at a 1.2:1 ratio within one year of the determination of impacts by removing marine debris in nearby eelgrass habitat.

C. Eelgrass reporting shall comply with the following requirements:

i. A monitoring report shall be provided to the Coastal Commission within 90 days of completion of the post-construction growing season survey. This monitoring report shall include pre- and post-construction growing season survey results including eelgrass maps and information on the spatial distribution, areal extent, percent cover, and turion density of eelgrass at the project and reference sites within defined survey areas. The report shall also include: (1) a summary of

work operations, including the dates work was performed in eelgrass habitat, the number of times the barge was moved, and the location of spud pole placements; (2) photo-documentation of pre- and post-construction site conditions, and areas of substrate disturbance; (3) an impact analysis, including a quantitative assessment of any impacts on eelgrass that may have occurred as a result of project actions; and (4) a calculation of the area required for compensatory mitigation if needed and a description of how mitigation requirements have or will be met. Survey results shall be submitted for the review and written approval of the Executive Director.

D. Eelgrass monitoring, mitigation, and reporting shall be conducted at all times in accordance with these provisions. Any proposed changes to these eelgrass monitoring, mitigation, and reporting requirements shall be reported to the Executive Director. No changes to the requirements of the special condition shall be made without a Coastal Commission approved amendment of CDP 1-16-0049 unless the Executive Director determines that no amendment is legally required.

12. **Assumption of Risk, Waiver of Liability and Indemnity.** By acceptance of this permit, the applicant acknowledges and agrees (i) that the site may be subject to hazards, including but not limited to waves, storm surges, earthquakes, liquefaction, and tsunamis; (ii) to assume the risks to the permittee and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development; (iii) to unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and (iv) to indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards.

IV. FINDINGS AND DECLARATIONS

The Commission hereby finds and declares as follows:

A. PROJECT DESCRIPTION

Chevron is proposing to perform a seismic retrofit of Chevron Eureka Terminal Dock, located along the eastern shore of Humboldt Bay on tidelands adjacent to 3400 Christie Street, Eureka, Humboldt County (**Exhibits 1 & 2)**. Approximately once every two weeks, a fuel barge berths at the wharf's unloading platform and gasoline and diesel fuels are transferred via the pipeway along the trestle to the terminal's landside bulk fuel storage facility. The facility supplies approximately 75% of the fuel used by consumers in the greater Eureka area. The existing dock is a T-shaped timber structure with a 594-foot-long trestle extending from the shoreline out to a 152-foot-long wharfhead (**Exhibit 3**). The trestle consists of a 10-ft-wide roadway and 9-ft-wide pipeway supporting five pipelines. The wharfhead at the end of the trestle supports a contained unloading platform area and an operator's shack.

The existing timber dock structure is inadequate to support the fuel conveyance facilities during a significant seismic event. The proposed retrofit involves installing a new steel support structure

for the unloading platform and pipeway and a new prefabricated concrete unloading platform. The new steel support structure would isolate the unloading platform and pipeway from the timber dock and provide a more stable foundation to prevent product spills in the event of an earthquake.

Construction Timing
The proposed project would be divided into two phases scheduled to take place over the course of two years. Phase 1 would include the retrofit of the wharf unloading platform and replacement of the two western-most trestle bays. Phase 2 would consist of the retrofit of the trestle pipeway. All underwater work is proposed to be conducted within a work window extending from July 1st to October 15th of each year to minimize disturbance to threatened migratory salmonids.

Phase 1 - Wharf Unloading Platform Retrofit
Portions of the wharf's stringers and decking would first be removed to provide an opening for the driving of four new 24-inch-diameter steel pipe piles. Framing would be added as necessary to transfer loads, and markers and barriers would be installed to limit access near the openings. The four steel piles would then be installed and cut to design elevation, and a pile cap plate would be welded on top of the piles. Next, in preparation for the installation of the new unloading platform on top of the four new steel piles, Chevron would remove a portion of the fuel pipelines; demolish the existing unloading platform; remove approximately 1,300 square feet of the existing wharf including decking, stringers, and pile caps; and remove 31 existing timber piles. The extensive demolition would require the facility to shut down (i.e. not take any barge calls) for a two to three week window.[1] The new 31.5-foot-by-37.5-foot concrete unloading platform would be fabricated offsite and delivered via barge, which would float the structure into place at high tide. The platform would be welded to the new pile cap plate so that it would be supported by the four new steel piles. The new unloading platform would nominally cover the removed area of the wharf, but would be isolated from the existing wharf with access by three ramps to the existing wharf structure. Once the access ramps are installed, the oil product piping and primary containment basin that were removed during facility shutdown would be reinstalled, and temporary fire lines and utility lines would be installed as necessary. After the facility returns to operations, permanent fire lines would be installed along with vehicle barriers, permanent guard rails along the cut edge of the existing wharf, and blocking at the exposed edges of the stringers along the cut edge of the existing wharf. See **Exhibit 5**, pages 7-9 for relevant project plans.

Phase 2 - Trestle Pipeway Retrofit
The existing support system for the trestle consists of 34 timber bents spaced approximately every 20 feet that support a ten-foot-wide roadway and nine-foot-wide pipeway. The proposed trestle retrofit would consist of underpinning the pipeway with a new steel support system, then isolating the pipeway from the roadway. First, twenty 16-inch-diameter steel pipe piles (two of which would be installed during Phase I of the project) would be installed along the south side of the trestle every 30 feet. The new piles would be cut to elevation and pile cone caps would be added. Next, a diagonal brace would be welded to each pile that would be used to support a new steel beam that would extend from each pile and underpin the pipeway. Teflon sliding plates or saddles would be inserted to support the piping and allow it to move longitudinally and be restrained transversely with tab plates on the beam. An aramid cable system would be installed along the pipeway to provide continuity between the new piles. Once the pipeway is underpinned, the

[1] Existing non-load bearing batter and fender piles may be removed prior to facility shutdown.

existing timber pile caps and 41 existing timber piles would be removed below the pipeway to isolate the pipeway from the timber dock structure. Because the trestle retrofit is an underpinning installation and would not require the removal of existing piping, the facility would not shut-down during the trestle retrofit, although construction would halt during barge fuel deliveries (approximately every two weeks) so that the pipelines would not be transferring fuel at the time of construction. See **Exhibit 5**, pages 2-6 for relevant project plans.

Construction Methods and Access

Construction would be performed primarily from a floating barge. The barge would be maneuvered with a small tug boat, and occasionally a small skiff would be used as a bow thruster. The barge would be anchored at each work location by two spud poles. A crane positioned on the barge would be used to remove and install elements of the dock. When work would be required in shallow intertidal waters, the work would take place during high tides only to allow the barge to float at least one foot above the bay bottom. For work on the dock bents closest to the shore, the barge would not be utilized and instead work would be performed by positioning the crane on land at the foot of the dock. Work from land would be performed at low tide when there is no water under the subject dock bents to minimize impacts to aquatic organisms.

New steel piles would be driven by vibratory hammer until refusal or tip elevation is reached. The four 24-inch-diameter steel piles proposed for the wharf retrofit would be driven to a tip elevation of approximately -76 feet mean lower low water (MLLW), while the 20 16-inch-diameter steel piles proposed for the trestle retrofit would be driven to a tip elevation of -36.5 feet to -56.5 feet MLLW, depending on the depth of the mudline at their locations along the pipeway. If refusal occurs with the vibratory hammer before the tip elevation is reached, an impact hammer could be used to finish driving the subject piles.

A total of 71 existing treated timber piles would be removed as part of this project using a variety of methods. Existing timber piles to be removed from underneath the pipeway that are located in intertidal areas will be cut four-fifths of the way through by a chainsaw during low tides when they are exposed at the mudline. During the following high tide, the cut piles would be rigged to both a crane and a winch on the construction barge to break them off at the cut line. The winch would keep a lateral pull on the piles as they are being pulled laterally and upward with the crane to prevent the piles from falling back towards the pipeway. Piles in deep water areas that can be accessed by the vibratory hammer would be vibrated out with the hammer with a timber clamp attachment. If piles are encountered that cannot be removed with these two methods, they would be pulled laterally with a crane until they break. When being pulled laterally with the crane, the piles would be hooked to a tail-hold line on the barge which would be used to keep the piles from whiplashing back towards the pipeway.

All materials removed from the dock and debris generated during the project would be held in a containment area on the barge until transferred to the staging area at Humboldt Bay Forest Product's dock (50 C Street, Fields Landing, Humboldt County), where they would be placed in water-tight containers (**Exhibit 4**). When the containers become full, they would be transported to a landfill in Anderson, California capable of accepting creosote-treated wood.

B. PROJECT BACKGROUND AND SETTING

The Chevron Eureka Terminal is located in southern Eureka directly west of the Bayshore Mall and approximately 2,500 feet north of the mouth of the Elk River (**Exhibits 1-2**). The terminal is a port facility used for off-loading petroleum products from oceangoing barges to storage tanks on shore for later distribution by truck to customers throughout the north coast. Approximately 75% of the fuel used by the greater Eureka area is delivered via barge to the Chevron Terminal. The terminal consists of a timber dock situated on tidelands of Humboldt Bay and a bulk fuel storage facility on the adjacent upland parcel. The tidelands parcel where the dock is located has been granted by the California State Lands Commission to the City of Eureka and leased to Chevron (APN 007-071-13). The uplands parcel is owned by Chevron USA, Inc. (APN 007-071-08).

The proposed seismic retrofit of the Chevron Eureka Terminal Dock is a compliance driven project required by the California State Lands Commission (CSLC) per California Building Code Chapter 31F, Marine Oil Terminals. A seismic evaluation report conducted in 2014 by the structural engineering consultant Moffatt and Nichol determined that the existing timber dock structure will experience catastrophic failure during the considered seismic events.

The Chevron dock was originally constructed in the early 1900s and has since been repaired, upgraded, and expanded numerous times. Construction of the trestle and wharf are typical of a timber structure. Wood pilings driven in rows are connected with a 12x12-inch timber cap. Stringers span between piling caps and are covered with 4x12-inch decking. Most of the 472 timber piles that currently support the dock are creosote-treated, although piles that have been added since the 1990s are treated with ammoniacal copper zinc arsenate (ACZA) preservative. Most recently, 23 new ACZA pressure-treated wood piles with polyurea coating were installed in 2014 and 2015 under Coastal Development Permit (CDP) Waiver 1-14-1587-W and CDP 1-14-0773.

The dock extends westward from the shore through shallow intertidal areas to the margin of the dredged North Bay Channel. The shoreline to the east of the dock is a sloped, sandy beach with large boulder riprap. The lower end of the beach transitions into a soft, fine-grained mudflat formed by the deposition of sediments from the nearby confluence of the Elk River and Humboldt Bay. The mudflat supports native eelgrass (*Zostera marina*) which grows in patches near the riprap shoreline and forms a dense, continuous bed at greater depth further out in bay waters on either side of the trestle. Dense macroalgae, primarily sheet *Ulva* sp., grows with the eelgrass in the mid to high regions of the mudflat out to approximately 400 feet from the shoreline. The deepwater regions around the end of the trestle (past Bent 24) and the wharf are too deep to support eelgrass. Water depths at the wharf in the area of the proposed unloading platform retrofit are approximately -20 to -25 feet MLLW.

C. STANDARD OF REVIEW

The proposed dock seismic retrofit project is located entirely on tidelands and submerged lands over which the state retains a public trust interest. Therefore, the site is within the Commission's area of retained jurisdiction, and the standard of review that the Commission must apply to the development is the Chapter 3 policies of the Coastal Act.

D. OTHER AGENCY APPROVALS

City of Eureka
The project is located on tidelands and submerged lands that were legislatively granted to the City of Eureka by the State of California. The City, as lessor of the tidelands and submerged lands in the project area, has granted a lease to the applicant for use of the property. The City has no other discretionary permit requirements for this project.

Humboldt Bay Harbor, Recreation, and Conservation District
The Harbor District is a county-wide agency with permit jurisdiction over all the tidelands and submerged lands of Humboldt Bay. On June 23, 2016, the Harbor District adopted a Mitigated Negative Declaration and issued Permit No. 16-02 for the dock retrofit project.

North Coast Regional Water Quality Control Board
The Regional Board requires a water quality certification (WQC) for projects involving dredging and/or filling activities under Section 401 of the Clean Water Act. To ensure that the project ultimately approved by the Regional Board is the same as the project authorized herein, the Commission attaches **Special Condition 1**, which requires the permittee to submit to the Executive Director evidence of the Regional Board's approval of the project prior to the commencement of construction activities. The condition requires that any project changes resulting from the Regional Board's approval not be incorporated into the project until the permittee obtains any necessary amendments to this CDP.

California Department of Fish and Wildlife (CDFW)
CDFW, in its administration of the California Endangered Species Act (CESA), requires an Incidental Take Permit (ITP) for "take" of listed species incidental to otherwise lawful development projects. The applicant consulted with CDFW on the project and CDFW determined that a take permit is necessary for longfin smelt (*Spirinchus thaleichthys*) as there is reasonable potential for take of this species. To ensure that the project (including mitigation for potential impacts to longfin smelt) ultimately approved by CDFW is the same as the project authorized herein, the Commission attaches **Special Condition 2**, which requires the applicant to submit to the Executive Director a copy of the ITP issued by CDFW prior to issuance of the CDP. The condition requires that any project changes resulting from CDFW's ITP approval not be incorporated into the project until the applicant obtains any necessary amendments to this CDP.

U.S. Army Corps of Engineers
The Army Corps has regulatory authority over the proposed project under Section 10 of the Rivers and Harbors Act of 1899 (*33 U.S.C. 1344*) which regulates the diking, filling, and placement of structures in navigable waterways, and Section 404 of the Clean Water Act which regulates the discharge of dredged or fill material in waters of the United States. To ensure that the project ultimately approved by the Army Corps is the same as the project authorized herein, the Commission attaches **Special Condition 3**, which requires the permittee to submit to the Executive Director evidence of the Army Corps' approval of the project prior to the commencement of construction activities. The condition requires that any project changes

resulting from the Army Corps' approval not be incorporated into the project until the permittee obtains any necessary amendments to this CDP.

National Marine Fisheries Service
Pursuant to Section 7(a) of the Endangered Species Act of 1973, as amended (U.S.C. Sec 1531 et seq.), the Army Corps initiated consultation with the National Marine Fisheries Service (NOAA Fisheries) on June 20, 2016 requesting their concurrence that the proposed project is not likely to adversely affect listed species, including Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), California Coastal (CC) Chinook salmon (*O. tshawytscha*), Northern California (NC) steelhead (*O. mykiss*), North American green sturgeon (*Acipenser medirostris*) and designated critical habitat for these species. The Commission attaches **Special Condition 4** requiring the applicant to submit to the Executive Director a copy of the NOAA Fisheries concurrence letter prior to issuance of the CDP. The condition requires that any project changes required by NOAA Fisheries not be incorporated into the project until the applicant obtains any necessary amendments to this CDP.

California State Lands Commission
There are approximately 35 marine oil terminals in California where approximately 2 million barrels of oil and petroleum products are transferred over water (between ship and shore) daily. The Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990, as amended, authorizes the California State Lands Commission (CSLC) to regulate all marine oil terminals (MOTs) in California. CSLC's regulations of MOTs are called the Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) and are part of the California Building Code (Chapter 31F). Most marine oil terminals in California were built in the early 1900s when oil was carried by ships much smaller than the size of today's tankers, and before seismic safety standards and environmental review requirements were established. MOTEMS are rigorous building standards designed to upgrade aging terminals to ensure better resistance to earthquakes, protect public health and the environment, and reduce the potential of an oil spill. They establish minimum engineering, inspection, and maintenance criteria for marine oil terminals to protect public health, safety and the environment.

The existing dock at the Chevron Eureka Terminal is not currently in compliance with MOTEMS as the existing structure is inadequate to support the fuel pipeway during the design seismic event specified by the standards. The proposed seismic retrofit project is required by CSLC to bring the dock into compliance. CSLC staff does not provide a final approval of construction for the proposed retrofit project, but can provide exceptions to the design. CSLC staff has reviewed the 100% construction documents for the proposed retrofit project and will continue to review the retrofit work during and following construction.

E. OIL SPILLS

Section 30232 of the Coastal Act states:

> *Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of*

> *such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

Section 30232 requires an applicant to undertake measures to prevent an oil spill from occurring, and requires effective containment and cleanup measures should a spill occur. The purpose of the proposed seismic retrofit of the Chevron Eureka Terminal Dock is to reduce the potential for an oil spill by ensuring the dock's gasoline and diesel pipelines are adequately supported during an earthquake. While the project will reduce the risk of an oil spill once complete, project construction will temporarily increase the risk of a spill as it (a) requires the use of heavy equipment and vessels that could leak or spill hydrocarbons into Humboldt Bay waters, and (b) involves construction and demolition activities in close proximity to the dock's fuel pipelines which could accidentally damage the pipelines and release fuel into the bay.

The project will involve the use of a barge maneuvered by a skiff and tug boat and the use of heavy equipment including a crane, a welder, a winch, a vibratory-pile-driving hammer, potentially an impact-pile-driving hammer, and miscellaneous smaller equipment. These vessels and heavy equipment have the potential to leak or spill fuels, lubricants, or hydraulic oils into coastal waters.

TABLE 1. CONSTRUCTION EQUIPMENT FUEL CAPACITY

Equipment	Maximum Fuel Capacity
P&H 670 Truck Crane	75 gallons
APE 200 Power Pack (Vibro)	140 gallons
Lincoln 500 Commander	25 gallons
Deck Winch	50 gallons
Tug Boat	140 gallons

The project also involves construction and demolition in close proximity to the dock's four active fuel pipelines, including the removal of 40 piles and pile caps from directly under the pipelines. Three of the fuel lines have a six inch diameter and one has an eight inch diameter, and all four lines are 619 feet long from the dock receipt valves to the first shore-side valves. These 6-inch and 8-inch diameter pipeline segments have the capacity to hold 929 and 1,609 gallons of fuel, respectively. Under the proposed project, when the existing wharf unloading platform and its timber support structure are demolished and the new wharf unloading platform is installed, the pipelines will be cleared of all residual oil, the pipe segments over the wharf will be removed, and the facility will be shut down.[2] However, during the remainder of project construction, including during all trestle retrofit work, the pipelines will remain in place, although construction will be halted during barge fuel deliveries. Although oil will not be actively pumped through the lines at the time of construction, the lines will remain two-thirds to three-quarters full of product. Chevron has determined that a complete facility shut down during the entire project is infeasible because the Chevron Eureka Terminal is the only marine terminal in the region supplying 75% of the region's fuel and there are no realistic options for compensating for the loss of fuel supply that

[2] The process of emptying and isolating the pipelines involves introducing air at the end of the pipeline (west side) to push all remaining product to the shore side. Each pipeline is isolated on the shore side by a ball valve. Once the lines are drained, the end section of each pipe will be removed at the existing flange, which is located over a secondary containment catch basin.

would result from an extended shut down period (an extended discussion of why facility shut down is not feasible for a greater portion of the project is discussed in the "Extended terminal shutdown period" subsection of the alternatives analysis under Section F). If the larger 8-inch pipeline is three-quarters full and ruptures during project construction, 1,206 gallons of gasoline could spill into Humboldt Bay. This is considered a reasonable worst-case scenario spill under the proposed project.

The first test of Coastal Act Section 30232 requires an applicant to "protect against the spillage of crude oil, gas, petroleum products, or hazardous substances..." To prevent spills from heavy equipment and vessels, Chevron proposes to: (a) inspect equipment for leaks prior to commencing work; (b) conduct all equipment maintenance and refueling in a confined area specifically designed to control runoff located more than 100 feet away from the mean high tide line; (c) place containment trays around all heavy equipment on the barge deck; (d) maintain a ten foot setback from the edge of the barge deck when handling fluids and equipment on the barge; and (e) store all hazardous materials in a secured and contained area in a manner that product will not spill due to vessel movement. In addition, Chevron proposes to utilize a vibratory hammer that relies on biodegradable hydraulic fluid. This hydraulic fluid has lower aquatic toxicity than typical hydraulic fluid and breaks down more rapidly in the environment than typical petroleum products, thus reducing the contamination of surface water in the event of fluid spills. To ensure that the applicant complies with the aforementioned oil spill prevention measures, the Commission attaches the measures as part of **Special Condition 7**, "Construction Responsibilities."

To prevent spills from pipeline rupture, as described above, Chevron proposes to (a) remove the pipelines during the majority of the work on the wharf, and (b) shut down construction during barge unloading operations to minimize the amount of product remaining in the lines during the remaining work. In addition, Chevron proposes to drive new trestle piles with at least two feet of clearance from the southernmost pipe on the pipeway (an out-of-service line that is kept empty), and to position a worker at each pile during installation to monitor clearance and ensure piles are installed plumb. Demolition of the existing timber bents along the trestle will not occur until the pipes are fully supported by the new bents. Existing timber piles to be removed from underneath the pipeway that are located in intertidal areas will be cut four-fifths of the way through by a chainsaw during low tides when they are exposed at the mudline. During the following high tide, the cut piles will be rigged to both a crane and a winch on the construction barge to break them off at the cut line. The winch will keep a lateral pull on the piles as they are being pulled laterally and upward with the crane to prevent the piles from falling back towards the pipeway.

Notwithstanding implementation of the above-described prevention measures, accidental spills can and do occur. The second test of Section 30232 requires that effective containment and cleanup facilities and procedures be provided for accidental spills that do occur. Eureka Chevron Terminal operates under a U.S. Coast Guard approved OPA-90 (Oil Pollution Act of 1990) Facility Response Plan and a California Certificate of Financial Responsibility.[3] The Facility

[3] The Facility Response Plan is intended not only to fulfill OPA-90 requirements of the US Coast Guard (USCG), but also requirements of the US Environmental Protection Agency (EPA), the Occupational Safety and Health Organization (OSHA), and the CDFW Office of Oil Spill Prevention and Response. The Chevron Eureka Terminal also maintains a Dock Operational Manual [in fulfillment of USCG requirements (33 CFR 154 and 156)], a Spill Prevention and Control and Countermeasure Plan [in fulfillment of EPA requirements (40 CFR

Response Plan includes, among other information, a list identifying the location of available emergency response equipment, a detailed checklist of spill response actions including mitigation procedures and spill surveillance/tracking guidelines, a list of emergency contacts and agencies to notify in the event of a spill, information on response team members and responsibilities, and tactical plans for protecting the nearby Palco Marsh and Elk River in the event of a spill. In addition, as part of the OPA-90 requirement, the Chevron terminal is in contract with an offsite spill response company, Marine Spill Response Corporation, which maintains a local (Eureka) site with an inventory of vessels and other response equipment including skimmers, booms, pallets of sorbents and other cleanup gear strategically placed in the Humboldt Bay Area. The Chevron Eureka Terminal also stores spill response equipment on site for rapid response to an incident, including a 1,500-foot-long containment boom and a 300-foot-long absorbent boom stored on the dock, 20 bags of absorbent pads stored in the terminal warehouse, and a spill boat and spill response trailer. Training is given to all marine terminal personnel on a bi-annual basis in boom deployment, spill containment, and proper oil spill notification and prevention. Under typical barge transfer operating conditions, the facility can gain access to and deploy the containment boom in the first hour following a spill related to the transfer of product from a barge to the terminal. Most recently, on March 23, 2016, Chevron, U.S. Coast Guard, California Department of Fish and Wildlife, and the Marine Spill Response Team successfully conducted a response test of equipment available on the site including marine deployment of oil booms.

While the Facility Response Plan adequately demonstrates that the Chevron Eureka Terminal is prepared for an accidental oil spill related to the routine transfer of product from a barge to the terminal, the Facility Response Plan does not address oil spill risks and responses related to proposed project-specific dock construction and demolition activities. In addition, a hired contractor will be performing the proposed work on the Chevron dock, and the Facility Response Plan does not address coordination with third party contractors on spill prevention and response measures. Because the proposed construction project presents a unique spill risk scenario and involves a third party, Chevron has submitted a project-specific Spill Response Plan prepared by their contractor, West Coast Contractors, Inc. While Chevron personnel and equipment will be used to respond to a spill from the dock's fuel pipelines as directed by Chevron's Facility Response Plan as described above, the contractor will respond to any leak or spill resulting from construction equipment and vessels under the project-specific Spill Prevention and Response Plan. The project-specific plan identifies spill prevention and response equipment that will be available onsite, including spill kits on the construction barge equipped with enough material, including absorbent booms and pads, to provide preliminary containment for a volume of product that can reasonably be expected to spill from construction equipment and vessels. The plan also establishes an onsite spill response team comprised of members of West Coast Contractors, Inc, and provides a list of notifications that will be made and a list of measures that will be taken by the contractor in the event of a spill. The Commission attaches **Special Condition 8** to ensure the permittee complies with the spill prevention and response measures contained in the Facility Response Plan for the Chevron Eureka Terminal and the project-specific Spill Response Plan.

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112)], an RCRA Contingency Plan (required under 40 CFR 265.54, California Department of Toxic Substances regulations, Title 22, Chapter 15, Article 4) and an Emergency Response Action Plan [required under 29 CFR 1910.38(a)(2) and 1910.120(l)(2) (OSHA Emergency Response Plan and Emergency Action Plan) and 40 CFR Part 112.20 (EPA Emergency Response Action Plan)].

Based on the mitigation measures included in the project, and as conditioned, the Commission finds that Chevron will undertake appropriate measures to protect against spillage of oil and other hazardous substances and effectively contain and respond to accidental spills that do occur consistent with the requirements of Coastal Act Section 30232.

