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Staff:	C. Kenyon-A
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STAFF REPORT: REGULAR CALENDAR

Application No.:	**1-16-0357**
Applicant:	**City of Eureka**
Location:	Along the shoreline of Humboldt Bay from the Truesdale-Vista Point parking lot south approximately 885 feet toward Hilfiker Lane, Eureka, Humboldt County (APNs 007-081-16, 007-091-02, 007-091-03, 007-091-07, 007-091-05, 007-091-06).
Project Description:	Authorization for the repair and expansion of shoreline revetment conducted in January 2016 partly under Emergency Permit G-1-16-0003 and comprising the placement of approximately 2,000 tons of rock slope protection materials along a 15-foot-wide by 885-foot-long stretch of Humboldt Bay shoreline.
Staff Recommendation:	Approval with conditions.

SUMMARY OF STAFF RECOMMENDATION

During the winter of 2015-2016, extreme high tides coupled with storm activity eroded an unfortified segment of Humboldt Bay shoreline landward up to 25 feet in places, threatening to

expose a buried pressure sewer main that parallels the shoreline. In response, the City constructed a 600-foot-long rock revetment and backfilled behind the revetment to reestablish the location of the shoreline that existed prior to winter erosion. The City also repaired parts of an adjoining existing revetment. The entire project resulted in the placement of approximately 2,000 tons of additional rock along 885 feet of the Humboldt Bay shoreline.

The revetment construction was conducted in part under an emergency permit issued on January 8, 2016, which temporarily authorized the installation of rock slope protection along a 10-foot-wide by 300-foot-long segment of shoreline. The City is seeking permanent authorization for this work temporarily authorized by the emergency permit as well as after-the-fact authorization for (a) the five additional feet of width and 300 additional feet of length of new revetment installed and (b) the repairs to the adjoining revetment.

Because the sewer main that the revetment was installed to protect was not constructed prior to the passage of the Coastal Act, it is not eligible for consideration of shoreline protection pursuant to Coastal Act 30235. However, staff believes a limited term authorization of the revetment would be consistent with the Chapter 3 policies of the Coastal Act, and therefore is recommending approval with conditions limiting the authorization period.

Regarding Section 30253, the engineering geology reports prepared for the project indicate that the revetment will assure stability and structural integrity at the time of construction. However, the engineering geology reports indicate the revetment design did not take into account sea level rise and did not analyze how the revetment is sited and engineered for the changing water levels, increased wave energy, and other associated impacts that might occur over the life of the development.

Regarding Section 30233, the new segment of revetment was constructed to prevent exposure of a sewer main to tidal waters and therefore qualifies as an "incidental public service," one of the allowable uses of wetland fill for as long as the revetment is needed to protect the sewer main. Section 30233 also requires that wetland fill shall only be permitted when there is no feasible less environmentally damaging alternative and where feasible mitigation measures have been provided to minimize adverse environmental effects. The City has submitted an alternatives analysis for wetland fill that only considered the feasibility of less environmentally damaging alternatives at the time of the emergency work, and no mitigation has been proposed for the loss of intertidal habitat over the life of the revetment nor has there been any attempt to analyze the extent or timing of future impacts.

To ensure consistency with Coastal Act §§30233 and 30253, Commission staff recommends **Special Condition 4** limiting the authorization period of the new 600-foot-long revetment until the earlier of July 1, 2026, or until the time when the currently existing sewer main warranting armoring (1) is redeveloped, (2) is no longer present and/or (3) no longer requires armoring for such protection, whichever occurs first. Removal or relocation of the revetment will only become feasible when the subject sewer main is removed or relocated. The City is currently working with the Regional Board through the current NPDES permit for the City's wastewater system and a cease and desist order to explore design alternatives to various aspects of the wastewater collection and treatment system, including the subject sewer main, taking into account projected

sea level rise. The City is required to complete the analysis and secure all required environmental permits for the selected alternative by 2026. The City has requested that if permanent authorization of the revetment cannot be found consistent with the Coastal Act, that the subject coastal development permit be valid until at least 2026 to coincide with the broader planning efforts currently underway.

As recommended by Commission staff, Special Condition 4 requires that prior to the end of the permit authorization period, the permittee submit an application for an amendment to this CDP to remove the revetment or extend its authorization with any necessary design modifications to ensure consistency with the Coastal Act. The application must include: (1) an evaluation of alternatives to the shoreline revetment that can eliminate and/or reduce impacts to public access, public views, shoreline processes, marine resources, aquatic intertidal habitat, and other coastal resources at the site while minimizing risks of geologic and flood hazards and assuring structural stability; and (2) proposed mitigation for unavoidable coastal resource impacts associated with each of the alternatives including retention of the new portion of the revetment beyond the initial authorization period.

Given the negative impacts of hard armoring on the California coast and the outstanding information regarding the future stability of the structure and the future feasibility of known less environmentally damaging alternatives at this site, limiting the authorization term and requiring a comprehensive alternatives analysis at the time the City is evaluating upgrades and reconfiguration of the City's entire wastewater treatment system consistent with the terms of their Regional Board cease and desist order is feasible and assures consistency with Coastal Act §§30233 and 30253.