F. FILL IN COASTAL WATERS AND PROTECTION OF MARINE RESOURCES

Section 30230 of the Coastal Act states, in applicable part, as follows:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states as follows:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30233 of the Coastal Act states, in applicable part, as follows:

> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
>
> *(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
>
> *(2) Maintaining existing, or restoring previously dredged depths on existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
>
> *(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*

(4) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(6) Restoration purposes.

(7) Nature study, aquaculture, or similar resource dependent activities.

...

(c) 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…

Coastal Act Section 30108.2 defines "fill" as "*earth or any other substance or material, including pilings placed for the purposes of erecting structures thereon, placed in a submerged area*." The proposed project involves the installation of 20 new 16-inch diameter steel piles and four new 24-inch diameter steel piles within open and intertidal waters of Humboldt Bay, resulting in the placement of 40.5 square feet of fill. The placement of new pile fill will be offset by the removal of 71 14-inch diameter timber piles, resulting in a net reduction of 35.4 square feet of pile fill within the bay (See Table 2). The proposed project also involves temporary fill of bay substrate from the anchoring of a barge used to access the dock during project construction. The barge will be anchored by two 2.3-foot diameter spuds, resulting in approximately 4.3 square feet of temporary fill per spud pole placement. The Commission must consider whether authorizing the aforementioned fill is consistent with Coastal Act policies addressing the protection of the marine environment, including, but not limited to the requirements of Section 30233 regarding the filling of coastal waters.

TABLE 2. FILL OF COASTAL WATERS

Fill Removal & Placement	**No. of piles**	**Diameter (in)**	**Area (sf)**
Piles to be installed at wharf	4	24	12.6
Piles to be installed at trestle	20	16	27.9
Piles to be removed at wharf and trestle	-71	14	-75.9
Net Reduction in Fill			**35.4 square feet**

The Commission may authorize a project that includes wetland fill if the project meets the four tests of Coastal Act Section 30233. The first test requires that the proposed activity fit within one of seven use categories described in Coastal Act Section 30233(a)(1)-(7). The second test requires that no feasible less environmentally damaging alternative exists. The third test mandates that feasible mitigation measures are provided to minimize any of the project's adverse environmental effects. The fourth test requires that the biological productivity and functional capacity of the habitat shall be maintained and enhanced where feasible.

Allowable Use

The first test set forth above is that any proposed filling, diking or dredging must be for an allowable purpose as specified under Section 30233 of the Coastal Act. The proposed project, a seismic retrofit of an existing marine shipping terminal, is an allowable use of fill in coastal

waters pursuant to Coastal Act Section 30233(a)(1), which allows fill for port, energy, and coastal-dependent industrial facilities.

Alternatives Analysis

The second test set forth by Section 30233 is that the proposed project must have no less environmentally damaging feasible alternative. Coastal Act Section 30108 defines "feasible" as "*…capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors*." In this case, alternatives that have been identified include: (1) the "no project" alternative; (2) alternative pile installation methods; (3) alternative dock construction access methods; (4) extended terminal shutdown period; (5) alternative pile materials; and (6) alternative pile sizes.

a. No project alternative

The primary purpose of the proposed project is to retrofit the Chevron dock to prevent oil spills during a seismic event. Under the "no project" alternative, the objective of the project would not be met. Humboldt County is a very active tectonic region subject to frequent, and sometimes large, earthquakes, and the Chevron dock is located on unstable soils within a mile of a fault line, the Little Salmon Fault Line. According to a structural engineering evaluation of the dock, the existing timber structure, while suitable under normal operating conditions, would experience catastrophic failure during the considered seismic events due to strong ground shaking and induced lateral soil movement. The timber piles do not have the strength to withstand this lateral loading. Furthermore, the typical connection between existing piles and pile caps consists of a simple steel pin, which is also likely to fail a significant seismic event, resulting in loss of support for the dock's pipeway. The proposed project would replace the timber pipeway support structure with a steel foundation designed to withstand a significant seismic event. Although the "no project" alternative would avoid the adverse impacts to coastal resources that are posed by the dock retrofit project, this benefit would disappear when the existing dock ultimately fails. If the dock's pipeway support structure collapses, fuel transfer lines could rupture and spill fuel into the bay, severely impacting water quality and marine resources and temporarily shutting down the marine terminal, leaving the greater Eureka area without the terminal it currently relies on for 75% of its fuel. As the project is necessary to maintain safe transport of fuels at the site, the no project alternative is not a less environmentally damaging feasible alternative to the proposed project as conditioned.

b. Alternative pile installation methods

The applicant proposes to install 24 hollow steel piles using a vibratory hammer until target tip depths are reached, which vary from -76 feet to -36.5 feet depending on the depth of the mudline at the pile location. In the event that the vibratory hammer hits refusal before the target tip depth is reached, an impact hammer will be used to drive the piles to final depth. Impact pile drivers are piston-type drivers that use various means (ignition, hydraulics, or steam) to lift a piston to a desired height and drop the piston against the head of the pile in order to drive it into the substrate. In contrast, vibratory pile drivers are oscillatory hammers that vibrate the pile, causing the sediment surrounding the pile to liquefy and allow penetration. Pile driving with an impact hammer generates hydroacoustic pressure impulses and particle velocities that can cause effects on fish

ranging from altered behavior, hearing loss, and tissue injuries to immediate mortality. Vibratory hammers produce sound energy that is spread out over time with peak sound levels that are generally 10 to 20 dB lower than those produced by impact hammers, and thus can be a less environmentally damaging alternative than impact pile driving.[4]

However, while vibratory hammers generally produce much lower sound amplitudes, the total energy imparted can be comparable to impact driving because the vibratory hammer operates continuously and requires more time to install.[5] In addition, the use of a vibratory hammer is not always feasible because the impact forces are not as great as those generated by an impact hammer and therefore are not always adequate to drive piles deep enough to obtain the necessary structural capacity. The feasibility of the vibratory method depends on a number of factors, including pile length, diameter, and composition; the substrate conditions under the piles; and the bearing capacity necessary for the piles.[6] According to a memorandum dated May 9, 2016 and prepared by Earth Mechanics, Inc., a geotechnical engineering firm working on the retrofit project, based on substrate conditions encountered at the subject site, the proposed steel piles will likely be able to be driven with a vibratory hammer to the design tip elevations with minimal chance of early refusal. Peak and cumulative noise levels are not likely to exceed injury threshold levels if a vibratory hammer is used to place the piles.

As described further in the section on mitigation measures below, the Commission attaches **Special Condition 9** which requires the use of a vibratory hammer only, unless refusal is reached with the vibratory hammer prior to the pile reaching its required tip depth as specified in Plan Sheet S-24 attached as **Exhibit 5, page 10**. If early refusal does occur and an impact hammer must be utilized, Special Condition 9 requires (1) the implementation of a number of measures to minimize sound levels including the use of a pile cushion and bubble curtain; (2) the monitoring of sound levels during any impact pile driving; and (3) the cessation of pile-driving activities if sound levels exceed a threshold at which fish over two grams are likely to receive lethal physical injury.

In the event that vibratory pile driving meets early refusal and impact pile driving is necessary, an accumulated sound exposure level (SEL) of 183 dB may be exceeded. An accumulated SEL of 183 dB is considered the sound threshold for injury to fish weighing less than two grams, including juvenile longfin smelt that may be present in the project vicinity during pile installation. The accumulated SEL is an estimate of the total underwater sound energy a fish may be exposed to through one day of pile driving. The applicant can prevent the accumulated SEL from exceeding 183 dB by halting pile driving for 12 hours when accumulated SEL nears the 183 dB threshold. However, based on sounds generated during a previous project at Chevron's dock and during projects elsewhere with similarly sized steel piles, halting pile driving below 183 dB accumulated SEL is likely to severely limit the amount of pile driving (i.e., number of hammer strikes) that can occur each day. Under a worst case scenario situation where all piles meet refusal with the vibratory hammer several feet from design depth, not all work would be able to

[4] California Department of Transportation, 2009, p. 2-26.
[5] Ibid.
[6] Ibid., 4-9.

be completed within the required in-water work window of July 1st through October 15th if impact pile driving was halted upon reaching 183 accumulated SEL. Because the in-water work window is necessary to avoid migratory salmonids, it would be more environmentally damaging to extend the work window. Also, because the wharf retrofit and trestle retrofit must each be completed in their entirety during one respective construction season in order for the fuel terminal to continue to function the rest of the year, it is not feasible to extend construction over a third year in order to reduce the necessary daily pile-driving strike count. As described further in the section on mitigation measures below, Chevron proposes to mitigate for potential exceedance of the 183 dB accumulated SEL threshold through the removal of approximately 105.3 square feet of nearby bay fill (in order to create fish habitat).

Given that the applicant will: (1) perform in-water work during the time of year salmonids are least likely to be present in the project vicinity; (2) attempt to avoid impact pile driving by using a vibratory pile driver until refusal; (3) employ a number of sound minimization measures if impact pile driving is necessary; (4) cease impact pile-driving activities if sound levels exceed a threshold at which fish over two grams are likely to receive lethal physical injury; and (5) mitigate for potential injury to fish weighing less than two grams, the Commission finds that installing the new steel piles as proposed and conditioned is the least environmentally damaging feasible pile installation method.

c. Alternative dock construction access methods

The retrofit work will be performed from the dock or shore where feasible (e.g., work on the dock bents closest to the shore would be performed by positioning the crane on land). Where it is not feasible to perform work from the dock or shore, the applicant proposes to access the dock from a floating construction barge maneuvered by a tugboat. In 2000, the Commission issued a CDP for repairs and improvements to the Chevron dock including the replacement of approximately 50 piles (CDP No.1-00-013). At that time, the Commission allowed for a construction barge to rest on the mudflat during low tides. For the current project, the applicant is instead proposing to avoid grounding of the barge entirely by only allowing work in shallow waters during high tides and using depth-sounding equipment to alert the barge operator as tide levels recede. Moving the barge in on the incoming tide and out on the outgoing tide will cause the construction project to take longer and will result in the barge being repositioned and anchored a greater number of times. However, this method will prevent the barge from grounding in mudflat or eelgrass habitat.

The applicant has also considered using a jack-up barge that would be supported by four piles and therefore would be able to remain in place during low tides without the barge platform grounding. However, jack-up barge spud piles are typically hollow, resulting in a large volume of mud being captured within the piles when the piles are placed, and likely deposition of large volumes of mud when the piles are removed. This generation of suspended sediment could negatively impact marine organisms and their habitat. Therefore, utilizing alternative construction access methods as described above is not a less environmentally damaging feasible alternative to the proposed project as conditioned.

d. Extended terminal shutdown period

As proposed, the Chevron Eureka Terminal will only shut down for a two to three week period during the retrofit of the wharf unloading platform. During the shutdown period, the sections of the fuel pipelines that extend over the existing unloading platform will be cleared and removed to allow for the demolition of the existing unloading platform, removal of 1,300 square feet of the existing wharf and 31 existing timber piles, and the installation of the new unloading platform. The pipelines will remain in place during the rest of the proposed project, including during the removal of timber piles from under the trestle pipeway, and during the installation of new steel piles at the wharf and along the trestle in close vicinity to the pipeway. Construction will temporarily halt whenever an oil product vessel berths at the dock and fuel is being transported through the pipelines (this occurs approximately once every two weeks), but the pipelines will not be cleaned and removed and will have residual oil product that could enter coastal waters if construction work accidently results in the rupture of a pipeline. While there would be less of a risk of water quality impairment from the release of hazardous materials if the terminal shut down for a larger portion of the proposed construction work, this alternative is neither feasible nor less environmentally damaging.

Approximately 75% of the fuel imported into the region is delivered via barge to the Chevron Terminal, with the balance being trucked into the region. The Chevron Eureka Terminal is the fuel source for gas stations as far north as Crescent City in Del Norte County, and within much of Humboldt County ranging from Garberville (southern Humboldt) to Willow Creek (eastern Humboldt), with fuel prices that are generally above the state and national averages. The Chevron Eureka Terminal is the only currently existing certified marine oil terminal in the North Coast District so there are no other options for receiving fuel by barge if the terminal is shut down. During the proposed 2-3 week shutdown of the terminal for replacement of the unloading platform, Chevron will supplement their fuel supply with trucks from the San Francisco Bay Area as soon as the barge offloads the final pre-shutdown shipment. A single barge delivery provides the equivalent of 315 truckloads of fuel or approximately 25 truckloads per day, every day for the two week period. Even with the supplemental fuel being trucked in, it is estimated the terminal could run out of fuel in as little as three weeks. The region therefore cannot afford to rely solely on trucked-in fuel for a longer period of time to allow the terminal to remain shut down for the entire construction window. In addition, the emissions and the potential for accidental spills and accidents on the roadway associated with 315 truck trips roundtrip from the San Francisco Bay Area to Eureka far exceed those of a single barge trip. Therefore, extending the terminal shutdown period during construction is not a less environmentally damaging feasible alternative to the proposed project as conditioned.

e. Alternative pile materials

The applicant proposes to install 24 new steel piles within Humboldt Bay waters. The steel piles will be precoated and cured with DFT Amercoat 240 Epoxy that extends from the top of the pile to 3.0 meters below the mudline. Piles are typically fabricated out of steel, wood, or concrete. Different types of piles produce different levels of underwater noise when they are driven. Based on sound measurements taken during previous pile-driving projects, during individual pile strikes, concrete and timber piles generate lower peak

sound pressure levels than steel piles and are therefore less likely to generate peak sound pressure levels that cause injury to fish and marine mammals. However, timber piles have been found inadequate to support the subject dock's pipeway during the design seismic event. Also, pressure-treated timber piles are more likely than steel piles to result in water quality impairment because they could potentially leach toxic wood preservative chemicals into coastal waters. In contrast, concrete piles could be designed to satisfy the required seismic loads and would not result in any additional water quality impacts. However, in order to develop a new concrete piled structure, a new cast-in-place concrete deck would need to be installed which would greatly extend the length of project construction and facility shutdown. In addition, while hollow steel pipe piles may be able to be installed using only a vibratory hammer, concrete piles would necessarily require impact hammer driving, possibly with jetting, in order to attain the required pile tip elevations within the typical soils at the site. Pile driving with an impact hammer generates hydroacoustic pressure impulses and particle velocities that can cause a range of effects on fish from altered behavior to physical injury or mortality. Therefore, the use of timber or concrete piles is not a less environmentally damaging feasible alternative to the proposed project as conditioned.

f. Alternative pile sizes

The proposed project includes the installation of four 24-inch-diameter piles at the wharf unloading platform and 20 16-inch-diameter piles along the trestle. Driving of smaller piles could reduce peak sound pressure levels. However, use of smaller piles often requires that more piles be installed. More piles installed could result in a larger number of pile strikes, resulting in larger accumulated SEL values. Based on hydroacoustic monitoring data collected during impact pile driving at the Chevron dock in 2015 and estimated noise levels for the current project (calculated using the NOAA Fisheries Pile Driving Calculations spreadsheet), accumulated SEL values are more likely to reach levels that could result in injury to fish than peak sound pressure levels during any impact pile driving that may occur as part of this project. Therefore, in this case, based on the monitoring data collected in 2015, the driving of fewer larger piles will have less of an impact on fish.

Furthermore, installation of smaller piles could actually increase the amount of wetland fill necessary because a greater number of piles would need to be installed. For instance, under the current project, the replacement of smaller diameter timber piles with larger diameter steel piles actually results in a net reduction of wetland fill because the use of larger steel piles results in the need for fewer piles overall. Along the dock's trestle, 20 16-inch-diameter steel piles will replace 40 14-inch diameter timber piles, resulting in a net reduction of 14.8 square feet of fill. At the wharf unloading platform, four 24-inch-diameter steel piles will replace thirty-one 14-inch-diameter timber piles, resulting in a net reduction of 20.5 square feet of fill.

According to the applicant's engineering consultant, the proposed pipeway bents along the trestle are designed as single piles in place of more conventional two pile bents to minimize the amount of fill necessary. The choice of four 24-inch-diameter piles supporting the unloading platform area was also made to minimize fill. Furthermore, pile

diameters of 24 inches at the unloading platform and 16 inches along the trestle are the smallest diameters which satisfy the design seismic loads. Therefore, the use of smaller diameter piles is not less environmentally damaging feasible alternative to the proposed project as conditioned.

Feasible Mitigation Measures

The Commission must ensure that the proposed wetland fill project minimizes adverse environmental effects consistent with Section 30233. Humboldt Bay is the second largest estuary in California and provides a rich diversity of natural habitats, including tidal marshes, sloughs, and man-made channels, as well as intertidal flats, eelgrass beds, and deepwater estuarine habitats. Diverse habitats within the bay support up to 120 species of fish, 251 species of marine birds, 550 species of marine invertebrates, 80 species of algae and numerous resident and visiting marine mammals.[7] (HD, 2016). Chinook salmon, coho salmon, and steelhead trout, all of which are federally listed as threatened, travel through Humboldt Bay as juveniles when out-migrating to the ocean and as adults when migrating back to their natal streams for spawning. Green sturgeon, also federally listed at threatened, are known to forage in Humboldt Bay from the deeper channels up into intertidal areas at high tides. Longfin smelt, which is state listed as threatened, have a sustained population within Humboldt Bay and migrate up tributaries of the bay to spawn.

The proposed project could have a number of potential adverse effects on the environment of Humboldt Bay, including hydroacoustic impacts of pile driving on fish and marine mammals, fill of bay muds, disturbance of eelgrass habitat, and degradation of water quality. The potential impacts and their mitigations are discussed in the following sections:

a. Acoustic impacts of pile driving on fish

Chevron proposes to install four 24-inch-diameter steel piles and two 16-inch diameter steel piles during 2016 and eighteen additional 16-inch diameter steel piles in 2017, for a total of 24 new piles. While it is likely that a vibratory hammer will be able to be used to drive the piles to their target tip depths, an impact hammer may be utilized if the vibratory hammer meets early refusal. Pile driving with an impact hammer generates hydroacoustic pressure impulses and particle velocities that can cause a range of effects on fish from altered behavior to physical injury or mortality. The waters of Humboldt Bay provide habitat for over 100 fish species, including a variety of commercially significant and environmentally sensitive species that could be impacted by the proposed potential use of an impact hammer.

The sound generated by pile driving depends on the pile size and type, pile driver type, the substrate the pile is driven into, any sound attenuation methods used, and the number of hammer strikes per day.[8] The effects of the sound generated in turn depend on numerous factors including the intensity and characteristics of the sound, the shape of the water body, the composition of the water body substrate, the distance and location of the fish in the water column relative to the sound source, the presence of obstructions between the fish and sound source, the size and mass of the fish, and the fish's anatomical

[7] Humboldt bay Harbor, Recreation, & Conservation District, 2015.
[8] California Department of Transportation, 2009, op cit.

characteristics.[9] Because of the many variables involved, it has been difficult for the various regulatory agencies to estimate fisheries impacts and set standards with regards to pile driving. In order to improve and coordinate information, the California Department of Transportation (Caltrans), in coordination with the Federal Highways Administration (FHWA) and the departments of transportation in Oregon and Washington, established a Fisheries Hydroacoustic Working Group (FHWG) including representatives from NOAA Fisheries, U.S. Fish and Wildlife Service, CDFW, and the Army Corps. The working group has established interim standards that indicate the sound exposure levels at which fish are likely to receive lethal physical injury.[10]

Based on these standards, NOAA Fisheries, CDFW, and the Coastal Commission currently use a dual metric criteria of 206 decibel (dB) peak sound pressure level (SPL) at 10 meters for any single strike, and an accumulated sound exposure level (SEL) of 187 dB at 10 meters as thresholds to correlate physical injury to listed fish (except those weighing less than 2 grams) exposed to underwater sound produced during the installation of piles with impact hammers. For fish less than 2 grams in weight, the injury threshold criteria for accumulated SEL is 183 db. The peak SPL is the maximum absolute sound pressure generated during a single pile strike, while the accumulated SEL is an estimate of the total underwater sound energy a fish may be exposed to through a pile-driving event (i.e., one day of pile driving). Both peak SPL and accumulated SEL criteria are considered because both exposure to high levels of sound for a short period of time and lower levels of sound for a relatively long period of time can impact fish.

To predict the sound levels of a particular project, the standard is to use empirical data from projects with conditions similar to the project being evaluated. In this case, 24 and 16-inch diameter steel pipe piles will be utilized. Based on information compiled by the California Department of Transportation,[11] an impact pile-driving project in Rodeo, California involving installation of 24-inch-diameter steel pipe piles generated a 203 dB peak SPL at a distance of 10 meters. This predicted peak SPL is below the peak SPL threshold of 206 dB set by the working group as potentially resulting in injury to fish.

The SEL of one pile strike (an estimate of the total energy of the strike), identified by the same project in Rodeo was 178 dB at 10 meters. Under a worst-case scenario, under the proposed project, piles would meet refusal with the vibratory hammer several feet from design depth, requiring around 100 strikes with the impact hammer to set the piles. Based on an estimate of 100 strikes per day and the SEL estimate of 178 dB, the resulting accumulated SEL would be 198 dB at 10 meters.[12] This accumulated SEL exceeds the threshold accumulated SEL of 187 dB set by the working group and therefore could potentially result in injury to fish in close proximity to pile driving. It is important to note that site conditions at the project site may result in noise levels that are different than those reported by Caltrans. In 2015, hydroacoustic monitoring was conducted during the impact pile driving of fifteen 16-inch-diameter timber piles at the Chevron dock. The number of

[9] Ibid.
[10] Fisheries Hydroacoustic Working Group, 2008.
[11] California Department of Transportation, 2007.
[12] Cumulative SEL = single-strike SEL + 10*log(# of strikes)

strikes it took to impact drive each pile ranged from 111 to 776 (the piles were not first driven with a vibratory hammer as currently proposed). The peak SPLs generated were below 200 dB, while the accumulated SEL reached and exceeded the 187 dB threshold often after driving just one pile, at as few as 75 strikes.

Chevron has proposed a number of measures to avoid or minimize the potential exposure of Humboldt Bay fish to sound generated by pile driving. First, Chevron plans to limit in-water project work to the period of July 1st to October 15th of each year, when anadromous fish are least likely to be present in the area (i.e. before the majority of the upstream adult spawning migrations and after the downstream migration of smolts has occurred). The Commission attaches **Special Condition 5** which requires implementation of the proposed limitation on the timing of in-water construction activities.

Furthermore, in the event that vibratory pile driving meets early refusal and impact pile driving is necessary, Chevron proposes to minimize the impacts of impact pile driving on marine life by utilizing a "soft start" approach where hammer strikes will begin at low pressure and slowly increase to full hammer strength in order to frighten fish away from the piles before the acoustics generated by pile driving approach levels that could cause injury. Because fish are highly mobile and there is abundant suitable habitat nearby, it is possible that a soft start will cause fish to flee before they are negatively impacted. However, little is known about fish's behavioral responses to pile driving and whether they will flee from habitats impacted by sound.[13] In addition, Chevron proposes to use a combination of nylon and aluminum cushion blocks between the hammer and piles to dampen the noise generated while driving the piles. Studies conducted by the Washington State Department of Transportation indicate that nylon cushion blocks can reduce sound pressure levels 4 to 5 dB.[14]

Finally, Chevron proposes to use an air bubble curtain around piles being impact driven to attenuate underwater noise generated by pile driving. The curtain generates underwater air bubbles that rise up around the pile and act as a screen, inhibiting the propagation of sound from the pile. Empirical data from past pile-driving events compiled by Caltrans generally indicates that an air bubble curtain used on a steel or concrete pile with a maximum cross-section dimension of 24 inches or less will provide about 5 dB of noise reduction.[15] A rapidly incoming or outgoing tide can carry bubbles away from the pile being driven, reducing the bubble curtain's effectiveness. Therefore the applicant proposes to limit pile driving to periods around slack tides when current speeds do not prevent the bubble curtains use as an effective attenuation measure. According to the applicant, a hydroacoustic monitor will visually confirm that the bubble curtain is operating effectively during impact pile driving. Also, the applicant proposes to use a stacked series of bubble-producing extruder rings which tends to be more effective at surrounding a pile with bubbles than a single ring. The Commission attaches **Special Condition 9(B)** requiring implementation of these minimization measures proposed by the applicant.

[13] Hastings, M. C. and A. N. Popper, 2005.
[14] California Department of Transportation, 2009, op cit., 4-11.
[15] Ibid., 4-10.

To ensure that the aforementioned avoidance and minimization measures are adequate to reduce sounds below the duel criteria thresholds for injury to fish, the applicant has submitted an Underwater Noise and Marine Mammal Monitoring Plan, dated April 29, 2016 and prepared by H.T. Harvey & Associates (**Exhibit 6**). As described in the plan, Chevron proposes to conduct hydroacoustic monitoring during all pile driving with an impact hammer. Two hydrophones will be used to monitor sound; one will be placed at 10 meters from the pile that is undergoing sound testing and the second will be placed at varying distances to determine the relationship between sound levels and distance from impact. A qualified hydroacoustic technician will monitor peak SPL and accumulated SEL in real time to ensure the sound levels at 10 meters remain below the 206 dB and 187 dB respective thresholds. The contractor will coordinate with the acoustic technician to ensure that the monitoring equipment is in place and operational before pile driving begins. Underwater sound levels will be monitored continuously for the duration of each pile-driving event. If accumulated SEL reaches 186.5 dB at 10 meters, the monitor will signal the equipment operator to stop pile driving and pile driving will cease for at least 12 hours. Chevron proposes to submit a report describing hydroacoustic monitoring results within 90 days of Phase 1 of the project (if any impact pile driving occurs during Phase 1), and a second report within 90 days of project completion including data collected and summarized from all Phase 1 and Phase 2 monitoring locations and times. The Commission attaches **Special Condition 9(C)** to ensure implementation of the plan.

If either of the dual criteria thresholds are exceeded (206 dB peak SPL or 187 accumulated SEL), Chevron proposes to cease pile driving and implement sound attenuation methods and/or further limit the number of pile strikes per day to ensure that pile-driving does not reach or exceed sound thresholds. The Commission attaches **Special Condition 9(C)(iv)** which requires that, in the event that either criterion of the dual metric exposure criteria is met or exceeded, all pile-driving operations shall immediately stop and no further pile driving shall occur until the Executive Director, in consultation with the fisheries biologists of CDFW and NOAA Fisheries, authorizes recommencement of pile driving based on the resumption of hydroacoustic monitoring and the deployment of additional sound attenuation measures or other measures deemed likely by qualified technical experts to return the pile driving to conformance with the dual metric exposure criteria. In addition, **Special Condition 9(C)(v)** specifies that if after additional sound attention measures are deployed, either sound exposure level is again exceeded, pile driving will be stopped immediately and will not re-commence until or unless the Commission approves an amendment to CDP 1-16-0049 that proposes changes to the project that prevent further exceedance of the dual metric exposure criteria.

Longfin smelt, a state-listed threatened species, have a sustained population within Humboldt Bay, and juvenile longfin smelt weighing less than two grams may be present in the project vicinity during the in-water construction window. As discussed in the subsection on alternative pile installation methods above, the FHWG has identified a threshold accumulated SEL of 183 dB at ten meters for injury to listed fish weighing less than two grams. As described in the alternatives analysis subsection above, if impact pile driving is necessary, it may not be feasible to prevent the accumulated SEL of exceeding 183 dB and thus there may be injury to juvenile longfin smelt and other small fish

weighing less than two grams located in the project vicinity. Based on reports of the limited presence of longfin smelt in the bay, with the incorporation of the above described acoustic minimization and mitigation measures, the incidental take permit application prepared for the project determined that the project is expected to result in the take of one longfin smelt. CDFW staff has reviewed the incidental take permit application and confirmed that the take of one longfin smelt is unlikely but may occur. As mitigation, Chevron proposes to remove a derelict structure north of the Chevron Terminal dock's trestle (**Exhibit 8**), which includes five 14-inch-diameter piles and a portion of a dolphin, covering approximately 105.3 square feet of mudflat area. The removal of this derelict structure composed of creosote-treated wood will improve water quality and create additional habitat for longfin smelt and other small fish species in the bay waters previously displaced by structural fill. Chevron proposes to remove the structure during the second year of project construction using the same methods proposed for the proposed removal of the dock's timber piles. The Commission attaches **Special Condition 9(D)** to assure the mitigation will occur in conjunction with the terminal retrofit project during the August 1st – October 15th work window, consistent with the limitations and responsibilities outlined in the special conditions of this permit.

The Commission finds that based on: (1) the proposed avoidance, minimization, and monitoring measures; (2) the proposed mitigation for the potential direct impacts to longfin smelt; and (3) the attachment of Special Conditions 4 and 8, the proposed development will minimize adverse acoustic impacts on fish species.

b. Acoustic impacts from pile driving on marine mammals

Humboldt Bay supports a number of marine mammals including harbor seals (*Phoca vitulina*), harbor porpoises (*Phocoena phocoena*) and California sea lions (*Zalophus californianus*) that can also be impacted by the sounds generated by impact pile driving. Based on information from the FHWG, 180 dB is the underwater injury threshold for marine mammals. As described above in the previous subsection on fish impacts, pile-driving activities in Rodeo similar to those that are proposed for the subject project produced peak sound levels of 203 dB at a distance of 10 meters and thus could injure marine mammals. To avoid injury to marine mammals, the Underwater Noise and Marine Mammal Monitoring Plan prepared for Chevron by H.T. Harvey & Associates (**Exhibit 6**) proposes hydroacoustic monitoring of the first impact driven pile installed to determine the actual distance from pile driving at which underwater sound levels caused by pile driving reach 180 dB. If the sound threshold for injury to marine mammals is reached, the distance from the pile will be measured and a shutdown zone equal to that distance will be established around all subsequent piles being impact driven. According to the plan, if a shutdown zone needs to be established because sound levels caused by pile driving reach 180 dB, then the biological monitor present throughout all pile replacement activities will visually search for marine mammals in the project area and alert equipment operators as needed. The observer will visually scan the action area for the presence of marine mammals at least 30 minutes prior to and continuously throughout periods of impact pile-driving activities. If any marine mammal is about to enter or is observed within the shutdown zone during pile driving, the pile-driving activities will be shut down until the animal has moved outside the shutdown zone. The Commission attaches **Special**

Condition 9(E), which requires implementation of the proposed monitoring and mitigation measures for acoustic impacts to marine mammals. The Commission finds that the proposed development, as conditioned, will minimize adverse acoustic impacts on marine mammals.

c. Fill of bay mud

As discussed above, the proposed dock work involves the installation of 20 new 16-inch diameter steel piles and four new 24-inch diameter steel piles within open and intertidal waters of Humboldt Bay, resulting in the placement of a total of 40.5 square feet of fill. The placement of new pile fill will be offset by the removal of 71 14-inch diameter timber piles (for a net reduction of 34.5 square feet of fill). Nine of the piles to be installed and 46 of the piles to be removed occur in mudflat and deep water habitat devoid of eelgrass, resulting in a net reduction of 29.5 square feet of pile fill in bay muds.

TABLE 3. FILL IN BAY MUD

Piles in bay mud devoid of eelgrass	**No. of piles**	**Diameter (inches)**	**Area (square feet)**
Piles to be installed at wharf	4	24	12.6
Piles to be installed at trestle	5	16	7.0
Piles to be removed at wharf	31	14	-33.1
Piles to be removed at trestle	15	14	-16.0
Reduction in Fill (outside of Eelgrass Habitat)			**29.5 square feet**

Chevron proposes to remove all old piles in their entirety to ensure this net reduction in fill is achieved. If piles break during removal, Chevron proposes and the Commission requires as **Special Condition 6** that all existing piles that cannot be removed in their entirety are cut off one-foot below the mudline to ensure that the total area of displacement of bay muds is minimized. Removal of the piles in this manner will enable sediment to eventually settle in the holes from which the piles will be removed and reestablish mudflat within the areas previously displaced by the piles. Thus, the proposed project, as conditioned, will minimize adverse environmental effects from the fill of mudflat and deep water habitats.

d. Disturbance of eelgrass habitat

Native eelgrass (*Zostera marina*) grows in the project area north and south of the trestle from within 33 feet of the shoreline to the margin of the dredged channel, approximately 400 feet from the shoreline. Eelgrass is essential to the health and productivity of the Humboldt Bay ecosystem as it provides many ecological benefits, including stabilization of bottom sediments; a substrate for epiphytic algae and invertebrates; shelter, foraging, and rearing habitat for fish and invertebrates; and food for migratory waterfowl.

The proposed retrofit of the wharf unloading platform scheduled to occur during the first year of construction will be conducted in subtidal regions too deep to support eelgrass, while the retrofit of the trestle and attached pipeway scheduled to occur during the second year of construction will require work in shallower regions that support eelgrass. Twenty-five existing 14-inch-diameter timber trestle piles will be removed from eelgrass habitat,

and fifteen new 16-inch-diameter steel piles will be installed in eelgrass habitat, resulting in a net reduction of 5.8 square feet of fill in eelgrass habitat.

TABLE 4. FILL IN EELGRASS HABITAT

Piles in Eelgrass Habitat	No. of piles	Diameter (inches)	Area (square feet)
Piles to be installed	15	16	20.9
Piles to be removed	25	14	-26.7
Reduction in Fill in Eelgrass Habitat			**5.8 square feet**

In addition to permanent impacts to eelgrass from the installation of new steel piles, project construction could potentially result in inadvertent impacts to eelgrass from substrate disturbance associated with pile installation and removal or barge maneuvering and anchoring activities. Piles and other elements of the dock will be removed and installed by a crane mounted on a barge that will access the trestle from its south side and will be anchored by two 28-inch-diameter spud poles that penetrate the bay mud up to 10 feet. Because work on the easternmost trestle bents can be performed from the shore, it is estimated that one new pile will be installed and two bents will be demolished in eelgrass habitat without any barge anchoring. In addition, on the western end of the trestle, it is estimated that four new piles will be installed and seven bents will be demolished in eelgrass habitat with the barge anchored in deep water outside of the eelgrass bed. The remaining ten trestle piles to be installed in eelgrass habitat will be installed with the barge anchored in the eelgrass. It is estimated that one barge placement will be required for each pile to be installed in eelgrass habitat, and later a second barge placement will be required at each new pile to install the pipeway support beam and its brace. In addition, approximately fourteen bents will be demolished with the barge anchored in eelgrass habitat. It is estimated two bents will be demolished per barge placement, so a total of seven barge placements will be necessary to complete demolition. Based on the above estimates, the barge will need to be anchored in eelgrass habitat 27 separate times, resulting in 232 square-feet of temporary fill impacts (27 barge positions X 2 spud pole anchors per barge position X 4.3 square feet of fill per anchor).

A tugboat and skiff will be used to position the barge over the eelgrass bed. In shallow depths, the propellers of both the tugboat and the skiff have the potential to create turbulent conditions (propeller wash) that can disturb or damage eelgrass beds. The increased turbulence of the propeller wash could cause minor disturbance such as turbidity and dislodging of weak eelgrass blades or more severe damage such as uprooting of eelgrass turions. According to the applicant, the assist vessels will avoid areas of eelgrass when possible and stay in deeper water to minimize propeller scarring of eelgrass beds.

Temporary substrate disturbance from pile installation and removal and barge maneuvering and anchoring activities is not expected to permanently render the substrate unsuitable for eelgrass growth.[16] If small areas of eelgrass turions are inadvertently

[16] During a post-construction inspection in 2015 following a repair project at the Chevron Eureka Terminal Dock that involved the same barge anchoring methods, surveyors were unable to identify the locations of spud pole sets, suggesting that their impact on eelgrass may be minimal or non-existent.

uprooted or crushed, it is expected that eelgrass would recover sufficiently through natural vegetative expansion and seedling recruitment; however, it is unknown how much time would be needed to achieve full recovery. Delays in recovery greater than one year would constitute a temporal loss of eelgrass habitat requiring compensatory mitigation.

To address any unexpected or inadvertent permanent impacts to eelgrass from the project, Chevron has submitted an Eelgrass Mitigation and Monitoring Plan, dated April 28, 2016 and prepared by H.T. Harvey & Associates (**Exhibit 7**). The plan incorporates a number of measures to minimize impacts to eelgrass. The impacts of barge anchoring will be minimized by limiting the area of substrate disturbance to the placement of two 28-inch-diameter spud poles at each barge work location (4.3 square feet of temporary fill per barge spud pole placement). In areas with a patchy eelgrass distribution, attempts will be made to place the barge spud poles in between eelgrass patches on mudflat devoid of eelgrass. In addition, to avoid grounding of the barge or propeller scarring, work in eelgrass habitat will be scheduled to occur at tides high enough to allow the barge to remain afloat. Depth-sounding equipment will be used to help alert the barge operator as tide levels recede and the barge will be moved into deeper water before becoming grounded on the mudflat. Finally, a biological monitor will be present on site while work is being performed in eelgrass habitat to ensure that these avoidance and minimization measures are implemented. The Commission incorporates these measures related to barge maneuvering and anchoring into **Special Condition 10.**

According to the Eelgrass Mitigation and Monitoring Plan, if the barge is inadvertently grounded during work in eelgrass habitat, permitting agencies will be notified immediately. Areas affected will be documented by photograph, and the most direct method possible will be used to calculate the area damaged (i.e., the area of substrate disturbed will be measured as soon as possible following the incident). This area will be inspected again during the one-year post-construction monitoring survey (described below) to determine if permanent impacts occurred and the amount of compensatory mitigation required. The Commission includes these provisions in **Special Condition 10**.

To determine whether project actions result in permanent impacts to eelgrass, Chevron proposes to conduct a pre-construction eelgrass survey at the project site and a reference site within 60 days prior to construction in eelgrass habitat, and a post-construction eelgrass survey the following year during the same month. Pre and post-construction surveys will be conducted during the active growth period for eelgrass (May through September). No eelgrass monitoring is scheduled for the first year of construction because all work will occur in subtidal regions too deep to support eelgrass.

Surveys will be conducted at the project site in areas where proposed project actions may reasonably be expected to impact eelgrass; specifically, monitoring will be conducted within one 33-foot-wide strip on the south side of the trestle where piles will be removed and installed, and an adjacent 115-foot-wide strip further south of the trestle where the barge will maneuver and spud poles will be anchored. Eelgrass beds in Humboldt Bay are persistent all year, but they exhibit high variability in distribution and density, both seasonally and from year to year. To account for natural variability, surveys will also be

conducted at a 33-foot-wide reference site located 246-279 feet south of the trestle. This reference site is part of the same eelgrass bed, but is far enough away to be unaffected by the project. These three survey areas will extend from the shallowest to the deepest extent of eelgrass occurrence (See **Exhibit 7, pg. 9** for a map of the survey areas). During pre and post-construction eelgrass surveys, eelgrass beds in these survey areas will be mapped and eelgrass spatial distribution, areal extent, percent vegetated cover, and turion density will be sampled as outlined in Chevron's April 2016 Eelgrass Mitigation and Monitoring Plan. Photographs will be taken to represent different survey areas and eelgrass density classes. Survey results will be compared between project and reference sites to help determine whether changes in eelgrass characteristics are attributable to natural variability or project actions.

In addition to the post-construction survey conducted during the following year's eelgrass growing season, Chevron proposes to inspect the project site as soon as feasible following construction to help document the extent of substrate disturbance caused by barge maneuvering and spud pole placement, as this may be difficult to see by the following growing season. As previously mentioned, a biological monitor will be present on-site while work is being performed in areas that may impact eelgrass habitat. The biological monitor will take georeferenced, time-stamped photographs showing all locations where piles are installed or removed, where spud poles are anchored and where any unexpected actions, such as propeller scarring, negatively affect eelgrass. These areas will be photographed again immediately following construction and during the post-construction survey the following year. This georeferenced photo-documentation will be used to compare pre- and post- construction conditions in order to detect any visible scarring. If visible scarring is evident as a result of project actions, then the extent of this area will be measured directly in the field. A visible scar is defined as an area that is devoid of eelgrass cover where a project action is known to have occurred during the previous construction year and where eelgrass occurred during the previous growing season. The Commission attaches **Special Conditions 11(A)** to ensure the aforementioned monitoring measures are implemented.

In cases where the temporary substrate disturbance associated with barge maneuvering or spud pole placement results in unavoidable uprooting or crushing of eelgrass turions, it is expected that eelgrass will be able to revegetate by natural means. The localized areas of disturbance associated with project actions are relatively small, and there are abundant eelgrass propagules available at the site. However, while it is expected that eelgrass will reestablish, it is unknown if or how quickly this will occur. Delays in recovery constitute a temporal loss of eelgrass habitat. Therefore, if there is any visible scarring or detectable decline in eelgrass areal extent, cover, or turion density during the first growing season following construction and the decline or scarring can be attributed to project actions, compensatory mitigation will be implemented.

Special Condition 11(B)(i) includes a requirement that impacts shall be assessed and quantified consistent with the methods detailed in the aforementioned 2016 Eelgrass Mitigation and Monitoring Plan. According to the mitigation plan, the amount of mitigation required will be determined based on evidence of visible scarring and/or

detectable losses in eelgrass areal extent, percent cover, or turion density that are determined to be attributable to project actions based on comparison to the reference survey site. If a decrease in aerial extent is detected through calculations based on mapping, the amount of this area will require compensatory mitigation. If the direct measurement of visible scarring is higher than the area detected by mapping, then the higher value will be used as a basis for mitigation. In addition, within vegetated areas, if a decrease (defined as a greater than 25% reduction) in either mean percent cover or mean turion density is detected relative to the reference site, the decline will require compensatory mitigation. If a decline in both percent cover and turion density can be detected, then the higher value will be used as a basis for mitigation. The magnitude of the impact will be equivalent to the proportion of the decrease. For example, a 25% reduction in eelgrass cover within a 10-square-foot area would constitute a 2.5 square-foot loss of eelgrass habitat.

As noted previously, it is unknown whether any permanent impacts requiring compensatory mitigation will occur. A similar operation in 2015 at the same site (under CDP 1-14-0773), preliminarily reported that the effects of pile driving and barge spud placement were temporary and the eelgrass recovered relatively quickly. It is expected that similar recovery will occur with this operation. Similarly, it was reported by the applicant that propeller wash from the boat used to position the barge in 2015 did not result in any apparent loss of eelgrass turions.

In most cases, in-kind mitigation is the preferred option to compensate for impacts to eelgrass. According to NOAA Fisheries' October 2014 California Eelgrass Mitigation Policy and Implementing Guidelines, in-kind compensatory mitigation is the creation, restoration, or enhancement of habitat to mitigate for adverse impacts to the same type of habitat. Typically, in-kind eelgrass mitigation involves transplanting or seeding of eelgrass into unvegetated habitat. Eelgrass mitigation by transplanting has been attempted four times in Northern California (from the mouth of the San Francisco Bay to the Oregon border) over the past 25 years with a 75 percent failure rate.[17] Because of the lack of success of past eelgrass transplanting projects in Northern California, CDFW and Commission staff have been encouraging eelgrass mitigation in Humboldt Bay through debris removal. Removing debris is generally considered in-kind mitigation when 1) the debris is in an area suitable for eelgrass; 2) the debris is precluding eelgrass growth; and 3) when the debris is removed, eelgrass becomes established in its place.

The proposed removal of 25 timber piles from eelgrass habitat will open up 26.7 square feet of mudflat suitable for eelgrass colonization. In the Eelgrass Mitigation and Monitoring Plan, the applicant proposes a mitigation ratio of 1:1 mitigation area to impact area. In their 2014 California Eelgrass Policy and Implementing Guidelines, NOAA Fisheries recommends a final in-kind mitigation ratio of 1.2:1 mitigation area to impact area. This ratio is based on present value calculation using a discount rate of 0.03, assuming that restored eelgrass habitat achieves habitat function comparable to existing eelgrass habitat within a period of three years or less. In compliance with NOAA Fisheries guidelines, the Commission requires a 1.2:1 in-kind mitigation ratio as part of **Special**

[17] National Marine Fisheries Service, 2014.

Condition 11(B)(ii). At a 1.2:1 eelgrass creation to eelgrass impact ratio, the removal of the 25 piles from eelgrass habitat will result in 1.62 square feet more mitigation than needed to compensate for the 20.9 square feet of permanent impacts on eelgrass habitat resulting from the installation of 15 new steel piles in eelgrass beds. In addition, the piles to be removed and installed in bay muds outside of suitable eelgrass habitat will result in a net reduction of 29.5 square feet of fill in bay mud, which Chevron proposes to use as out-of-kind eelgrass mitigation at a 2:1 ratio (resulting in 14.75 square feet of mitigation credit). NOAA Fisheries' 2014 California Eelgrass Policy and Implementing Guidelines recommends that out-of-kind mitigation proposals are reviewed by relevant regulatory agency staff on a case by case basis. The 2:1 out-of-kind mitigation ratio proposed by Chevron for the removal of piles outside of eelgrass habitat has been reviewed and found appropriate by the Commission's Staff Ecologist. In sum, a total of 16.37 square feet of mitigation will be available to compensate for any losses associated with project activities in addition to the known permanent impacts.

Should temporary impacts to eelgrass be determined to be permanent after the one year post-construction eelgrass survey, the available mitigation resulting from pile removal shall be used for compensation. If the impacted area is determined to be greater than the credited area (16.37 square feet), additional compensatory mitigation shall be performed. If there is a need for additional compensatory mitigation, Chevron proposes to remove marine debris in eelgrass habitat within one year of determination of impacts at a 1.2:1 ratio. Chevron has identified nearby marine debris that could potentially be removed, including over 100 piles on the adjoining City of Eureka parcel and various debris along the Chevron parcel's coastline. Any such removal of additional structural debris would require additional CDP authorization. To ensure mitigation is implemented as described above, the Commission includes these mitigation requirements as **Special Condition 11(B)(ii)**.

Finally, to ensure monitoring and mitigation oversite by the Commission, **Special Condition 11(C)** requires Chevron to submit a monitoring report to the Executive Director for review and approval within 90 days of completion of the post-construction growing season survey. This survey report is required to include eelgrass maps and information on the spatial distribution, areal extent, percent cover, and turion density of eelgrass at the project and reference sites within defined survey areas and within mitigation areas. The report shall also include: (1) a summary of work operations relevant to post-construction assessment of work performed the previous year, including the dates work was performed in eelgrass habitat, the number of times the barge was moved, and the location of spud pole placements; (2) photo-documentation of pre- and post-construction site conditions and areas of substrate disturbance; (3) an impact analysis, including a quantitative assessment of any impacts on eelgrass that may have occurred as a result of project actions; and (4) a calculation of the area required for compensatory mitigation if needed and a description of how mitigation requirements have or will be met.

The Commission finds that the proposed project, as conditioned, will minimize its adverse environmental effects on eelgrass.

e. Impairment of Water Quality

The proposed project involves a number of construction activities that could potentially have an adverse impact on water quality including but not limited to removing (i.e., cutting and/or pulling) various pressure-treated timber elements of the existing dock, sealing cut edges of the existing timber dock with wood preservatives, fabricating and installing steel and concrete elements of the new dock, and coating exposed steel surfaces with a spray-applied epoxy.

To minimize adverse water quality impacts associated with project construction, the applicant proposes to fabricate dock elements offsite to the greatest extent possible, including prefabrication of the new wharf unloading platform. When work must be performed over water (i.e., on the dock or barge), the applicant proposes to use tarps, drip trays and other containment devices to catch debris and hazardous materials before they enter bay waters when feasible, and to use floating containment booms to contain any debris that does enter the bay. In addition, the applicant proposes to hold all debris generated during the project in a containment area on the barge until transferred to the staging area at Humboldt Bay Forest Product dock, where the debris will be placed on a liner, cut to size, loaded in water-tight containers, and hauled offsite to an authorized disposal facility. According to the applicant, debris held on the barge or dock will be contained at all times, and covered with plastic sheeting during high winds and/or precipitation.

To ensure that the applicant complies with the aforementioned BMPs, the Commission attaches the BMPs as part of **Special Condition 7**. Special Condition 7 also specifically requires that (a) cement is prepared and poured in a manner that will prevent discharges of wet cement into coastal waters; (b) rinsate from the cleaning of cement mixing equipment is contained and handled only in upland areas located a minimum of 100 feet from the high tide line; (c) welding occurs only when winds are 5 mph or less; (d) a modified catch basin is used during welding to capture slag and welding rod butts; (e) the procedures outlined in AWPA Standard M4, Standard for the Care of Preservative-Treated Wood Products, are followed when applying preservative to the cut ends of treated wood; and (g) topical preservative is not applied during rain events and a drip tray is used to capture any potential spills or drips.

Therefore, the Commission finds that the project as conditioned provides feasible mitigation measures to minimize the project's potential adverse environmental impacts consistent with Section 30233 of the Coastal Act.

Maintenance and Enhancement of Habitat Values

The fourth test set forth by Section 30233 of the Coastal Act is that any approved dredging or filling of coastal waters must maintain or enhance the biological productivity and functional capacity of the habitat. Sections 30230 and 30231 also require that the biological productivity and the quality of coastal waters be maintained. As discussed in the above Findings, the conditions of the permit will ensure that the development will not have significant adverse impacts on Humboldt Bay species or their habitat. These include Special Conditions 5-11 ensuring that the proposed development will avoid, minimize, and mitigate impacts to eelgrass, fish, marine

mammals, and water quality. Therefore, the Commission finds that the development, as conditioned, will maintain the biological productivity and functional capacity of the habitat consistent with Sections 30230, 30231, and 30233.

Conclusion

In conclusion, the fill in coastal waters associated with the project is allowable as it is required for a coastal-dependent port facility, is the least environmentally damaging feasible alternative, includes feasible mitigation measures to minimize adverse environmental effects, and will maintain the functional capacity, biological productivity, and quality of Humboldt Bay waters. Therefore, the Executive Director finds the proposed project consistent with Sections 30230, 30231, and 30233 of the Coastal Act.

G. HAZARDS

Section 30253 of the Coastal Act states, in applicable part:

> *New development shall do all of the following:*
>
> *(a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*
>
> *(b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area…*

The Chevron Eureka Terminal Dock is located in an active tectonic region in an area at risk of various coastal hazards including tsunami inundation, severe ground shaking, and potential ground failure due to earthquakes. The purpose of the proposed project is to retrofit the dock to be able to withstand a significant seismic event without a pipeline rupture and resulting oil spill. A loose to very loose liquefiable soil layer exists below the mudline at the project site ranging in depth from 7 to 22 feet.[18] This upper soil layer is susceptible to lateral movement during seismic shaking. The proposed new steel pile foundation for the dock's oil transport system has been designed to extend beyond these unstable soils into competent material to provide fixity. The proposed new steel support structure for the dock's oil transport system will also isolate the dock's oil transport system from the existing timber wharf and trestle which have the potential to collapse during a significant seismic event. Under the proposed retrofit, the remaining wharf structure and trestle roadway can collapse without compromising the stability of the new oil transfer supporting structure.

Moffatt & Nichol prepared a Refined Seismic Evaluation Report in October 2014 for the Chevron Eureka Terminal Dock that evaluates the response of the existing dock's oil transport supporting structures to seismic inertial and kinematic loading and provides recommendations for retrofitting the facility. The report was prepared in accordance with California State Lands Commission's

[18] Information on site soils is based on a geotechnical field investigation performed by Blackburn Consulting and submitted as part of the 2010 MOTEMS Audit as described in a memo prepared by Earth Mechanics, Inc. (EMI) and dated September 30, 2014.

(CSLC) 2013 Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) which sets performance standards for the dock structure's response to design seismic events. Under MOTEMS, two different levels of design earthquake motion are defined – a Level 1 Earthquake and a Level 2 Earthquake.[19] With the retrofit, the majority of the structure is likely to sustain minor repairable damage as the result of the Level 1 Earthquake event. During the Level 2 Earthquake event, the structure is likely to be heavily damaged, but will not result in oil spill. The retrofit recommendations generated in the geotechnical report were used by Moffatt & Nichol to develop the project plans (engineer-certified plans attached as **Exhibit 5**). The plans are also reviewed by the State Lands Commission for compliance with MOTEMS and by the City of Eureka's building department (contracted out to the consulting firm Bureau Veritas).

While the seismic retrofit will reduce the risk of an oil spill during a significant seismic event, it does not protect the dock from heavy and possible irreparable damage from large earthquakes and other coastal hazards. Due to the uncertain nature and inherent risk associated with the construction of improvements in high energy coastal environments, the Commission attaches **Special Condition 12**. Special Condition 12 requires the applicant to assume the risks of extraordinary wave, ground shaking, liquefaction, and other hazards and waive any claim of liability on the part of the Commission. Given that the applicant has chosen to implement the project despite these risks, the applicant must assume the risks. In this way, the applicant is notified that the Commission is not liable for damage as a result of approving the permit for the development. The condition also requires the applicant to indemnify the Commission in the event that third parties bring an action against the Commission as a result of the failure of the development to withstand hazards.

As discussed above, the project has been designed specifically to retrofit the Chevron Eureka Terminal Dock's oil transport supporting structures to withstand a significant seismic event without a pipeline rupture and resulting oil spill. Therefore, the Commission finds that the proposed project as conditioned will assure stability and structural integrity, consistent with Section 30253(b) of the Coastal Act. As also discussed above, the project as conditioned will not eliminate all risk to life and property from coastal hazards. However, all feasible mitigation measures necessary to minimize the geologic risks have been incorporated into the project as

[19] Level 1 and Level 2 Earthquakes are defined differently depending on an oil terminal's risk classification level. Chevron's Eureka facility is classified as "low risk" under MOTEMS' existing facility classification system [California Building Code (CBC), Chapter 31F, Division 4, Section 3104F, Table 31F-4-1] based on the amount of exposed oil (< 1200 barrels), number of oil transfers per year (<90), and barge vessel size (< 30,000 tons deadweight). For low risk existing facilities such as the Chevron Eureka Terminal, the Level 1 Earthquake is defined as having a probability of exceedance of 75% in 50 years, corresponding to a 36 year event; and the Level 2 Earthquake is defined as having a probability of exceedance of 20% in 50 years, corresponding to a 224 year event (CBC, Chapt. 31F, Div. 4, § 3104F, Table 31F-4-2). These earthquake recurrence intervals are translated into peak ground acceleration and spectral acceleration values using USGS data. The response of the structure to these acceleration values are then assessed against performance criteria for Level 1 and Level 2 Earthquakes. For a structure to be in compliance with MOTEMS, it must be shown that under a Level 1 Earthquake, the facility will receive no or minor structural damage without interruption in service or with minor temporary interruption in service. Under a Level 2 Earthquake, it must be shown that the structure will not collapse and a major oil spill will not occur (defined as 1,200 barrels of petroleum product), but the facility may receive repairable damage resulting in temporary closure. The response of the structure is assessed using 3D models of representative structures or structural portions.

conditioned. Therefore, the Commission finds that the proposed project, as conditioned, will minimize risk to life and property from hazards, consistent with Section 30253(a) of the Coastal Act.

H. PUBLIC ACCESS

Section 30210 of the Coastal Act requires that maximum public access shall be provided consistent with public safety needs and the need to protect natural resource areas from overuse. Section 30212 of the Coastal Act requires that access from the nearest public roadway to the shoreline be provided in new development projects, except where it is inconsistent with public safety, military security, or protection of fragile coastal resources, or where adequate access exists nearby. Section 30211 of the Coastal Act requires that development not interfere with the public's right to access gained by use or legislative authorization. Section 30214 of the Coastal Act provides that the public access policies of the Coastal Act shall be implemented in a manner that takes into account the capacity of the site and the fragility of natural resources in the area. In applying Sections 30210, 30211, 30212, and 30214, the Commission is also limited by the need to show that any denial of a permit application based on these sections or any decision to grant a permit subject to special conditions requiring public access is necessary to avoid or offset a project's adverse impact on existing or potential access.

The proposed dock seismic retrofit project would not adversely affect public access. The project would not displace any existing public access facilities, as the project would simply retrofit an existing dock facility that is located in a secured area where no public access currently exists. In addition, the project would not increase the demand for public access facilities, as it would involve no expansion of use, would not increase population density in the area, and would not otherwise draw more people to the waterfront. Therefore, the Commission does not find it necessary to require that public access be provided as a result of the proposed project. Furthermore, lateral access on the subject industrial parcel would be inconsistent with public safety needs and the security and operational needs of the oil storage facility.

The proposed project involves the removal of numerous piles from the bay. If the piles are only partially removed, or broken off during removal and left in the water, they could pose a safety and navigation hazard to boaters and other bay users. Therefore, to avoid adverse impact to public access and recreation on the bay from hazardous piles, the Commission attaches **Special Condition 6** to ensure that all piles that cannot be removed in their entirety are cut off one-foot below the mudline. The Commission thus finds that the proposed development, as conditioned, will not have any significant adverse effects on public access, and is consistent with the requirements of Coastal Act Sections 30210, 30211, 30212, and 30214.

I. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The Humboldt Bay Harbor, Recreation and Conservation District served as the lead agency for the project for CEQA purposes. The Harbor District adopted a Mitigated Negative Declaration for the project on June 23, 2016. Section 13906 of the Commission's administrative regulation requires Coastal Commission approval of CDP applications to be supported by a finding showing the application, as modified by any conditions of approval, is consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are any feasible

alternatives or feasible mitigation measures available, which would substantially lessen any significant adverse effect the proposed development may have on the environment.

The Commission incorporates its findings on Coastal Act consistency at this point as if set forth in full. As discussed above, the proposed project has been conditioned to be consistent with the policies of the Coastal Act. No public comments were received prior to preparation of the staff report. As specifically discussed in these above findings, which are hereby incorporated by reference, mitigation measures that will minimize or avoid all significant adverse environmental impacts have been required. As conditioned, there are no other feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impacts which the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, can be found consistent with the requirements of the Coastal Act to conform to CEQA.

APPENDIX A
SUBSTANTIVE FILE DOCUMENTS

Application File for Coastal Development Permit No. 1-00-013.

Application File for Coastal Development Permit Waiver No. 1-14-1587-W.

Application File for Coastal Development Permit No. 1-14-0773.

Application File for Coastal Development Permit No. 1-16-0049.

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Fisheries Hydroacoustic Working Group. (2008, June 12). Agreement in principal for interim criteria for injury to fish from pile driving activities. Available online at: http://www.dot.ca.gov/hq/env/bio/files/fhwgcriteria_agree.pdf.

Hastings, M. C. and A. N. Popper. (2005, January 28). Effects of Sound on Fish. Prepared for the California Department of Transportation. Sacramento, CA.

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National Marine Fisheries Service. (2014, October). California Eelgrass Mitigation Policy and Implementing Guidelines.

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DEL NORTE
Redwood NP
Stone Lagoon
Big Lagoon
Patrick's Pt.
Big Lagoon Rancheria
City of Trinidad
Trinidad Rancheria
City of McKinleyville
Blue Lake Rancheria
OCEAN
Project Location
Arcata Bay
City of Arcata
Humboldt Bay
City of Eureka
HUMBOLDT
Table Bluff Reservation
Eel R
Bear River Band - Rohnerville Rancheria
City of Fortuna
PACIFIC
City of Ferndale
Cape Mendocino
King Range NCA
MENDOCINO
N
0 7 14 Miles
0 7 14 Kilometers
EXHIBIT NO. 1
APPLICATION 1-16-0049
CHEVRON
REGIONAL LOCATION MAP

EXHIBIT NO. 2

APPLICATION 1-16-0049
CHEVRON
VICINITY MAP

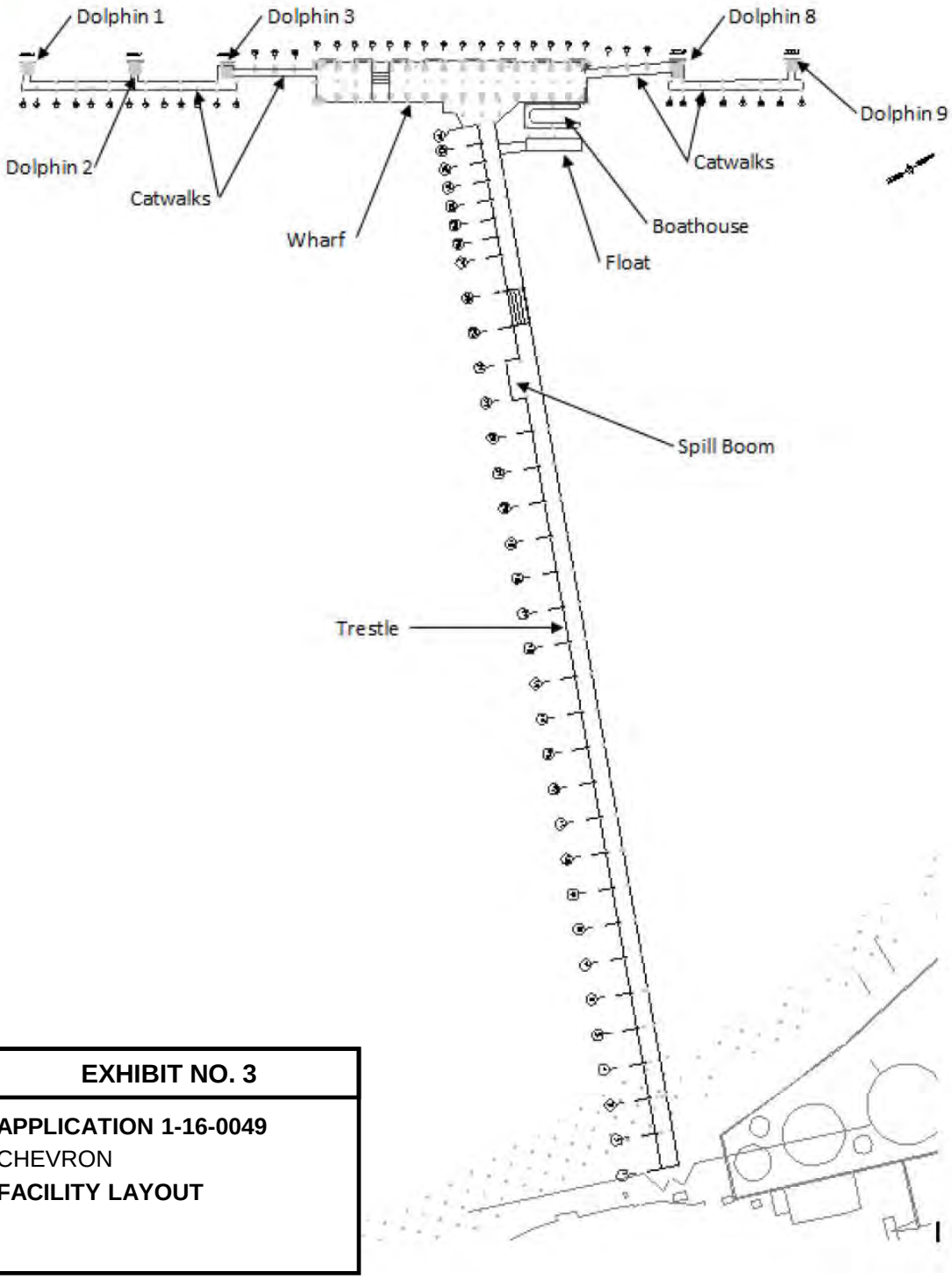


EXHIBIT NO. 3

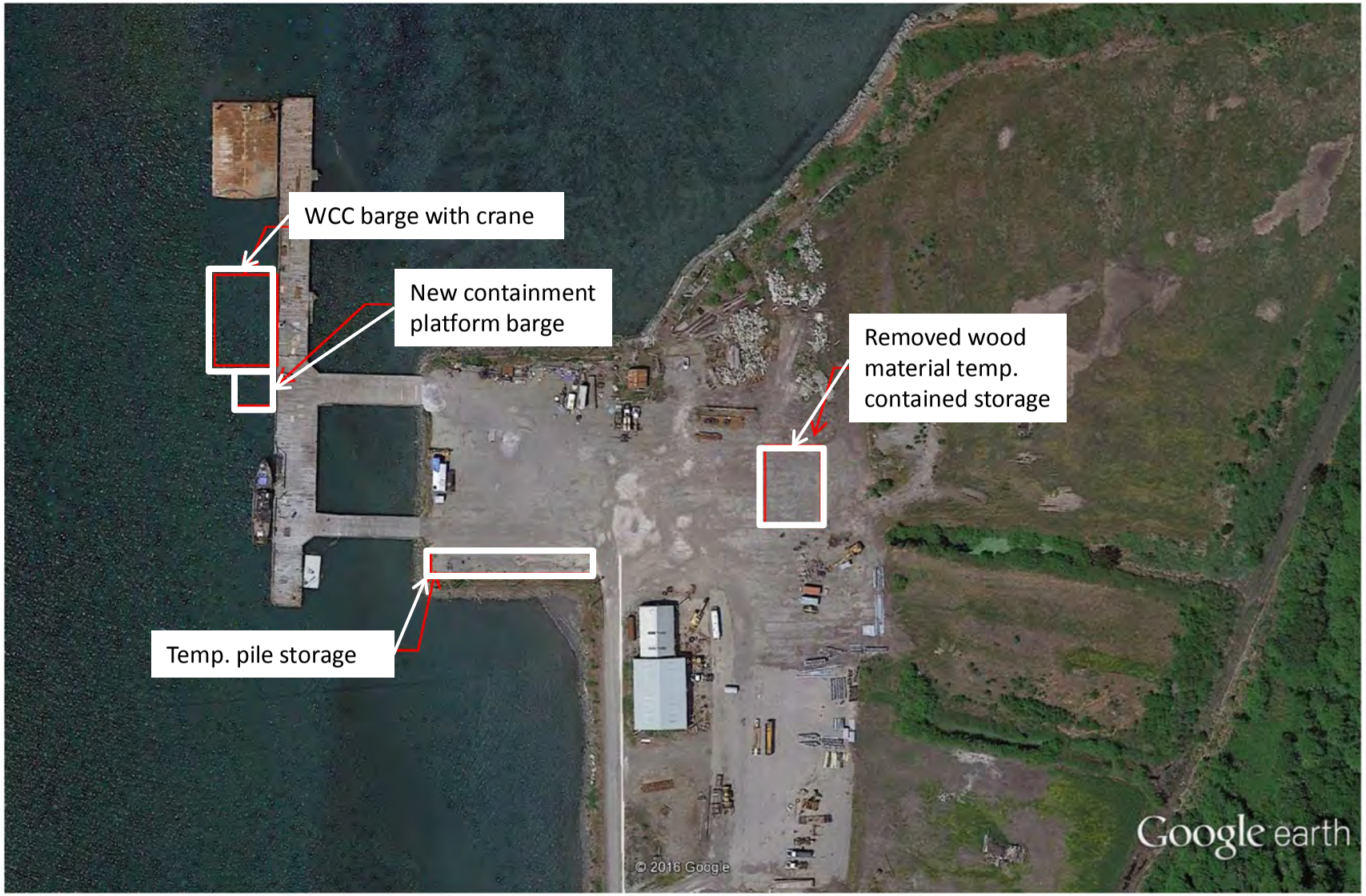
APPLICATION 1-16-0049
CHEVRON
FACILITY LAYOUT

Bing maps

STAGING AREA: Humboldt Bay Forest Products Dock in Fields Landing, Humboldt County

EXHIBIT NO. 4

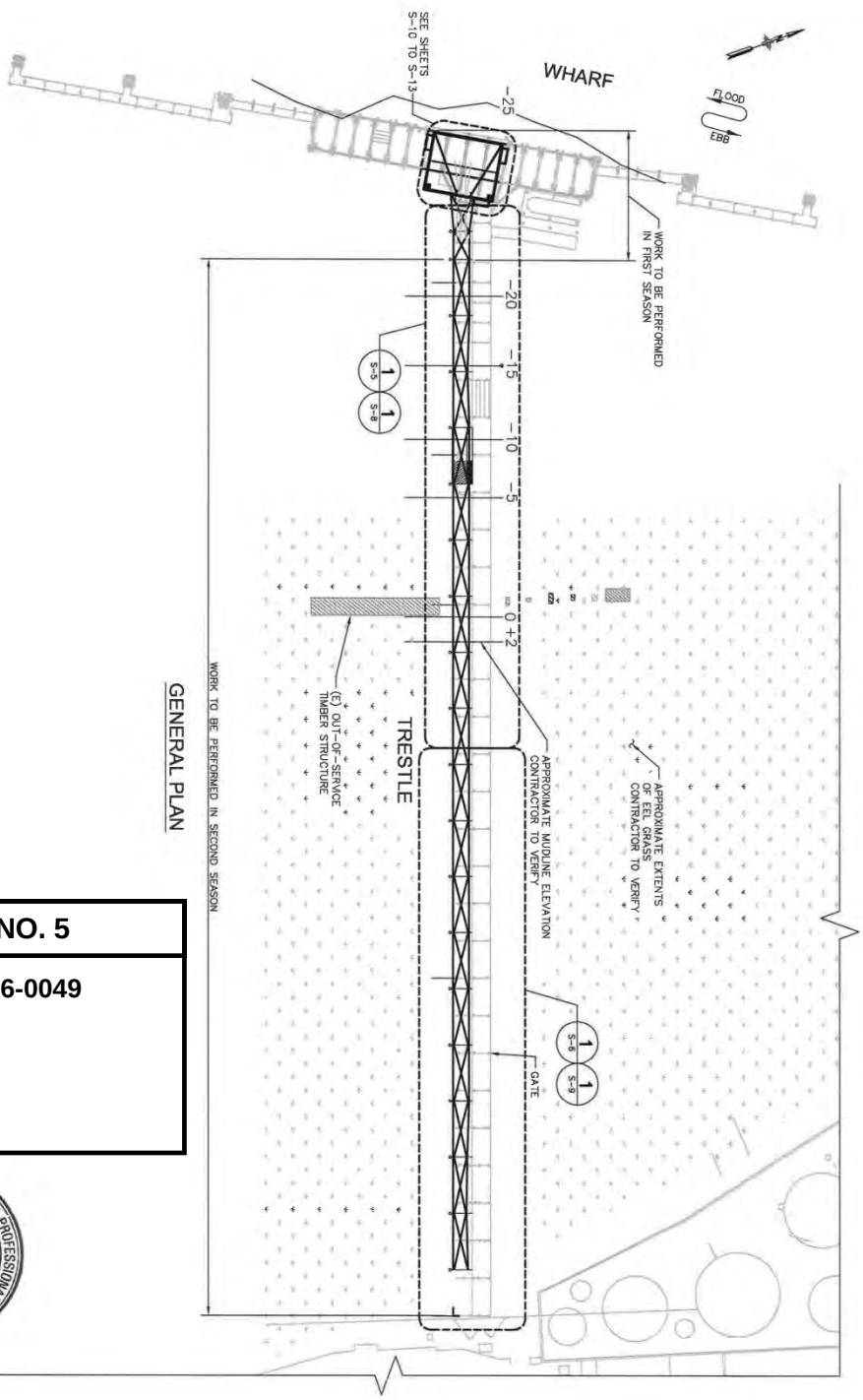
APPLICATION 1-16-0049
CHEVRON
PROJECT STAGING AREA
1 of 2



Google earth

feet 1000
meters 300

Plan provided by West Coast Contractors, Inc.



GENERAL PLAN

EXHIBIT NO. 5

APPLICATION 1-16-0049
CHEVRON
PROJECT PLANS
1 of 10

REGISTERED PROFESSIONAL ENGINEER
ROD K. IWASHITA
No. C 51581
CIVIL
STATE OF CALIFORNIA
Exp. 6/30/16
12/30/15

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

mofatt & nichol
2185 N. CALIFORNIA BLVD., SUITE 500
WALNUT CREEK, CA 94596

THIS IS AN AUTOCAD DRAWING. DO NOT REVISE MANUALLY.

REVISIONS				
0 ISSUED FOR CONSTRUCTION	AA	MP	RI	
12-31-15	ZP	–	–	

Chevron

SCALE AS NOTED DR. AA DR. APP. ____ DATE ____
ENGR. ____ ENGR. DEPT. ____
DPW'G. DEPT. ____
APPROVED

12/31/15

GENERAL PLAN
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION

M W. O. ____ S. O. ____

S-4

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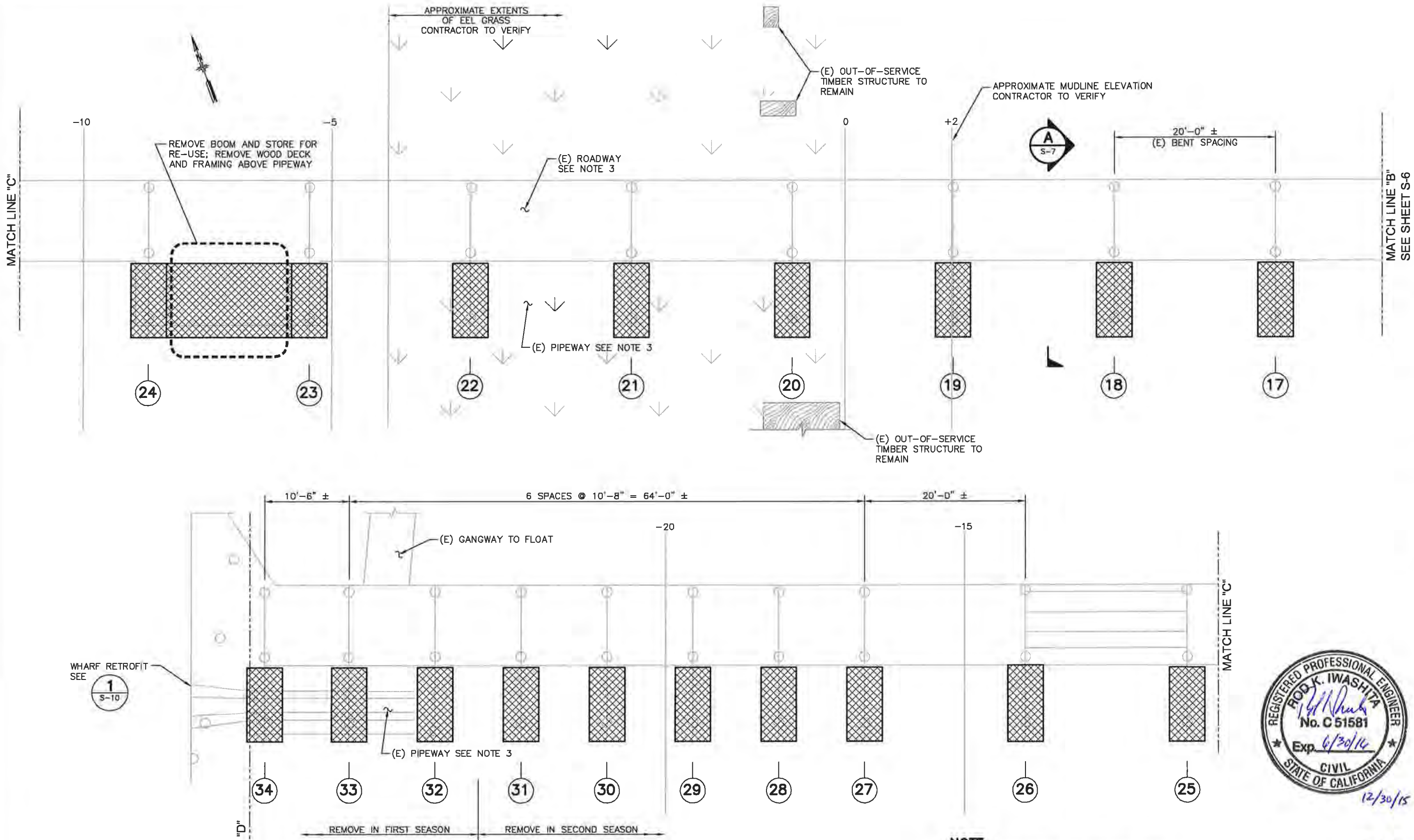

1 S-4 **PIPEWAY REMOVAL PLAN**
SCALE: 1:60

NOTE:

1. ALL WORK SHOWN ON THIS SHEET SHALL BE PERFORMED IN SECOND SEASON UON.
2. CONTRACTOR TO VERIFY PILE LOCATIONS.
3. ROADWAY TRESTLE FRAMING & PIPING NOT SHOWN FOR CLARITY

LEGEND:

REMOVE PILECAP, BRACE, AND PILE AFTER INSTALLATION OF NEW PIPEWAY SUPPORT BENT AND PRIOR TO INSTALLATION OF CABLE.

6' 0 6' 12'
SCALE: 1:60

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

REGISTERED PROFESSIONAL ENGINEER
ROD K. IWASHITA
No. C 51581
Exp. 6/30/16
CIVIL
STATE OF CALIFORNIA
12/30/15

moffatt & nichol
2185 N. CALIFORNIA BLVD., SUITE 500
WALNUT CREEK, CA 94596

REVISIONS

AA	MP	RI	
ZP	-	-	
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PIPEWAY REMOVAL PLAN SHEET 1 OF 2
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION

S-5
M
W. D.
S. D.

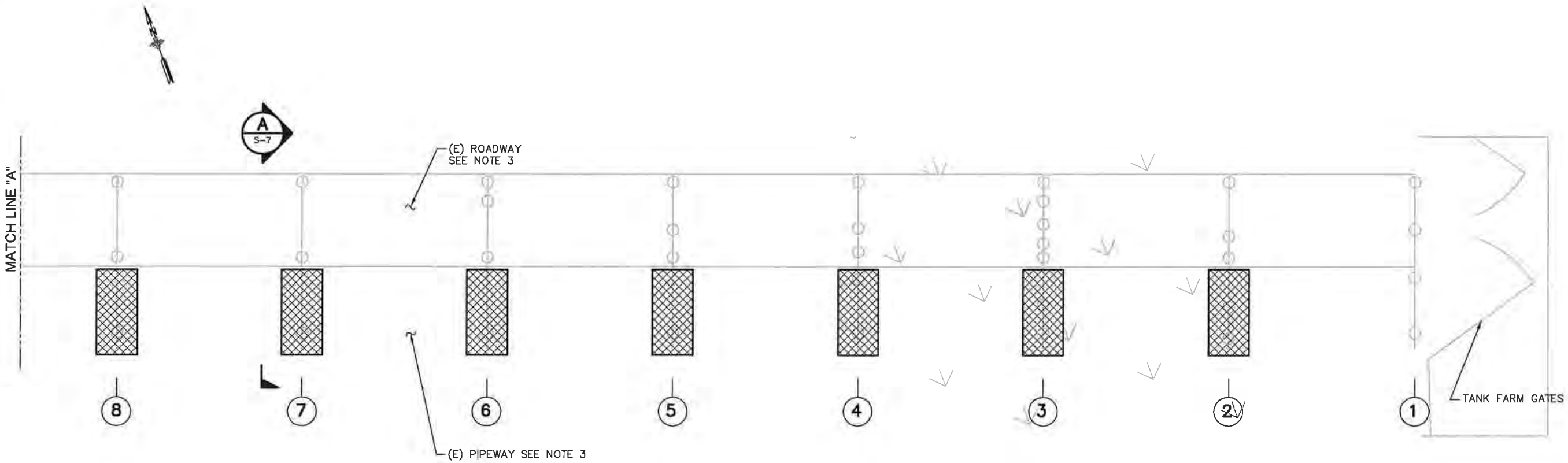
12/31/15

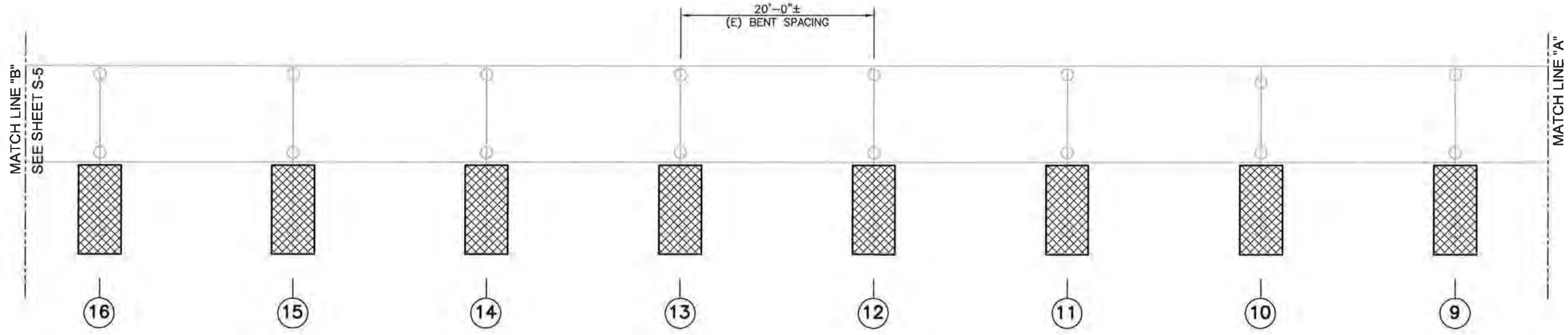
Chevron

APPROVED
DATE
DR. AA DR. APP.
ENGR. DEPT.
SCALE: AS NOTED
DR'G. NO.

2 of 10

P:\6178-04 Chevron Eureka Seismic Retrofit\3_CADD\617800_S-005.dwg Dec 29, 2015 - 10:24am





1 / S-4 **PIPEWAY REMOVAL PLAN**
SCALE: 1:60

REGISTERED PROFESSIONAL ENGINEER
ROD K. IWASHITA
No. C 51581
Exp. 6/30/16
CIVIL
STATE OF CALIFORNIA
12/30/15

NOTE:

1. ALL WORK SHOWN ON THIS SHEET SHALL BE PERFORMED IN SECOND SEASON UON.
2. CONTRACTOR TO VERIFY PILE LOCATIONS.
3. ROADWAY TRESTLE FRAMING & PIPING NOT SHOWN FOR CLARITY

LEGEND:

REMOVE PILECAP, BRACE, AND PILE AFTER INSTALLATION OF NEW PIPEWAY SUPPORT BENT AND PRIOR TO INSTALLATION OF CABLE.

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6' 0 6' 12'
SCALE: 1:60

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

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PIPEWAY REMOVAL PLAN SHEET 2 OF 2
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION

S-6

V. D. —
S. D. —

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DR. AA DR. APP. DATE
ENGR. ENGR. DEPT.
SCALE AS NOTED
DR'G. DEPT.

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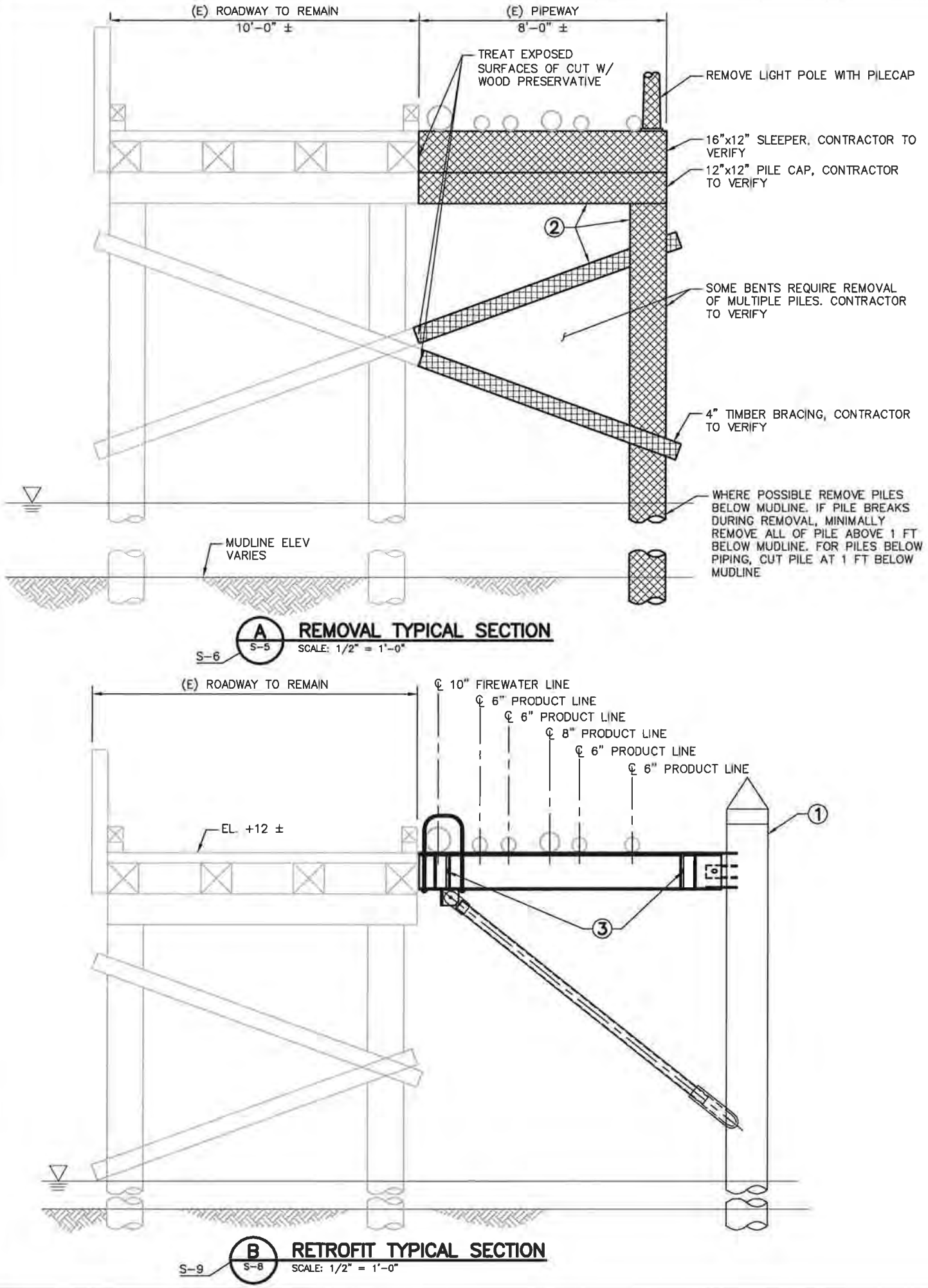
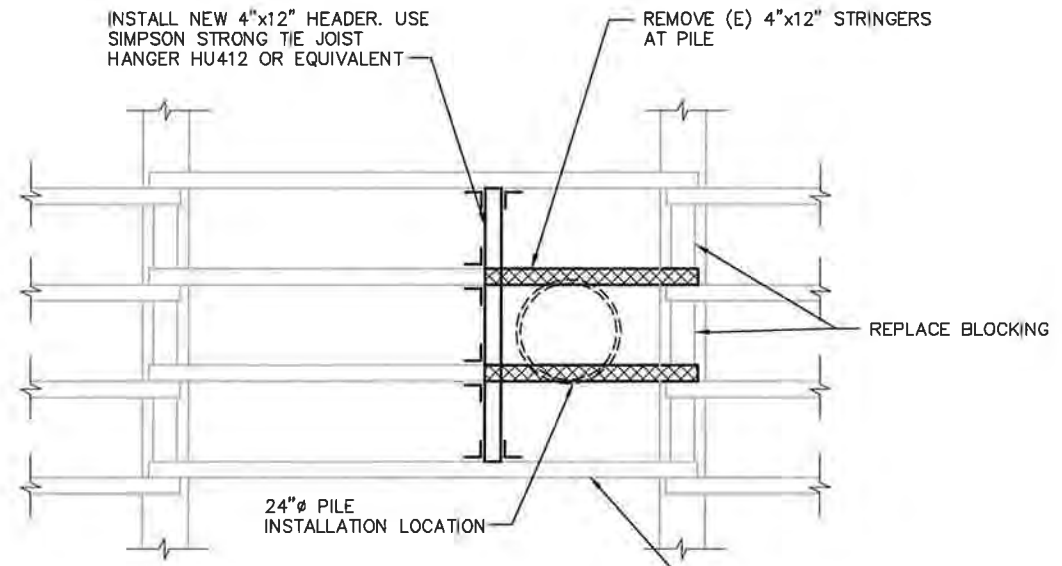


A S-5 — S-6 **REMOVAL TYPICAL SECTION**
SCALE: 1/2" = 1'-0"

B S-8 — S-9 **RETROFIT TYPICAL SECTION**
SCALE: 1/2" = 1'-0"



1 S-10 — S-11 **DETAIL**
SCALE: 1/2" = 1'-0"

NOTES:

① INSTALL NEW PIPEWAY SUPPORTS (PILE, BEAM, AND BRACE)

② REMOVE PILECAP, PILE, BRACE, AND LIGHT POLES (TIMBER BRACES, AND LIGHT POLES AS INDICATED)

③ INSTALL CABLES. SEE SHEET S-18 FOR DETAILED INSTALLATION ORDER

LEGEND:

INDICATES STRUCTURE REMOVAL

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2'-0" 0'-0" 2'-0" 4'-0"
SCALE: 1/2"=1'-0"

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

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TYPICAL TRESTLE AND RETROFIT SECTIONS AND DETAILS
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION

S-7

M — W. D. — S. D.

12/31/15

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DR. AA — DR. APP. — DATE
SCALE AS NOTED — ENGR. — DEPT.
DPM'R G. — DEPT.

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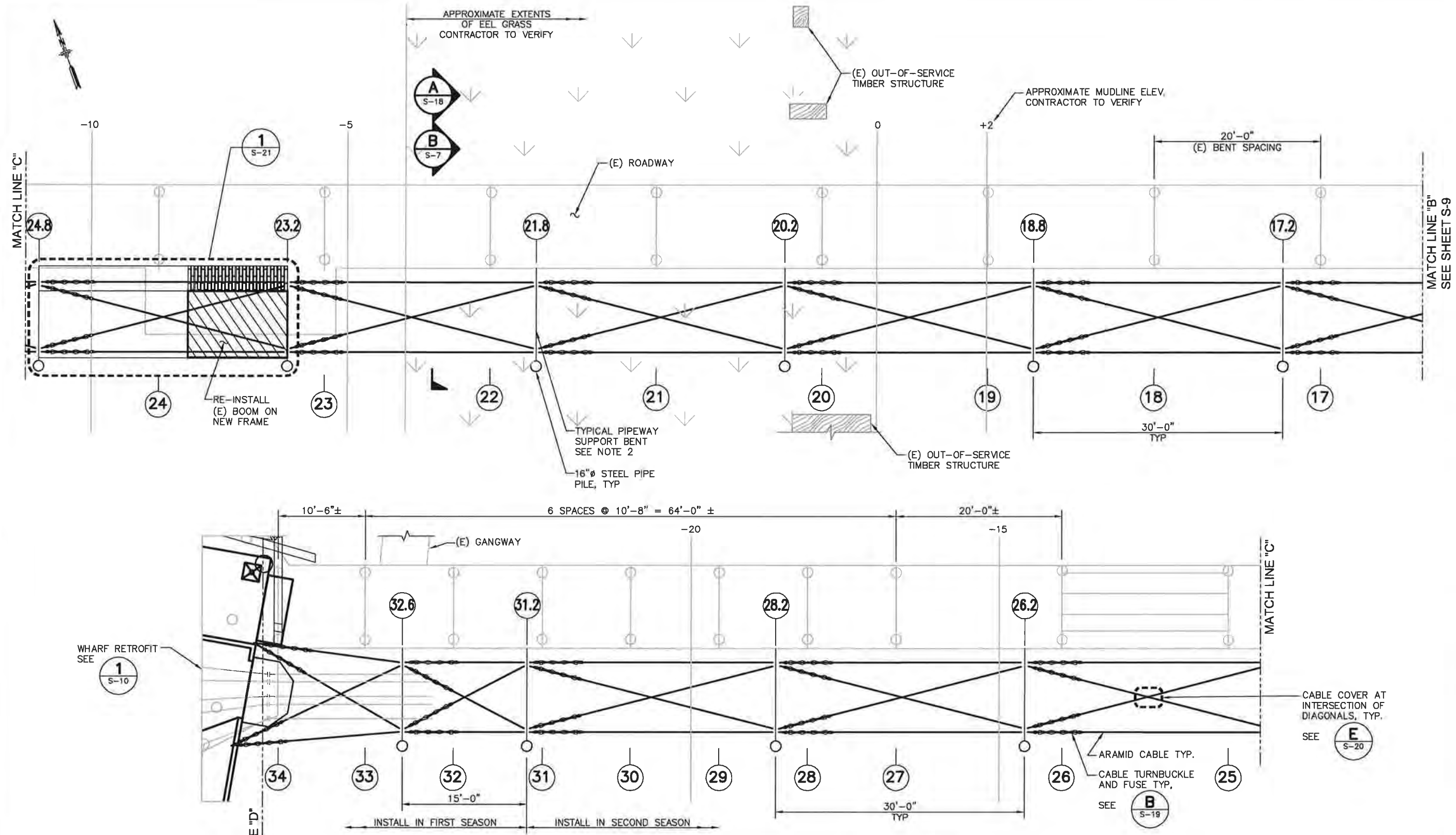

1 S-4 **PIPEWAY RETROFIT PLAN**
SCALE: 1:60

PIPEWAY RETROFIT
INSTALLATION PLAN CONSTRUCTION STAGING

1. SEASON 1
   - 1.1. INSTALL PIPEWAY RETROFIT BENTS 31.2 AND 32.6 FOLLOWING UNLOADING PLATFORM RETROFIT.
   - 1.2. REMOVE (E) PILECAPS, BRACE, AND PILE AT BENTS 32, 33 AND 34.
   - 1.3. INSTALL ARAMID CABLES BETWEEN BENT 31.2 AND UNLOADING PLATFORM.
2. SEASON 2
   - 2.1. INSTALL REMAINING PIPEWAY RETROFITS.
   - 2.2. REMOVE REMAINING PILECAPS, BRACE, AND PILE AT BENTS 2 TO 31.
   - 2.3. INSTALL ARAMID CABLES BETWEEN BENT 2.2 AND 31.2.

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NOTE:

1. SEE S-24 FOR PILE SCHEDULE AND CATHODIC PROTECTION.
2. PIPING NOT SHOWN FOR CLARITY
3. ARAMID CABLES SHALL BE MANUFACTURED BASED ON SPACING OF INSTALLED BENTS

6' 0 6' 12'
SCALE: 1:60

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

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94596

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PIPEWAY RETROFIT PLAN SHEET 1 OF 2
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION

S-8

W. O. M
S. O.

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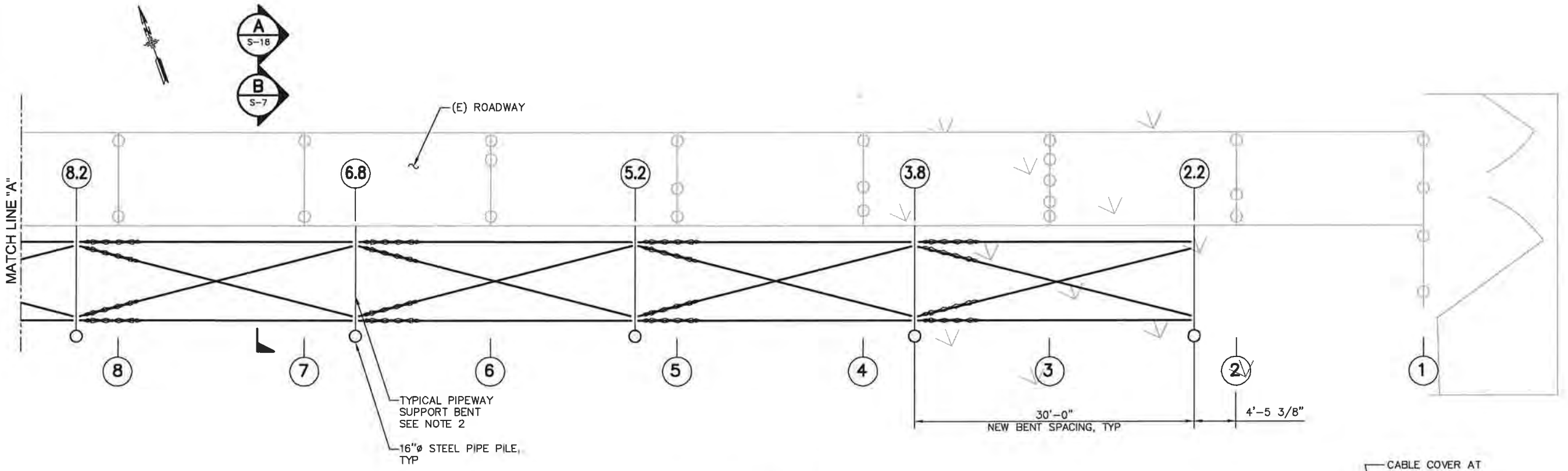

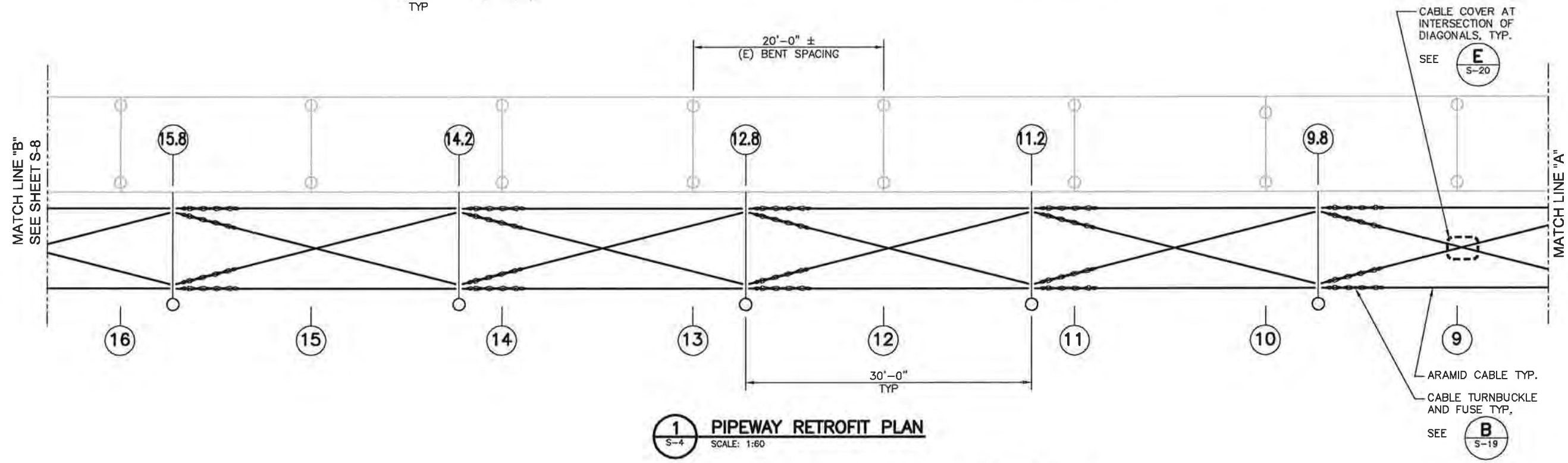

1 S-4 **PIPEWAY RETROFIT PLAN**
SCALE: 1:60

REGISTERED PROFESSIONAL ENGINEER
ROD K. IWASHITA
No. C 51581
Exp. 4/30/16
CIVIL
STATE OF CALIFORNIA
12/30/15

NOTE:

1. SEE S-24 FOR PILE SCHEDULE AND CATHODIC PROTECTION.
2. PIPING NOT SHOWN FOR CLARITY
3. ARAMID CABLES SHALL BE MANUFACTURED BASED ON SPACING OF INSTALLED BENTS
4. FOR CONSTRUCTION STAGING SEE SHEET S-8

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6' 0 6' 12'
SCALE: 1:60

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

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PIPEWAY RETROFIT PLAN SHEET 2 OF 2
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION

S-9
M W. O. S. O.

12/31/15 APPROVED

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SCALE AS NOTED DR. AA DR. APP. DATE
ENGR. DEPT.
DPR'G. DEPT.

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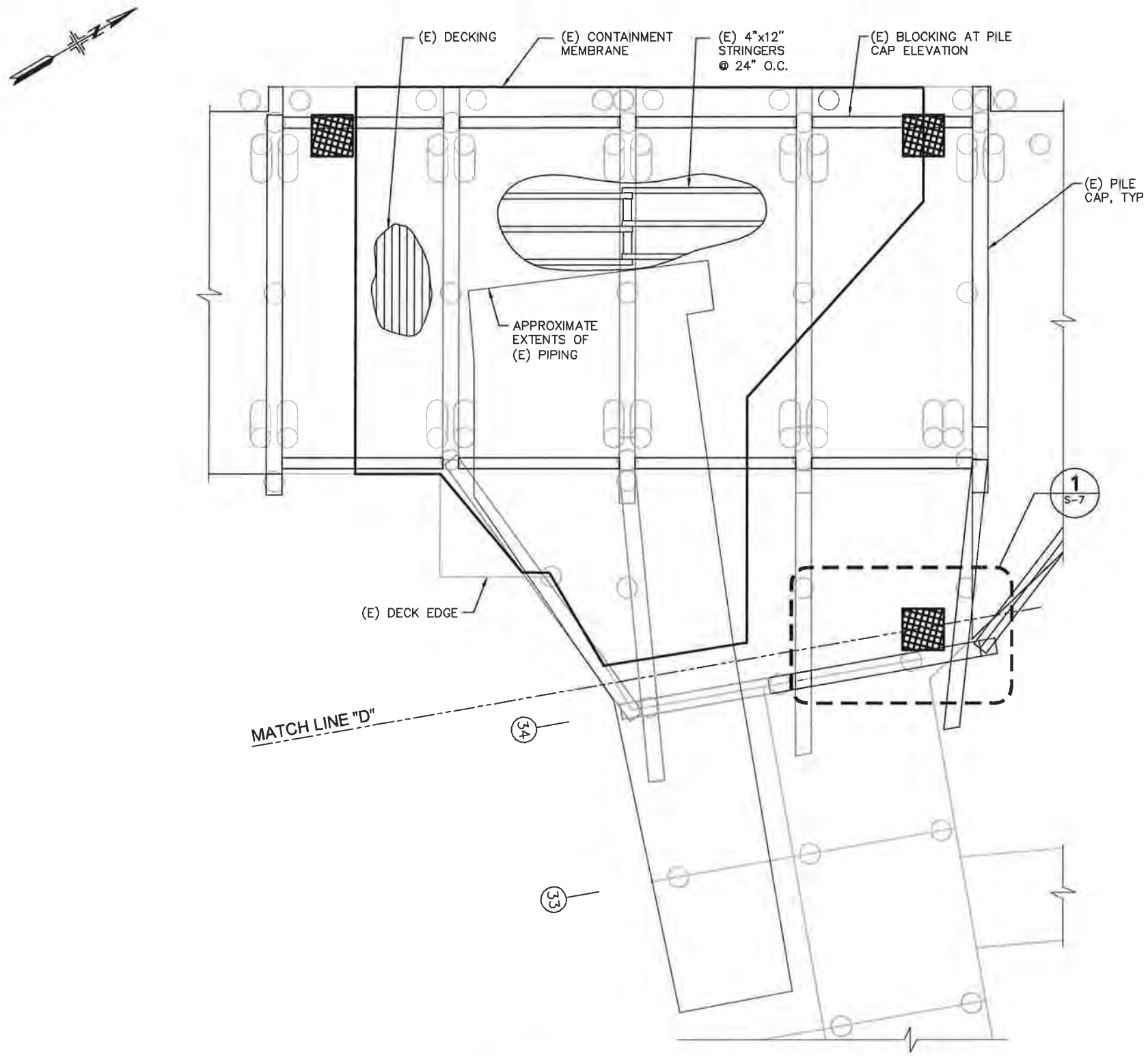

NOTE: PERFORMED PRIOR TO FACILITY SHUT DOWN

1 / S-4 **REMOVE DECK AT NEW PILES**

SCALE: 1/4" = 1'-0"

UNLOADING PLATFORM RETROFIT
INSTALLATION PLAN CONSTRUCTION STAGING

1. PHASE I (BEFORE SHUT DOWN)

1.1. RELOCATE AFFECTED UTILITIES, SEE SHEET E-1
1.2. OPEN DECK, REMOVE PLANKS AND STRINGERS AS REQUIRED AND ADD FRAMING TO TRANSFER LOADS, SEE SHEET S-7
1.3. DRIVE NEW STEEL PILES
1.4. CUT PILE TO GRADE
1.5. INSTALL PILE TOP PLATE
1.6. SURVEY PILE TOP PLATE CENTER FOR HORIZONTAL AND VERTICAL CONTROL. PROVIDE LOCATIONS TO PLATFORM FABRICATOR TO INCORPORATE INTO PREFABRICATED CONSTRUCTION
1.7. INSTALL TEMPORARY DECKING / BARRIERS AT OPENINGS
1.8. INSTALL TEMPORARY CONTAINMENT BERM AS NECESSARY
1.9. [OPTIONAL] REMOVE NON LOAD BEARING BATTER PILES AND FENDER PILES. REMOVE ASSOCIATED BLOCKING.

2. PHASE II (DURING SHUT DOWN)

2.1. CLEAR AND REMOVE PIPING UP TO (E) FLANGES, STORE PIPING FOR LATER REINSTALLATION. REMOVE (E) RAINWATER CATCH BASIN PUMP SYSTEM. IF INTENDING TO RE-USE, SAVE ALL COMPONENTS
2.2. REMOVE CONTAINMENT, DECKING, STRINGERS, PILE CAPS, AND REMAINING TIMBER PILES
2.3. INSTALL PREFABRICATED UNLOADING PLATFORM AND WELD TO PILE CAP PLATES
2.4. INSTALL ACCESS RAMPS

3. PHASE III (POST RETURN TO OPERATIONS)

3.1. REROUTE UTILITIES
3.2. INSTALL VEHICLE BARRIER
3.3. INSTALL CABLING TO PIPEWAY RETROFIT BENTS
3.4. INSTALL PERMANENT GUARD RAILS ALONG CUT EDGE OF (E) WHARF
3.5. INSTALL BLOCKING AT EXPOSED EDGE OF STRINGERS ALONG CUT EDGE OF (E) WHARF

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LEGEND:

REMOVE DECKING AND STRINGER AS NECESSARY. ADD BLOCKING AT STRINGERS AS NEEDED TO TRANSFER LOAD.

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4'-0" 0'-0" 4'-0" 8'-0"
SCALE: 1/4"=1'-0"

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

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UNLOADING PLATFORM INSTALLATION PLAN SHEET 1 OF 3
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION
S-10
W. D. M S. D.
12/31/15
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Chevron
DR. AA DR. APP. DATE
ENGR. DEPT.
SCALE: AS NOTED ENGR. DPR'G. DEPT.

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AA MP R1 -
ZP -
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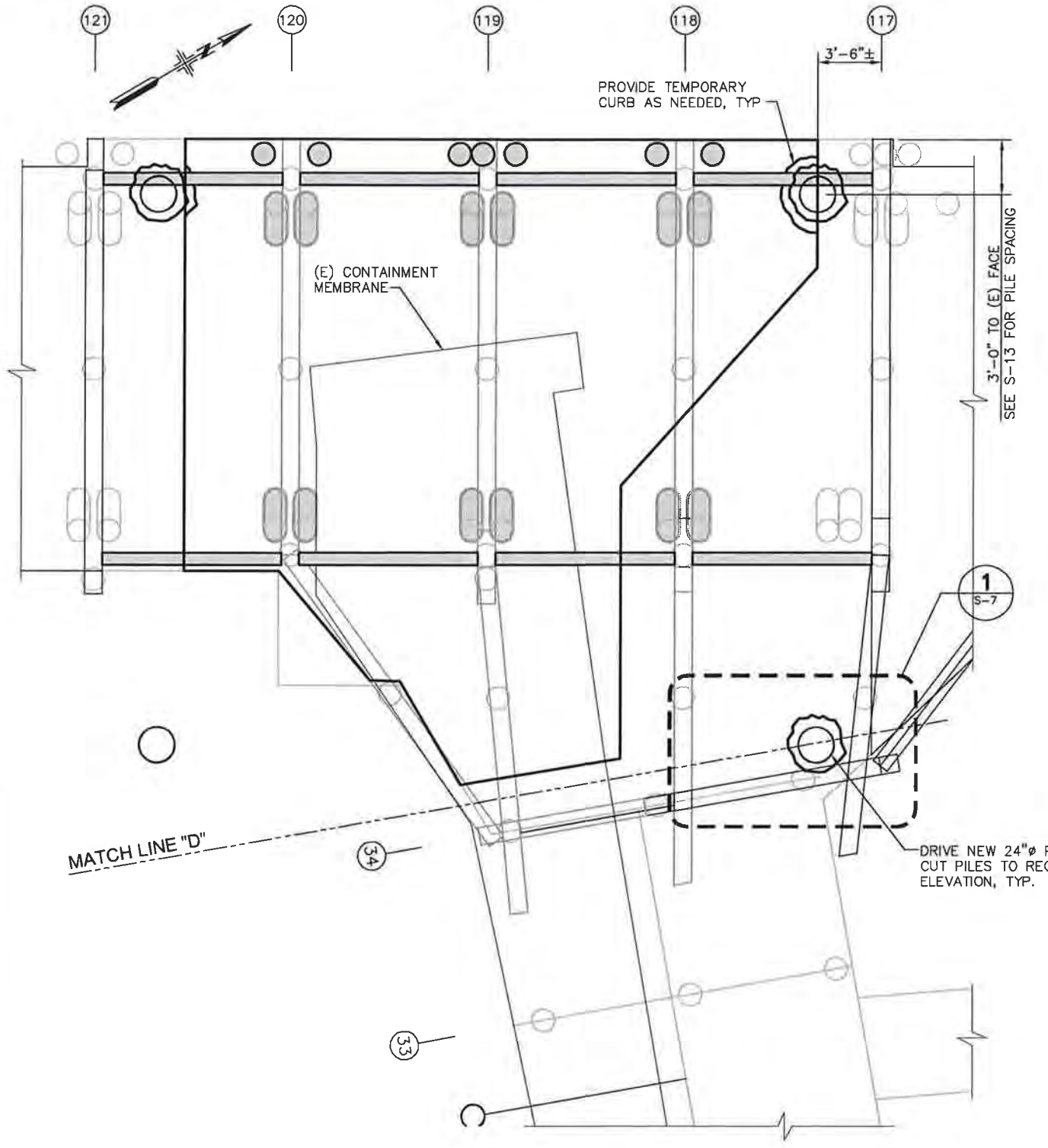


NOTE: PERFORMED PRIOR TO FACILITY SHUT DOWN

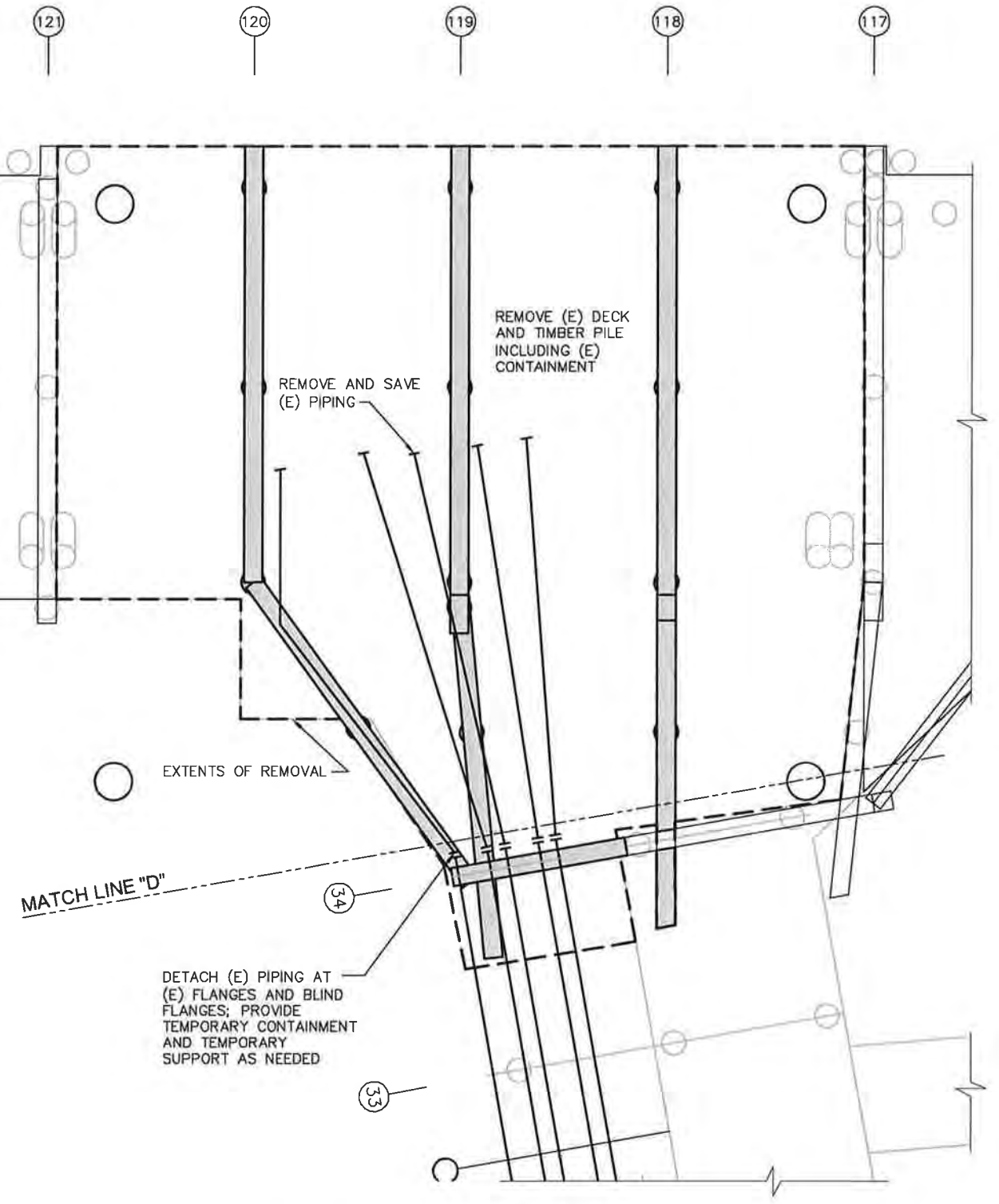
1 / S-4 INSTALL NEW PILES

SCALE: 1/4" = 1'-0"

NOTE: OPTIONAL – REMOVE BATTER PILE, FENDER PILE, BLOCKING, AND HEADER PRIOR TO SHUT DOWN.

NOTE:

SEE S-24 FOR PILE SCHEDULE AND CATHODIC PROTECTION.



NOTE: PERFORMED DURING FACILITY SHUT DOWN

2 / S-4 REMOVE (E) STRUCTURE

SCALE: 1/4" = 1'-0"

NOTE: REMOVE DURING SHUT DOWN.

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4'-0" 0'-0" 4'-0" 8'-0"

SCALE: 1/4"=1'-0"

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

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UNLOADING PLATFORM INSTALLATION PLAN SHEET 2 OF 3
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION

S-11

M
W. O.
S. O.

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ENGR.
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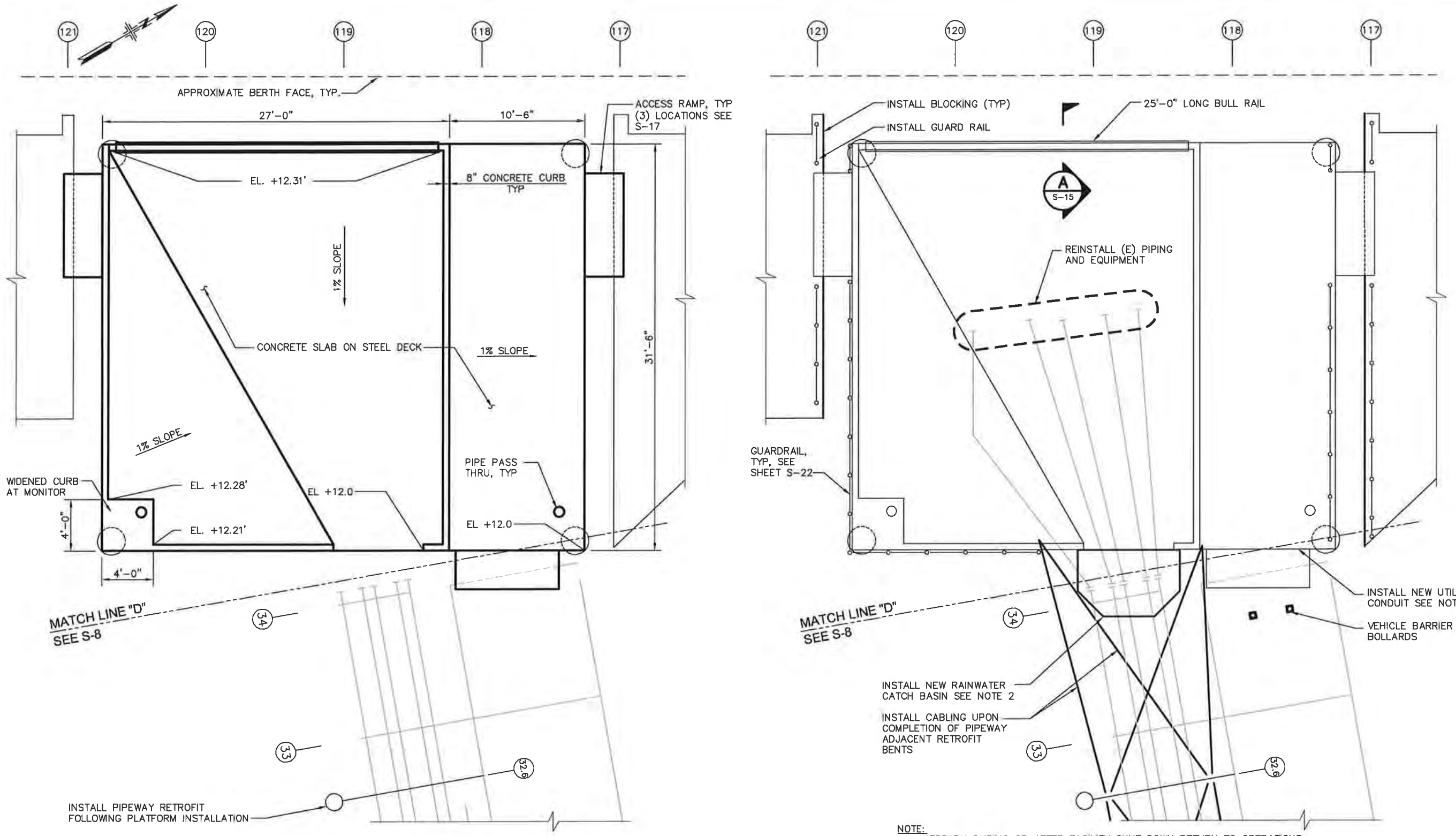

NOTE: PERFORM DURING FACILITY SHUT DOWN

1 / S-4 INSTALL NEW PLATFORM
SCALE: 1/4" = 1'-0"

NOTE:
1. PERFORM DURING OR AFTER FACILITY SHUT DOWN RETURN TO OPERATIONS
2. INSTALL (E) OR NEW RAINWATER CATCH BASIN PUMP SYSTEM AFTER COMPLETING INSTALLATION OF BASIN. IF NEW PUMP IS USED, REPLACEMENT PUMP SHALL HAVE MINIMUM RATED FLOW RATE OF 18 GPM. FLOW RATE SHALL NOT EXCEED 40 GPM.
3. NEW UTILITY CONDUIT; RECONNECT TO (E) CONDUIT TO REMAIN. PROVIDE 36" MINIMUM LENGTH SEAL TIGHT FLEXIBLE METAL CONDUIT CONNECTION BETWEEN STRUCTURES FOR EACH CONDUIT TO BE RECONNECTED. PROVIDE STAINLESS STEEL STRAIN RELIEF AT EACH END OF THE FLEXIBLE CONDUIT CONNECTIONS.

2 / S-4 COMPLETION
SCALE: 1/4" = 1'-0"

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4'-0" 0'-0" 4'-0" 8'-0"
SCALE: 1/4"=1'-0"

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

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UNLOADING PLATFORM INSTALLATION PLAN SHEET 3 OF 3
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION

S-12
M
W. D.
S. D.

12/31/15

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ENGR. DEPT.
OPR'G. DEPT.
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DR. AA

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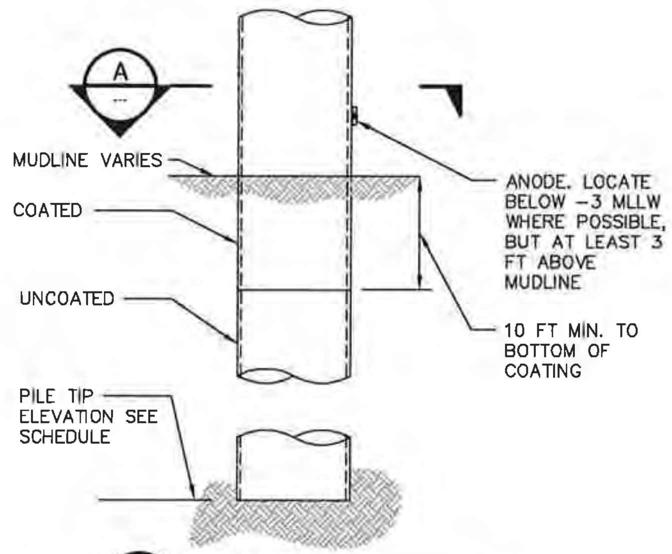
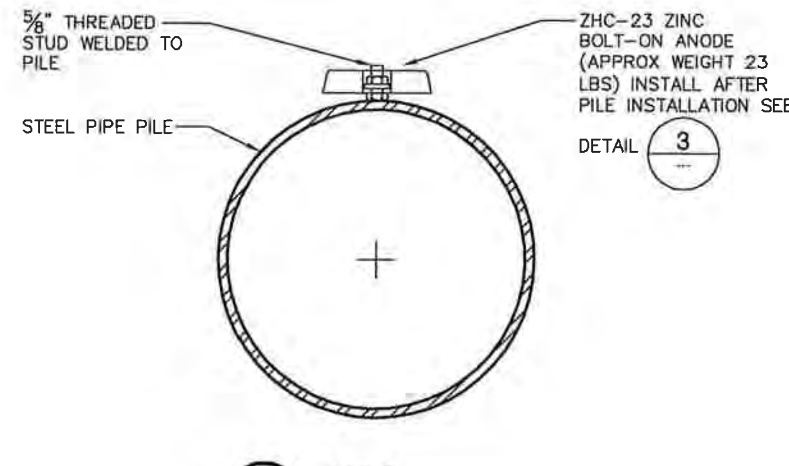
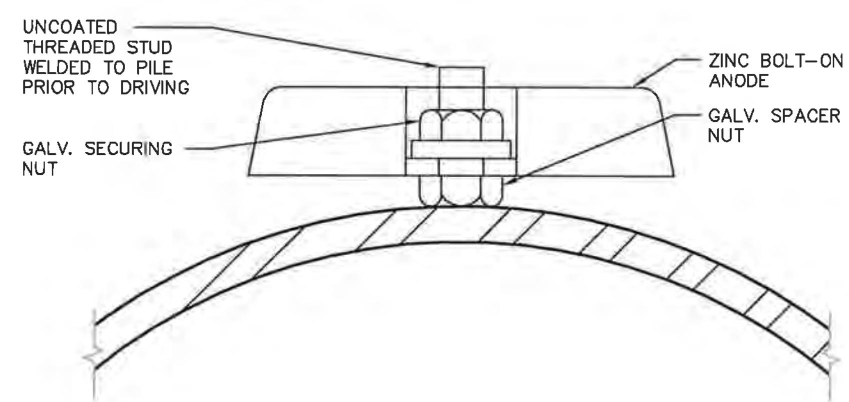


2 — **PILE ELEVATION**
SCALE: NTS



A — **SECTION**
SCALE: NTS



3 — **DETAIL**
SCALE: NTS

NOTES:

1. ACOUSTIC MITIGATION (SUCH AS BUBBLE CURTAIN OR BUBBLE SHEETS) SHALL BE PROVIDED DURING PILE DRIVING OPERATIONS WITHIN THE WATER COLUMN. ACOUSTIC MITIGATION MEASURES SHALL SATISFY THE REQUIREMENTS OF PERMITTING AGENCIES.
   1.1. WHERE POSSIBLE, DRIVE PILES WHILE TIDE IS OUT AND NO PILE DRIVING OPERATIONS OCCUR WITHIN THE WATER COLUMN. PILE DRIVING OUTSIDE THE WATER COLUMN DOES NOT REQUIRE ACOUSTIC MITIGATION.
2. AT CONTRACTORS DISCRETION, 24" ø PILES MAY BE DRIVEN WITH VIBRATORY HAMMER TO AN ELEVATION 10 FT BELOW THE DEFINED PILE TIP ELEVATION WITH NO RE-STRIKE WITH AN IMPACT HAMMER REQUIRED. IF VIBRATORY DRIVING FAILS TO MEET THIS TIP ELEVATION THEN IMPACT HAMMER DRIVING TO THE DEFINED PILE TIP ELEVATION WITH MINIMUM ACCEPTABLE HAMMER BLOW COUNT AT THE END OF THE DRIVING IS REQUIRED.
3. 16" ø PILES MAY BE DRIVEN WITH VIBRATORY OR IMPACT HAMMER TO DEFINED PILE TIP ELEVATION. MINIMUM ACCEPTABLE HAMMER BLOW COUNT IS NOT REQUIRED. IF VIBRATORY DRIVING FAILS TO MEET THE DEFINED TIP ELEVATION THEN IMPACT HAMMER DRIVING IS REQUIRED UNTIL THE TIP ELEVATION IS REACHED OR THE MINIMUM ACCEPTABLE HAMMER BLOW COUNTS IS REACHED.
4. PILE COATING SHALL EXTEND AT LEAST 10 FT BELOW THE MUDLINE ELEVATION (TO BE VERIFIED BY CONTRACTOR). UNCOATED LENGTH OF PILE SHALL BE PROTECTED AGAINST CORROSION PRIOR TO PILE DRIVING.
5. PILE SPLICING IS PROHIBITED.

PILE SCHEDULE:

BENT	PILE Ø (IN)	PILE THICKNESS (IN)	TOP OF PILE (FT MLLW)	APPROXIMATE MUDLINE * (FT MLLW)	TIP OF PILE (FT MLLW)	PILE LENGTH (FT)	ANODE REQUIRED
2.2	16	0.50	13.5	2.0	-36.5	50.0	NO
3.8	16	0.50	13.5	2.0	-36.5	50.0	NO
5.2	16	0.50	13.5	2.0	-36.5	50.0	NO
6.8	16	0.50	13.5	2.0	-36.5	50.0	NO
8.2	16	0.50	13.5	2.0	-36.5	50.0	NO
9.8	16	0.50	13.5	2.0	-36.5	50.0	NO
11.2	16	0.50	13.5	2.0	-46.5	60.0	NO
12.8	16	0.50	13.5	2.0	-46.5	60.0	NO
14.2	16	0.50	13.5	2.0	-46.5	60.0	NO
15.8	16	0.50	13.5	2.0	-46.5	60.0	NO
17.2	16	0.50	13.5	2.0	-46.5	60.0	NO
18.8	16	0.50	13.5	2.0	-46.5	60.0	NO
20.2	16	0.50	13.5	-1.1	-46.5	60.0	NO
21.8	16	0.50	13.5	-1.9	-46.5	60.0	NO
23.2	16	0.50	13.5	-6.3	-51.5	65.0	YES
24.8	16	0.50	13.5	-10.8	-51.5	65.0	YES
26.2	16	0.50	13.5	-14.6	-51.5	65.0	YES
28.2	16	0.50	13.5	-18.6	-51.5	65.0	YES
31.2	16	0.50	13.5	-19.9	-51.5	65.0	YES
32.6	16	0.50	13.5	-22.0	-51.5	65.0	YES
UNLOADING PLATFORM	24	0.75	8.2	-22.0	-61.8	70.0	YES

* CONTRACTOR TO VERIFY

REGISTERED PROFESSIONAL ENGINEER
ROD K. IWASHITA
No. C 51581
Exp. 6/30/16
CIVIL
STATE OF CALIFORNIA
12/30/15

moffatt & nichol
2185 N. CALIFORNIA BLVD., SUITE 500
WALNUT CREEK, CA 94596

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

THIS IS AN AUTOCAD DRAWING. DO NOT REVISE MANUALLY.

PILE SCHEDULE AND CATHODIC PROTECTION
CHEVRON EUREKA TERMINAL
PIPEWAY AND UNLOADING PLATFORM RETROFIT
TRANSPORTATION & OPERATION

Chevron

12/31/15 APPROVED

M W. O. ____ S. O. ____

S-24

SCALE AS NOTED DR. AA DR. APP. ____ DATE ____
ENGR. ____ ENGR. DEPT. ____
OPR'G. DEPT. ____

REVISIONS

		AA	MP	RI
0	ISSUED FOR CONSTRUCTION 12-31-15	ZP	-	-

P:\8178-04 Chevron Eureka Seismic Retrofit\3_CADD\817800_S-024.dwg Dec 30, 2015 - 10:41am

H. T. HARVEY & ASSOCIATES

Ecological Consultants

Chevron Eureka Terminal Seismic Retrofit Project
Underwater Noise and Marine Mammal Monitoring Plan

DRAFT

Project No. 3606-04

Prepared for:

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Eureka, CA 95501

Prepared by:

H. T. Harvey & Associates

EXHIBIT NO. 6
APPLICATION 1-16-0049 CHEVRON **EXCERPTS FROM HYDROACOUSTIC MONITORING PLAN – 1 of 11**

April 29, 2016

1125 16th Street, Suite 209 • Arcata, CA 95521 • Ph: 707.822.4141 • F: 707.822.4848

Section 3.0 Project Description

The project will be completed in two phases. Phase 1 (retrofit of the unloading platform) will occur between July 1, 2016, and October 15, 2016. Phase 2 (retrofit of the fuel transfer pipeway support system) will occur between July 1, 2017, and October 15, 2017. Pile removal and pile driving are component activities of both phases.

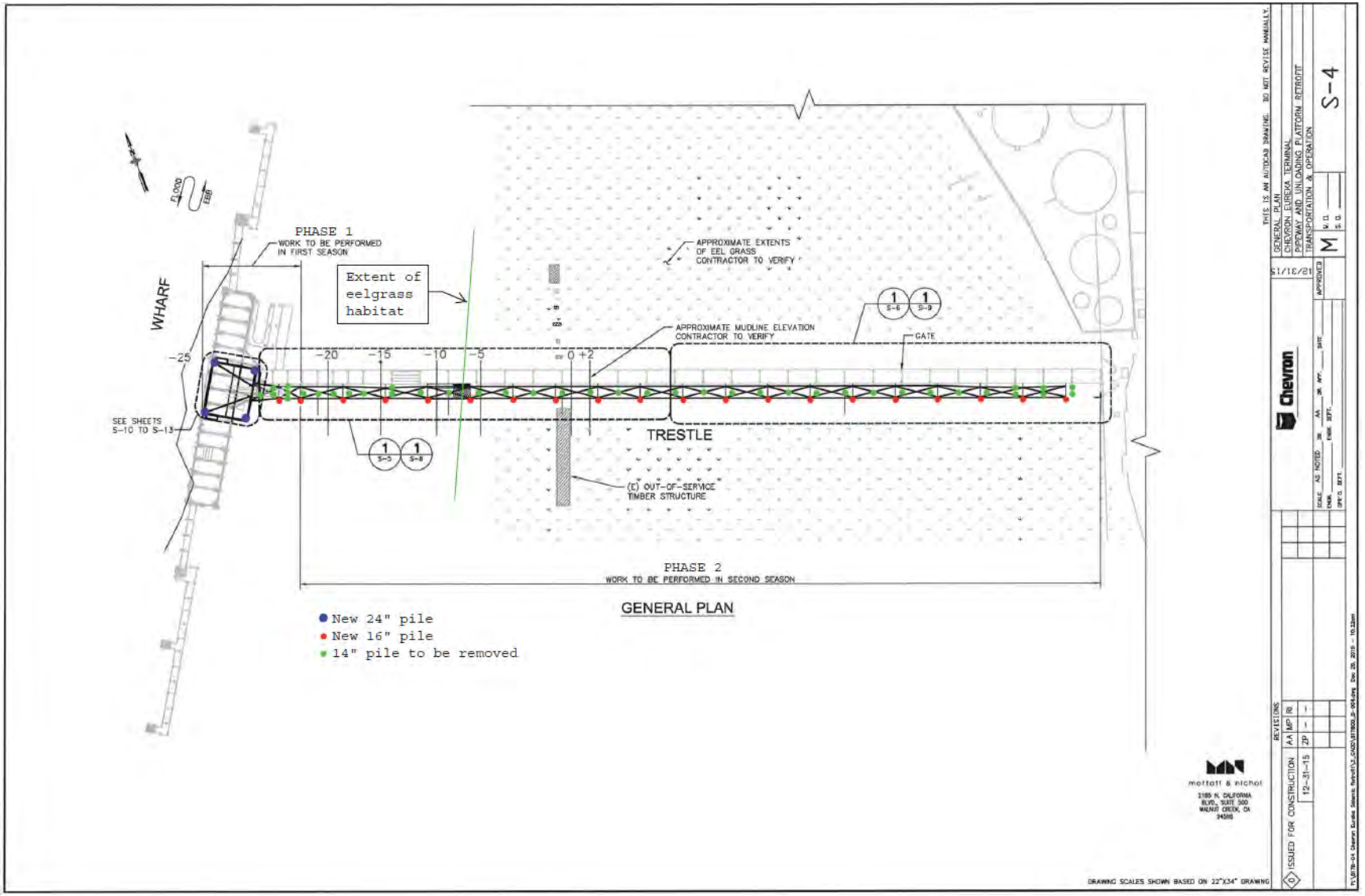
3.1 Phase 1

During Phase 1, 37 timber piles will be removed (31 from the wharf and 6 from the trestle), and six coated steel piles will be installed (Figure 2). Four of the steel piles will be 24-inch-diameter piles designed to support the new unloading platform. Two of the steel piles will be 16-inch-diameter piles that will be installed on the western end of the fuel pipeway. After the timber deck is removed to allow access to bent caps and piles, the timber piles will be removed using a vibrating hammer or a choker and cable. Timber piles will be completely removed when possible; however, if piles break during removal, the piece remaining will be cut off at least 12-inches below the mudline. The six steel piles will be driven to tip elevation or refusal using a crane and a vibratory hammer. If refusal occurs before tip elevation is reached, an impact pile-driving hammer will be used to drive the piles to the required tip elevation or minimum acceptable blow count, completing the installation.

3.2 Phase 2

During Phase 2, 34 timber piles that are remaining from the trestle will be removed, and eighteen 16-inch-diameter coated steel piles will be installed (Figure 2). Timber piles will be removed using a vibrating hammer or a choker and cable. Timber piles will be completely removed; however, if piles break during removal, the piece remaining will be cut off at least 12 inches below the mudline. All steel piles will be driven to tip elevation or refusal using a crane and a vibratory hammer. If refusal occurs before tip elevation is reached, an impact pile-driving hammer will be used to drive the piles to the required tip elevation, completing the installation.

Figure 2. Phase 1 and 2 General Plan



Section 4.0 Underwater Noise Generation

Sounds generated by pile removal and pile driving are transferred to the water column and may affect biological resources, including fish and marine mammals present in waters adjacent to the project site. Table 1 presents sound levels measured during pile driving for projects similar to the Terminal project. In some cases, unattenuated sound levels exceeded underwater thresholds for disturbance or injury to fish and marine mammals (discussed below). In-water sound thresholds for injury to fish have been identified by the Fisheries Hydroacoustic Working Group (Table 2). However, an Incidental Take Permit will be requested from the California Department of Fish and Wildlife to permit incidental take of longfin smelt (*Spirinchus thaleichthys*) that could occur if cumulative SEL exceeds 183 dB re: 1µPa²-sec during impact pile driving.

Table 1. Sound Pressure Levels Measured 10 Meters from Pile Driving

Project Location	Piling Type	Hammer Type	Water or Land Placement	Peak dB Unattenuated	SEL dB Unattenuated	Peak dB Attenuate (Bubble Curtain)	SEL dB Attenuated (Bubble Curtain)
Rodeo, California	24-inch pipe	Impact	Water	202–203	177–178	ND	ND
Lathrop, California	20-inch pipe	Impact	Water	204	172	ND	ND
Astoria, Oregon	24-inch pipe	Impact	Water	193–206	161–175	175–187	153–161
Stockton, California	16-inch pipe	Vibratory	Water	184–197	164–174	ND	ND
South Umpqua River, Oregon	24-inch pipe	Vibratory	Water	171–185	ND	ND	ND
Portage Bay, Washington	24-inch pipe	Vibratory	Water	170	144	ND	ND
Portage Bay, Washington	24-inch pipe	Impact	Water	186–193	155–165	161–165	146–148
Stockton, California	20-inch pipe	Impact	Land	196–198	167–171	ND	ND
Stockton, California	20-inch pipe	Impact	Water	206–208	175–176	197–201	171–175

Notes: dB = decibels; ND = no data; SEL = sound exposure level.

Source: Buehler et al. 2015.

Table 2. Underwater Sound Threshold Levels for Injury to Fish for Pile Driving

Interim Criteria for Injury	Underwater Noise Threshold
Peak	206 dB re: 1µPa for all fish sizes
Cumulative SEL	187 dB re: 1µPa²-sec for fish ≥ 2 grams 183 dB re: 1µPa²-sec for fish < 2 grams

Notes: µPa = microPascal; dB = decibels; SEL = sound exposure level.
Source: Fisheries Hydroacoustic Working Group 2008.

The thresholds presented in Table 2 were developed for impact pile driving only. They should not be used to assess sound from vibratory pile driving because the injury thresholds for impact driving are likely to be much lower than the injury thresholds for nonimpulsive, continuous sounds produced by vibratory drivers (Stadler pers. comm., as cited in Buehler et al. 2015).

Underwater sound thresholds related to the potential for disturbance or injury to marine mammals have been identified (Table 3) based on peak sound levels generated during vibratory and impact pile driving.

Table 3. Underwater Sound Threshold Levels for Disturbance and Injury to Marine Mammals

	Underwater Noise Threshold (dB re: 1µPa)		
Species	Vibratory Pile Driving Disturbance Threshold	Impact Pile Driving Disturbance Threshold	Injury Threshold
Pinnipeds and sea otters	120 dB_{RMS}	160 dB_{RMS}	190 dB_{RMS}
Cetaceans	120 dB_{RMS}	160 dB_{RMS}	180 dB_{RMS}

Notes: dB = decibels; RMS = root-mean-square; µPa = microPascal.
Source: NMFS 2012a.

In order to demonstrate how attenuation measures affect distance to sound thresholds, the NMFS Pile Driving Calculations spreadsheet was used to estimate the potential noise impacts of impact hammer pile driving on fish, as well as the effects of attenuation measures (Table 4) (NMFS 2012b, Halligan pers. comm. 2016). The distance to the onset of injury to fish was calculated, then these results were processed with the data adjusted to account for sound attenuation that would occur through the use of a bubble curtain (-10 decibels [dB]) and through the use of a nylon cushion block placed between the hammer and piling (-5 dB). The model was run assuming that it would take 100 strikes to drive the pilings to tip elevation. These calculations indicate that the use of attenuation measures considerably reduces the distance to thresholds for peak and cumulative sound exposure levels (SELs).

Table 4. Modeled Distance to Threshold for Onset of Injury to Fish from Unattenuated and Attenuated Impact Pile Driving

Piling Type	Attenuated with Bubble Curtain and Cushion Block?	Number of Strikes	Strike Peak (dB) at 10 meters	Strike SEL (dB) at 10 meters	Cumulative Strike SEL (dB) at 10 meters	Distance to Threshold for Onset of Physical Injury (meters)		
						Peak (206 dB)	Cumulative SEL (dB)	
							Fish ≥ 2 g (187 dB)	Fish < 2 g (183 dB)
24-inch pipe	No	100	203	178	198	6	54	100
24-inch pipe	Yes	100	188	163	183	1	5	10
16-inch pipe	No	100	197	172	192	3	22	40
16-inch pipe	Yes	100	182	157	177	0	2	4

Notes: dB = decibels; g = grams; SEL = sound exposure level.

Source: Halligan pers. comm. 2016.

Peak sound pressure levels for vibratory hammers can exceed 180 dB; however, the sound levels generated by vibratory hammers increase relatively slowly. Although peak sound levels can be substantially less than those produced by impact hammers, the total energy imparted can be comparable to impact driving because the vibratory hammer operates continuously, and it often takes longer to install the pile (Buehler et al. 2015). For the project, unattenuated peak and cumulative SELs are not expected to exceed injury threshold levels if a vibratory hammer is used to place the pilings.

Section 5.0 Monitoring and Minimization Measures

5.1 Monitoring and Minimization Measures for Fish

To minimize the potential for injury to fish associated with pile removal and pile driving, the following minimization measures will be implemented:

- In-water pile driving and other underwater noise-generating activities will be limited to the period of July 1 through October 15, when potentially affected sensitive fish species (e.g., salmonids) are least likely to be present in the area.
- Whenever possible, a vibratory hammer will be used to drive piles to prescribed tip elevations.
- When piles are being driven with an impact hammer, a pile cap and cushion and a bubble curtain will be used to minimize underwater noise generated by hammer strikes. The attenuated sound levels will be measured to ensure that sound levels are below peak (206 dB re: 1µPa) and cumulative (187 dB re: 1µPa^2-sec) underwater noise thresholds.
- The use of bubble curtains during pile driving will be limited to periods when current speeds do not prevent their use as an effective attenuation measure; this would be generally around the slack tide although specific timing will depend on the amount of tidal exchange. The hydroacoustic monitor will visually confirm that the bubble curtain is operating effectively during impact pile driving.
- All impact pile driving activities will incorporate a "soft start" approach whereby the piles are lightly tapped before the full hammer strength is applied. The first few taps of the hammer on the pile should cause fish to swim away from the piles before full impact hammer strength is applied, thereby reducing the potential for fish to be exposed to harmful sound levels.
- The removal of 40 creosote piles along the trestle is also proposed as mitigation for potential take of juvenile smelt (addressed in the Incidental Take Permit application to California Department of Fish and Wildlife). Any exceedance of the underwater noise injury threshold will be reported to the California Coastal Commission within 24 hours.

5.2 Monitoring and Minimization Measures for Marine Mammals

To minimize the potential for injury to marine mammals associated with pile driving, the following minimization measures will be implemented:

- Hydroacoustic monitoring will be conducted during Phase 1 pile driving to determine whether underwater noise generated during pile driving reaches injury threshold levels.

- If threshold noise levels are recorded during pile driving, a shutdown zone equal to the distance at which injury threshold sound levels were recorded will be established around each pile being driven.
- If threshold noise levels are recorded during pile driving, a qualified biological monitor will monitor all pile-driving activities by visually searching for marine mammals in the shutdown zone and surrounding waters.
- A qualified biological monitor will visually scan the project site and surrounding waters for the presence of marine mammals at least 30 minutes before and continuously throughout periods of impact pile driving. If any marine mammal is sighted in the shutdown zone before pile driving begins, the contractor (or other authorized individual) will delay pile-driving activities until the animal has moved outside the shutdown zone or the animal is not resighted within 15 minutes for pinnipeds or 30 minutes for cetaceans.
- If any marine mammal is about to enter or is observed in the shutdown zone during pile driving, the pile-driving activities will be shut down until the animal has moved outside the shutdown zone, or the animal is not resighted within 15 minutes for pinnipeds or 30 minutes for cetaceans.

5.3 Hydroacoustic Monitoring

Hydroacoustic monitoring is not required for vibratory pile driving and removal. Hydro acoustic monitoring will only be conducted if and when an impact hammer is being used. Results of hydroacoustic monitoring of impact pile driving will be provided to the California Coastal Commission for their review of the results; they will recommend if hydroacoustic monitoring be either continued or discontinued. For example, if measured sound levels are substantially lower than predicted, the recommendation will be made that the project proceed without further hydroacoustic monitoring. However, if measured sound levels approach thresholds identified in Tables 2 and 3, then the recommendation will be made to continue hydroacoustic monitoring to ensure that thresholds are not met. If the California Coastal Commission recommends that hydroacoustic monitoring continue, contractors will report the results for each pile until the California Coastal Commission determines that hydroacoustic monitoring is no longer required.

A qualified hydroacoustic technician will document sound levels during hydroacoustic monitoring. Sound level measurements will be taken with calibrated, industry standard sound level meters (e.g., Larson-Davis 831 data logging sound level meter) and hydrophones (e.g., Reson TC4013 hydrophones). Two hydrophones will be used during Phase 1 hydroacoustic monitoring. One hydrophone will be placed in the middle of the water column, 10 meters from each pile being driven during sound testing. The second hydrophone will be placed in the middle of the water column and repositioned during pile driving to establish the maximum horizontal distance from the pile at which threshold sound levels are reached. A weighted tape measure will be used to determine the depth of the water before the hydrophones are positioned. Use of the hydroacoustic monitor will ensure that the acoustic path (line of sight) between the pile and the hydrophone(s) is unobstructed during sound data collection.

Appropriate measures will be taken to ensure that flow-induced noise will not interfere with the recording and analysis of the relevant sounds (NMFS 2012c). As a general rule, current speeds of 1.5 meters per second (2.9 knots) or greater generate significant flow-induced noise, which may interfere with the detection and analysis of low-level sounds, such as the sounds from a distant pile driver or background sounds. If it becomes necessary to reduce the flow-induced noise at the hydrophone, a flow shield will be installed around the hydrophone to provide a barrier between the irregular, turbulent flow and the hydrophone. A flow shield will be used when the tidal flow is expected to approach 1.5 meters per second. If no flow shield is used, the current velocity will be measured, and a correlation between the levels of the relevant sounds (background or pile driving) and current speed will be made to determine whether the data are valid and can be included in the analysis.

The contractor will coordinate with the acoustic technician to ensure that the monitoring equipment is in place and operational before pile driving begins. Underwater sound levels will be monitored continuously for the duration of each pile driving event. Pile driving will be measured with a standard (e.g., minimum one-third octave) band frequency resolution. Peak and root-mean-square pressures will be reported in decibels (re: 1 μPa). The cumulative SEL will be reported in decibels (re: 1 μPa^2-sec).

Section 6.0 Reporting

6.1 Phase 1 Reporting

A report describing hydroacoustic monitoring results of the Phase 1 pile driving will be submitted to the California Coastal Commission. The report will summarize the results of the hydroacoustic monitoring and the statistics of the impact sound values for each pile.

6.2 Project (Phase 1 and Phase 2) Reporting

A draft report including data collected and summarized from all Phase 1 and Phase 2 monitoring locations and times will be submitted to the California Coastal Commission within 90 days after the project is completed. The results will be summarized in graphical form and will include summary statistics and time histories of impact sound values for each pile. The report will:

- summarize the results of hydroacoustic monitoring;
- identify pile-driving episodes during which thresholds (Tables 2 and 3) were met or exceeded;
- summarize the statistics of impact sound values for each pile;
- identify the total number of strikes from impact hammers, or the duration of vibratory hammering, required to drive each pile;
- identify the total number of strikes from impact hammers or the cumulative duration of vibratory hammering, during each 24-hour period when pile driving occurs;
- identify the number and size of piles removed and installed each day;
- identify the distance between the hydrophones and the piles being driven;
- identify the depth of the hydrophones and the depth of the water at the hydrophone locations;
- identify the horizontal distance from piles at which thresholds (Tables 2 and 3) were met or exceeded;
- identify the depth of water in which the piles were driven;
- identify the depth into the substrate that the piles were driven;
- describe any observable reaction by fish or marine mammals to pile driving;
- identify the number and species of marine mammals observed during marine mammal monitoring; and

A final report will be submitted to the California Coastal Commission within 30 days following receipt of the agency's comments on the draft report.

Section 7.0 References

Barker, Miles. Affiliate. National Marine Fisheries Service, Arcata, California. March 24, 2016—email correspondence to Neil Kalson.

Buehler, D., R. Oestman, J. Reyff, K. Pommerenck, and B. Mitchell. 2015. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Prepared for California Department of Transportation, Sacramento, California.

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[NMFS] National Marine Fisheries Service. 2012a. Guidance Document: Sound Propagation Modeling to Characterize Pile Driving Sounds Relevant to Marine Mammals [memorandum]. January 31. Northwest Fisheries Science Center, Conservation Biology Division, and Northwest Regional Office, Protected Resources Division.

[NMFS] National Marine Fisheries Service. 2012b. NMFS Pile Driving Calculations [Excel spreadsheet]. Posted on California Department of Transportation website on October 2, 2012. <http://www.dot.ca.gov/hq/env/bio/fisheries_bioacoustics.htm>.

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Stadler pers. comm. Cited in Buehler, D., R. Oestman, J. Reyff, K. Pommerenck, and B. Mitchell. 2015. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Prepared for California Department of Transportation, Sacramento, California.

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Chevron Eureka Terminal Seismic Retrofit Project: Eelgrass Mitigation and Monitoring Plan

Draft

Project # 3606-05

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H. T. Harvey & Associates

EXHIBIT NO. 7
APPLICATION 1-16-0049 CHEVRON **EXCERPTS FROM EELGRASS MITIGATION & MONITORING PLAN – 1 of 18**

April 28, 2016

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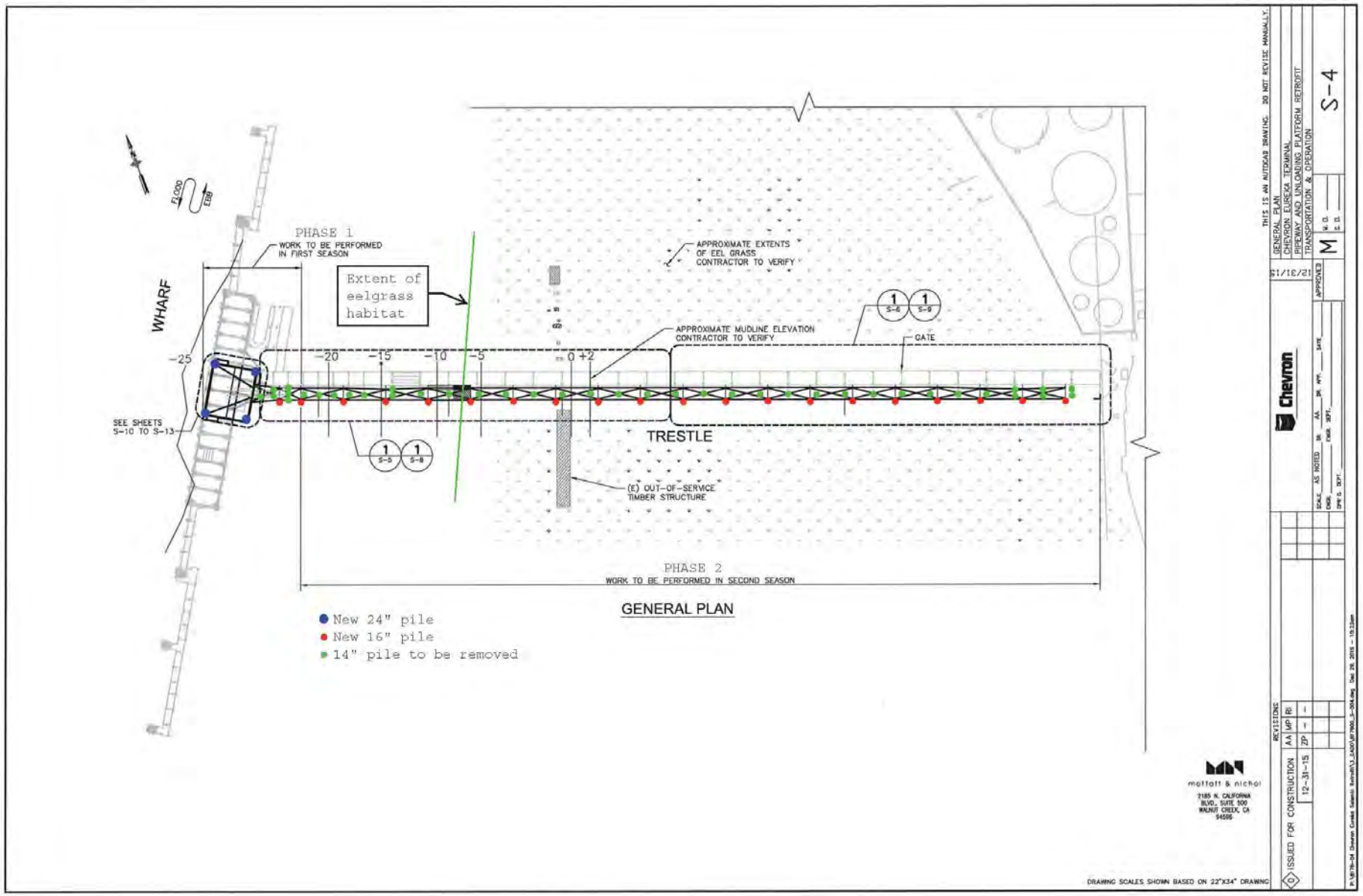

Figure 2. General Plan for Phase 1 and Phase 2 Pile Installation

1.3 Environmental Setting

In Humboldt Bay, eelgrass is found in extensive meadows in the basins of the North and South Bays. The upper and lower limits of eelgrass distribution vary from site to site, with a maximum elevation range during the growing season of -2.1 meter to 1.4 meter mean lower low water (Gilkerson 2008). Eelgrass beds in Humboldt Bay are persistent all year, but they exhibit high variability in distribution and density, both seasonally and from year to year. The fluctuations may be related to seasonal rainfall patterns, currents, frequency of turbidity events, freshwater flows, grazing by black brant (*Branta bernicla nigricans*), and changes in nutrient levels. The eelgrass beds near the mouth of Elk River have been noted as being especially dynamic (Schlosser and Eicher 2012).

Eelgrass beds are found bordering the North Bay Channel, where the Chevron Eureka Terminal is located, approximately 365.8 meters north of the mouth of Elk River. The approximate distribution of dense and patchy eelgrass in the vicinity of the project site is shown in Figure 3, based on field mapping we conducted at the site in 2015. We compared the NOAA (June 27, 2009) imagery, in true color and color infrared, with Google Earth imagery from 2003 through 2012, which is available for each growing season except 2007–2008, with the timing of the imagery ranging from May through August (NOAA 2009). Variability in eelgrass distribution at this location is evident from a review of the photographs, although low-imagery resolution and high-tide coverage at the time when the photographs were taken in some years limit the amount of information that can be derived. In general, eelgrass around the project site appears to have a narrower distribution close to the channel early in the growing season (May–June); in some years, eelgrass expands its distribution shoreward later in the growing season (July–August). The deep water channel margin of the eelgrass bed appears to remain fairly constant. This pattern is consistent with field observations of the area.

In 2015, eelgrass was observed growing on mudflats on the project site on the north and south sides of the trestle. Dense eelgrass bordered the North Bay Channel (see Photo 1 in Appendix B). Additionally, moderate to patchy eelgrass cover extended to a higher mudflat elevation, with eelgrass density decreasing at higher elevations, and with scattered individual plants occurring within 10 meters of the riprap shoreline (see Photos 2 and 3 in Appendix B). Dense macroalgae, primarily sheet *Ulva* sp., was observed growing with eelgrass in midelevations to high elevations of the mudflat (see Photos 4 and 5 in Appendix B). Eelgrass was observed growing immediately adjacent to piles on the south side of the trestle at suitable elevations, but little eelgrass was present close to piles on the north side of the trestle because of the shade provided by the trestle.

N:\Projects3600\3606-01\05\Reports\Figure 3 Eelgrass beds in the vicinity of the project site HTH 2014.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 3: Eelgrass Beds in the Vicinity of the Project Site (H. T. Harvey and Associates 2014)

Chevron Eureka Terminal Seismic Retrofit Project: Eelgrass Mitigation and Monitoring Plan (3606-05)

April 2016

Section 2.0 Impacts

2.1 Permanent Impacts Requiring Compensatory Mitigation

Permanent impacts result from actions that alter the substrate in such a way that it is no longer suitable to support eelgrass. Even if eelgrass is not present at the time the action occurs, this still represents an impact if the action occurs in an area known to support eelgrass. The installation of 15 new steel piles in eelgrass habitat represents a permanent impact that will require compensatory mitigation. Cumulatively, this will displace eelgrass over a 1.9-square-meter area.

2.2 Impacts Requiring Avoidance and Minimization

The following types of impacts could result from implementing the proposed project:

- Substrate disturbance/direct uprooting or crushing of eelgrass turions, which could be caused by:
  - Pile installation (i.e., disturbance in excess of the area where eelgrass is permanently displaced)
  - Pile removal
  - Barge anchoring
  - Propeller action
  - Barge grounding
- Water quality effects, such as:
  - Chemical leaching from new piles
  - Chemical spills (e.g., of fuel or hydraulic fluid)
- Turbidity
- Shading

The project's potential effects on water circulation patterns and nutrient loading also were considered, but it was determined that such impacts would not occur because implementing the project would not change circulation or nutrient loads.

Most of the potential impacts listed above will be avoided through implementation of the project's avoidance and minimization measures (listed in Section 4.0). However, project actions that could cause disturbance of the substrate (pile installation, pile removal, barge anchoring, propeller action, and barge grounding) might result in longer-term impacts on eelgrass and could potentially require additional mitigation. These impacts and their mechanisms are discussed in further detail below.

2.3 Impacts Potentially Requiring Additional Mitigation

Temporary or permanent impacts could result from project actions that uproot, crush, or dislodge eelgrass turions. If the substrate is in suitable condition following the action, eelgrass may revegetate the area naturally; however, if recovery is not achieved by the growing season following construction, the impact constitutes a temporal loss of eelgrass.

In areas that currently support eelgrass, temporary substrate disturbance is not expected to alter the substrate in a way that would create conditions permanently unsuitable for eelgrass growth. In cases where temporary substrate disturbance is unavoidable and results in direct impacts on eelgrass turions, it is expected that the eelgrass will be able to revegetate by natural means; however, it is difficult to predict how rapidly this might occur because growth patterns are naturally variable. Eelgrass can revegetate the disturbed areas either by vegetative expansion through rhizome expansion or by seedling recruitment the following spring. At the project site, rhizome expansion is most likely to occur in the dense eelgrass, whereas recolonization of disturbed areas by seedling recruitment is likely to be more important in the higher intertidal zone where eelgrass is patchy. The potential areas of disturbance associated with project actions are relatively small, and there are abundant eelgrass propagules available at the site. The success of seedling recruitment is unpredictable for any one year. In permanent study plots in Entrance Bay monitored from 2001 through 2008, eelgrass seedling density varied widely from year to year (Schlosser and Eicher 2012).

Areas less than several meters wide have been noted to recolonize by rhizome extension much more rapidly than larger areas (Fonesca et al. 1998). Boese (2002) simulated clam digging activities within 1-square-meter study plots in Yaquina Bay, Oregon, by excavating 0.25 square meter in one section of the plot and depositing the material in another section of the same plot. He found no significant difference in eelgrass cover or biomass in study plots compared to control plots 10 months following treatment. In other scientific investigations involving destructive sampling in eelgrass beds, study plots less than 1 square meter have been observed to recover from the disturbance by the following growing season (Rumrill pers. comm. 2014).

2.3.1 Pile Installation Impacts

In addition to the permanent impact of eelgrass displacement caused by pile installation (see Section 2.1), the installation process could cause substrate disturbance, resulting in additional impacts, although this type of impact is not expected.

2.3.2 Pile Removal Impacts

Twenty-five timber piles will be removed from eelgrass habitat. Eelgrass does not grow close to some piles, especially those at higher elevations. Where eelgrass is growing immediately adjacent to piles, some plants may be uprooted or crushed during the process of pile removal. In these cases, it is expected that eelgrass will reestablish, but it is unknown if or how quickly this will occur.

2.3.3 Barge Anchoring Impacts

Although some project locations near the east end of the trestle may be accessed from the shore, most Phase 2 project activities will require the use of a barge. During an incoming tide, when the water is sufficiently deep to prevent contact with the substrate, the push boat operator will push the barge into position over the eelgrass. The barge will be positioned adjacent to the trestle and will be temporarily anchored at each work location by setting one to two spud poles at the stern of the barge. The spuds are pointed steel pipes 0.71 meter in diameter that penetrate the bay mud up to 3 meters. Spud poles are set in place using gravity and retrieved using a powered pulley system. The spud poles will be set between 3.0 and 42.7 meters south of the trestle. The maximum time that the barge will be positioned at any one location is less than one tidal cycle. When leaving the work site, the barge must return to the North Bay Channel before the water depth becomes too shallow. Within these localized areas where temporary substrate disturbance will be caused by spud pole sets, eelgrass is expected to reestablish. During a postconstruction inspection in 2015 surveyors were unable to identify the locations of spud pole sets, suggesting that their impact on eelgrass may be minimal or non-existent. However, this should be considered preliminary until postconstruction surveys are conducted in July 2016. It is unknown if or how quickly reestablishment will occur.

2.3.4 Propeller Action Impacts

A tugboat and skiff will be used to position the barge over the eelgrass bed. In shallow depths, the propellers of both the tugboat and the skiff have the potential to create turbulent conditions (prop-wash) that can disturb or damage eelgrass beds.

2.3.5 Barge Grounding Impacts

Grounding of the barge is not expected but could occur. Preconstruction and postconstruction monitoring will provide data on eelgrass variables in the project survey area. These data, compared to data for the reference survey area, will allow for assessment of the level of any impacts and setting of target goals for on-site recovery and off-site mitigation as needed. If the barge is grounded, permitting agencies will be notified immediately. Areas affected will be photodocumented, and the most direct method possible will be used to calculate the area damaged (i.e., the area of substrate disturbed will be measured as soon as possible following the incident). This area will be inspected again during the one-year postconstruction monitoring survey to determine if permanent impacts occurred and the amount of compensatory mitigation required.

Section 3.0 Monitoring

Monitoring of the project site and a nearby reference site will be conducted to determine whether project actions result in impacts requiring compensatory mitigation. Monitoring will include (1) preconstruction and postconstruction eelgrass mapping and surveys, conducted during the active eelgrass growing season; (2) construction monitoring, conducted whenever construction may affect eelgrass habitat; and (3) a postconstruction inspection, conducted soon after construction.

3.1 Survey Areas

3.1.1 Project Site

At the project site, surveys will be conducted in areas where proposed project actions may reasonably be expected to result in direct or indirect impacts on eelgrass. Specifically, these are the areas adjacent to the trestle where piles are proposed for placement and removal and the area south of the trestle where spud poles will be set. All survey areas will extend from the lowest to the highest extent of eelgrass occurrence. The south trestle survey area will be 10 meters wide, and the spud pole survey area will be 35 meters wide to cover the entire area that the barge will be operating in (Table 1, Figure 4).

Table 1. Survey Area Boundaries at Project and Reference Sites

	Boundaries	
Survey Area	**North to South**	**West to East**
Project site		
South trestle	From trestle midline to 10 meters south	From lowest to highest extent of eelgrass
Spud pole	From 10–45 meters south of trestle	From lowest to highest extent of eelgrass
Reference site		
	75–85 meters south of trestle	From lowest to highest extent of eelgrass

3.1.2 Reference Site

In addition to project site survey areas, a reference site will be surveyed to help determine whether observed changes are attributable to natural variability or whether they are a response to project actions. Natural spatial and temporal variability in eelgrass is high, and this variability can confound the evaluation of eelgrass response to project actions, necessitating comparison of observed changes between project and reference sites. The reference site will be located 75–85 meters south of the trestle and will extend from the lowest to the highest extent of eelgrass occurrence (Figure 4). This reference site is part of the same eelgrass bed at the project site, but it is located far enough away to be unaffected by the project. The area identified as the reference site has environmental conditions and eelgrass characteristics similar to those present on the project site.

N:\Projects3600\3606-01\05\Reports\Figure 4 Eelgrass Survey Area Boundaries.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 4: Eelgrass Survey Area Boundaries
Chevron Eureka Terminal Seismic Retrofit Project:
Eelgrass Mitigation and Monitoring Plan (3606-05)
April 2016

3.2 Eelgrass Mapping

In the survey areas defined above, vegetated eelgrass cover will be delineated by using a Global Positioning System unit with submeter accuracy. Vegetated eelgrass cover is defined as eelgrass plants occurring within 1 meter of other eelgrass plants (NMFS 2014). Using geospatial software, we will identify a 5-meter-area around all vegetated eelgrass cover to define the full extent of eelgrass habitat, in accordance with NMFS (2014). A map identifying the locations of eelgrass will be prepared for the project site and reference site survey areas. It will clearly show all vegetated eelgrass cover within the larger boundaries of eelgrass habitat. The map will show bathymetric contours at a 0.3-meter contour interval adjusted to a local mean lower low water datum using available data (NOAA 2013, NHE 2014, NOAA 2014).

3.3 Survey Variables

During each of the preconstruction and postconstruction growing season surveys, we will measure four variables that have been identified for use in eelgrass habitat surveys and assessment of effects of an action on eelgrass (NMFS 2014): (1) spatial distribution, (2) areal extent, (3) percent vegetated cover, and (4) turion (shoot) density.

Fieldwork will be conducted at tides low enough to sufficiently expose the eelgrass beds for traversing by foot. Spatial distribution and areal extent will be based on field mapping and geospatial analysis. Percent cover and turion density will be based on quantitative plot-based field sampling within vegetated eelgrass cover. Sample plots will be spatially stratified, and plot location will be determined by randomly generating points using geospatial software. Strata will be defined both by survey area (Table 1, Figure 4) and by two to three eelgrass density classes along the elevation gradient.

A minimum of 30 plots in each eelgrass density class in the south trestle and reference survey areas and 60 plots in each eelgrass density class in the spud pole survey area will be surveyed. The number of plots surveyed and sample plot size may vary among eelgrass density classes, with plot size ranging from 0.0625 to 1 square meter. SeaGrass Net sampling protocol uses 0.25-square-meter quadrats to estimate seagrass cover, and 0.0625-square-meter quadrats to measure turion density (Short et al. 2006). The Humboldt Bay Cooperative Eelgrass Project (UCSGE 2001, 2002, 2003) found no statistically significant difference between using 0.1, 0.5, and 1 square meter to measure eelgrass turion density, shoot length, or biomass in across-gradient sampling of eelgrass beds in Humboldt Bay. The use of fewer, smaller plots in dense, relatively homogenous eelgrass zones and more, larger plots in sparse/patchy zones is a sound and efficient method for addressing differences in spatial variability between density classes (Thompson 2002, Shaughnessy pers. comm. 2014). This sampling strategy also allows for a higher number of replicate measurements to be taken in the regions having the most inherent natural variability. High temporal and spatial variation in eelgrass density can dramatically increase the sample size necessary to reliably detect changes in eelgrass density (Krueger et al. 2007).

In addition to natural variation at the site, recreational clamming activities cause substrate disturbances that could confound assessment of changes in eelgrass density in relation to project actions. Recreational clamming activity has been observed during very low tides at the project site (see Photos 6 and 7 in Appendix B).

3.3.1 Spatial Distribution

The spatial distribution of eelgrass habitat, as depicted in the eelgrass maps, will extend 5 meters around all vegetated eelgrass cover and therefore can include interior unvegetated gaps in cover of up to 10 meters. The boundary delineating eelgrass habitat will not extend into areas where depth or substrate are unsuitable to support eelgrass or where eelgrass establishment is precluded by the presence of existing structures (NMFS 2014).

3.3.2 Areal Extent

Areal extent will be calculated for eelgrass habitat as defined above and will be broken down to show the extent of both vegetated eelgrass cover and unvegetated gaps. Areal extent will be determined using commercially available geospatial analysis software and will be reported in square meters.

3.3.3 Percent Vegetated Cover

Percent vegetated cover is defined by NMFS (2014) as the amount of vegetated cover relative to the total extent of eelgrass habitat. This calculation will be used to help stratify the survey areas into two to three density classes along the elevation gradient. Vertical zonation is apparent at the project site and reference site, with dense eelgrass at the channel edge transitioning to sparse and very sparse zones higher in the intertidal region. To better enable detection of potentially small, localized impacts, a secondary measure of percent cover will be made in accordance with California Department of Fish and Wildlife recommendations (Garwood pers. comm. 2014) based on quantitative plot-based field sampling in vegetated eelgrass cover. Sample plots will be spatially stratified by survey area and density class, and plot location will be determined by randomly generating points using geospatial software, as described above. Within each sample plot, percent cover will be visually estimated to the nearest 5%. Percent cover will be reported as a mean ± the standard deviation of replicate measurements. Vegetated eelgrass cover can include small, unvegetated gaps of less than 1 square meter (NMFS 2014); therefore, values of 0% cover are possible and will be included in the estimation of mean percent cover to better enable the detection of small, localized impacts.

3.3.4 Turion Density

Turion density will be measured using the same plots used for assessing percent cover. The number of eelgrass turions in each sample plot will be counted. Turion density will be reported as a mean ± the standard deviation of replicate measurements. Vegetated eelgrass cover can include small, unvegetated gaps of less than 1 square meter (NMFS 2014); therefore, values of 0% turion density are possible and will be included in the estimation of mean turion density to better enable the detection of small, localized impacts.

3.4 Photodocumentation

Photographs will be used to document site conditions. The photographs will be georeferenced so that they can be taken in the same locations before and after construction. They will be taken at each location where substrate disturbance is likely to occur or has occurred, including the locations of pile installation and removals and spud pole sets. Photographs also will be taken to represent different survey areas and eelgrass density classes.

Preconstruction and postconstruction photographs will be taken during field assessments. During construction, photographs will be taken at the locations where spud pole sets occur and where piles are placed and removed. Following construction, photographs will be taken as soon as possible to document the location and extent of substrate disturbance associated with construction activities.

3.5 Monitoring Schedule

3.5.1 Eelgrass Mapping and Surveys

The preconstruction eelgrass mapping and surveys will be conducted in May or June 2017, during the active growth period for eelgrass and within 60 days before construction begins. The postconstruction survey will be conducted in May or June 2018, at a time similar to when the preconstruction survey was conducted and near the beginning of the active growth period for eelgrass. This timing is consistent with NMFS (2014) guidelines, which have identified the period of May through September as the active eelgrass growing season in northern California.

3.5.2 Construction Monitoring

A biological monitor will be present on site while work is being performed in areas where eelgrass habitat may be affected. The monitor will be present only when work is being conducted in eelgrass habitat, which may vary from year to year within the July 1–October 15 work window. The biological monitor will document all locations where spud poles are set; where piles are installed and removed; and where any unexpected actions, such as propeller scarring, negatively affect eelgrass.

3.5.3 Postconstruction Inspections

In addition to the growing season surveys, the project site will be inspected as soon as feasible (depending on tides and other factors) following construction in 2017. The main purpose of the postconstruction inspection will be to help document the extent of substrate disturbance caused by pile installation, pile removal, and spud pole sets because these disturbances may be difficult to see by the following growing season. Georeferenced photodocumentation will be used to compare visible areas of disturbance with preconstruction and postconstruction conditions. No other data will be collected during the postconstruction inspections because construction will be completed during a time of year when eelgrass is not actively growing.

Section 4.0 Mitigation

4.1 Avoidance and Minimization Measures

Avoidance and minimization measures for potential project impacts are summarized in Table 2. These measures, which will be incorporated into the project, are anticipated to be effective in reducing most impacts to a less-than-significant level.

Table 2. Potential Impacts and Proposed Avoidance and Minimization Measures

Potential Impact and Mechanism	Avoidance and Minimization Measure
Substrate disturbance/uprooting or crushing of eelgrass	
Pile installation and pile removal	Old piles will be placed in a containment area on the barge and not allowed to rest on the substrate surface. A biological monitor will be present on site while construction is being performed in eelgrass habitat to observe pile installation and pile removal operations and to ensure that the item above is completed.
Barge anchoring	Only two 0.71-meter-diameter spud poles will be used to anchor the barge; no chains or other materials will be dragged on the substrate surface. If possible, spud poles will be placed in areas of mudflat devoid of eelgrass. The maximum duration of spud pole penetration at each work location will be less than one tidal cycle. A biological monitor will be present on site while work is being performed in eelgrass habitat to document the number and location of spud pole placements.
Barge or propeller scarring	Work in eelgrass habitat will be conducted during tides high enough to float the barge and prevent contact with the substrate. Depth-sounding equipment will be used to help alert the barge operator as tide levels recede. A biological monitor will be present on site while work is being performed in eelgrass habitat to document the timing and location of substrate disturbance if accidental barge grounding or propeller scarring occurs.

Potential Impact and Mechanism	Avoidance and Minimization Measure
Water quality degradation	
Chemical leaching from new piles	The new piles are made of steel and will be precoated and cured with DFT Amercoat 240 Epoxy that extends from the top of the pile to 3.0 meters below the mudline. Chemical leaching from new piles is not expected to occur.
Chemical spills (fuel, hydraulic fluid)	Spill prevention, control, and countermeasure plans will be developed and implemented. Only biodiesel and vegetable-based hydraulic oil will be used in equipment that will be used over the water. Spill kits with contents appropriate for the types of hazardous materials present will be maintained on the barge and the dock. Booms will be available to contain any materials spilled in the water.
Turbidity	Work in eelgrass habitat will be conducted as quickly as possible. Turbidity-generating activities will be limited to small, localized areas associated with pile installation, pile removal, and spud pole placement.
Shading	The maximum continuous period during which the barge will be located at a single work site will be less than one tidal cycle.

No impacts related to shaded are expected to occur for three reasons: (1) the trestle pipeway will extend further to the south only slightly more than the diameter of one steel pile (0.41 meters), (2) more wood piles will be removed than steel piles will be installed, and (3) within eelgrass habitat, 22 existing bents will be replaced by 15 new bents. The retrofitted pipeway support system is expected to shade eelgrass less than the existing structure. Also, no changes to water circulation or nutrient loading are expected to result from implementing the proposed project.

4.2 Additional Mitigation Measures

4.2.1 Compensatory Mitigation Assessment

Compensatory mitigation will be needed for the permanent impacts associated with the installation of new piles. The need for additional compensatory mitigation will be determined in 2018 following the postconstruction field assessment. Mitigation assessments will be based on a combination of direct evidence of visible scarring and an analysis of the survey variables measured during the growing season. If visible scarring is evident as a result of project actions, then the extent of this area will be measured directly in the field and considered in determining the area needed for mitigation. For the purposes of this plan, an area with a visible scar has all the following elements:

- It is located where a project action is known to have occurred during the previous growing season.
- There is evidence that eelgrass was present at the location during the previous growing season.
- It is devoid of eelgrass cover.

Preconstruction and postconstruction photographs will be used to help detect and document the presence of scarring. Because the piles are located or will be located at fixed locations, the preconstruction and postconstruction photographs can be taken at the same georeferenced location. In addition, because the precise locations of spud pole placement cannot be determined before construction, georeferenced preconstruction photographs will be taken of the general area where spud pole sets are expected. These photographs will help document whether any eelgrass was present in the general area during the previous growing season and, if so, whether it was dense, sparse, or patchy. The photographs can then be compared with photographs taken soon after construction and the following growing season at the locations where spud poles are placed to help detect scarring.

The survey variables measured during the growing season will be analyzed to detect changes between preconstruction and postconstruction conditions in eelgrass areal extent, percent cover, and turion density. The results will be compared between project site and reference site survey areas to assess whether the changes are a result of natural variability or whether they can be attributed to project actions. Declines in eelgrass that can be attributed to project actions will require compensatory mitigation.

Impacts will be quantified as follows:

- **Decrease in vegetated eelgrass cover.** If a decrease in areal extent is detected through calculations based on mapping, the amount of decreased area will require compensatory mitigation. If the direct measurement of visible scarring is higher than the area detected by mapping, then the higher value will be used as a basis for mitigation.
- **Declines in eelgrass cover or density.** Within vegetated areas, if a decrease (defined as greater than 25% reduction) in either mean percent cover or mean turion density is detected relative to the reference site, the decline will require compensatory mitigation. The 25% density reduction threshold was suggested by NMFS (2014) as reasonable based on supporting information (Fonseca et al. 1998, WDFW 2008). If a decline in both percent cover and turion density can be detected, then the higher value will be used as a basis for mitigation. The magnitude of the impact will be equivalent to the proportion of the decrease. For example, a 25% reduction in eelgrass cover within a 10-square-meter area would require 2.5 square meters of mitigation.

4.2.2 Compensatory Mitigation Measures

The fifteen 0.41-meter-diameter steel piles proposed for installation along the south edge of the trestle will require compensatory mitigation because of the permanent loss of eelgrass habitat. Chevron will mitigate permanent losses to eelgrass habitat through the removal of 25 0.36-meter-diameter timber piles that are part of the timber pipeway support system. The project is expected to be self-mitigating. The removal of 25 timber piles that are part of the existing trestle will open up 2.5 square meters of mudflat suitable for eelgrass colonization. At a 1:1 ratio, this is more than enough to compensate for the 1.9 square meters of permanent impacts on eelgrass habitat resulting from the installation of 15 new steel piles. An additional 15 timber piles will be removed that are located in deep water, totaling 1.5 square meters, which could be used as a mitigation credit at a 2:1 ratio. In sum, a total of 1.35 square meters of mitigation credit (0.6 square meter of credit from timber removal in shallow-water habitat at 1:1 ratio plus 0.75 meter of credit from timber removal of 1.5 square meters in deep-water habitat at 2:1 ratio) will be available to compensate for any losses associated with project activities in addition to the known permanent impacts. If unanticipated impacts occur in excess of this amount, then additional mitigation opportunities will be explored.

Section 5.0 References

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EXHIBIT NO. 8

APPLICATION 1-16-0049
CHEVRON
LONGFIN SMELT MITIGATION SITE