If not properly maintained, the revetment will degrade overtime, as the revetment settles and rocks dislodged by coastal erosion migrate out onto the tidal flat. To protect public access and visual resources, assure continued structural stability without contributing to erosion, and minimize wetland fill impacts, Commission staff recommends **Special Conditions 2 and 3** requiring monitoring and maintenance of the new and repaired portions of revetment. These conditions require removal of any debris, rock, or material that becomes dislodged from the new and repaired revetment and prohibits bayward encroachment of the new and repaired revetment.

Staff believes that the proposed development, 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) 1-16-0357 with special conditions is found on page 5.

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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 1-16-0357 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. **Interpretation**: Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.

3. **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.

4. **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. **Permit Issuance and Condition Compliance.** Because some of the proposed development has already commenced, this coastal development permit shall be deemed issued upon the Commission's approval. Failure to comply with the special conditions of this permit may result in the institution of an action to enforce those conditions under the provisions of Chapter 9 of the Coastal Act.

2. **Monitoring of New and Repaired Revetment.**
   A. The authorized revetment including the 600 linear feet of new revetment constructed in January 2016 and the preexisting segment of revetment to the north repaired in January 2016 shall be inspected at least once each year and after any tide of 8.78 feet (NAVD88) or higher (the current mean annual maximum water level) that is coupled with significant wind waves.
   B. Inspections shall include documentation of the condition and performance of the authorized revetment, including an assessment of whether: (1) any weathering or damage has occurred that could adversely impact future performance of the revetment; (2) any rock facing, river rock backfill, or any other components of the revetment have migrated onto the tidal flat; (3) any slumping of the revetment, washout of smaller rocks and loose sandy backfill, or undercutting of the adjacent shoreline has occurred; and (4) the profile or footprint of the revetment has been altered from what is described and depicted on the as-built plans (Exhibit 3, pg. 4).
   C. The City shall maintain a monitoring log documenting the results of each inspection including all inspection dates, observations, and proposed maintenance activities. The log shall be available for inspection upon request by the Executive Director of the Coastal Commission.

3. **Ongoing Maintenance of Revetment.** The authorized revetment including the 600 linear feet of new revetment constructed in January 2016 and the preexisting segment of revetment to the north repaired in January 2016 shall be maintained in its authorized as-built state, subject to the following:
   A. **Routine Maintenance Required**. The permittee shall remove or redeposit any debris, rock, or material that becomes dislodged from the new or repaired portions of the revetment and shall take measures to eliminate the exposure of subsurface elements as soon as possible after such displacement or exposure occurs and otherwise prevent the revetment from encroaching bayward of its authorized footprint (Exhibit 3, pg. 4). The permittee shall contact the Coastal Commission’s North Coast District Office immediately to determine whether such activities require a coastal development permit amendment.
   B. **Initial Revetment Maintenance.** WITHIN SIX MONTHS OF THE DATE OF COMMISSION ACTION ON PERMIT 1-16-0357 (UNLESS EXTENDED BY THE EXECUTIVE DIRECTOR FOR GOOD CAUSE), the permittee shall address all existing maintenance needs including:

i. Manually removing rock, pebble, and other debris that has become dislodged from the new and repaired portions of the revetment and has migrated onto the adjacent tidal flat. Removal shall occur during low tide (to avoid work in water);
ii. Addressing geotextile fabric and any other subsurface elements of the new and repaired portions of the revetment that have become exposed;
iii. Addressing washout of smaller rocks and loose sandy backfill and undercutting of the adjacent shoreline; and
iv. Rectifying slumping of repaired portions of the preexisting portion of revetment.

C. **Definition**. "Maintenance," as it is understood in this special condition, means development that would otherwise require a CDP whose purpose is to maintain in the approved state the new and repaired shoreline revetment. Proposed activities that add to, enlarge, extend, heighten, or otherwise expand the authorized shoreline revetment development in any way shall not be considered maintenance and shall require an amendment to this permit or a new CDP depending on the nature and extent of the proposed activities.

D. **Other Agency Approvals**. The permittee acknowledges that these maintenance stipulations do not obviate the need to obtain permits from other agencies for any future maintenance and/or repair episodes.

E. **Maintenance Notification of Coastal Commission**. At least 30 days prior to commencing any maintenance event, the permittee shall notify, in writing, the Coastal Commission's North Coast District Office. The notification shall include: (1) a detailed description of the maintenance event proposed; (2) any plans, engineering and/or geology reports describing the event; (3) any other required agency authorizations; and (4) any other supporting documentation describing the maintenance event. The maintenance event shall not commence until the permittee has been informed by the Coastal Commission's North Coast District Office that the maintenance event complies with this CDP. In the event of an emergency requiring immediate maintenance, the notification of such emergency episode shall be made as soon as possible, and shall (in addition to the aforementioned information) clearly describe the nature of the emergency.

F. **Maintenance Notification of Tribal Historical Preservation Officers (THPOs).** At least 30 days prior to commencing any maintenance event disturbing the upland areas around the revetment, the City shall notify the THPOs from the Wiyot Tribe, the Bear River Band of Rohnerville Rancheria, and the Blue Lake Rancheria and arrange for tribal representative(s) to be present to observe ground-disturbing activities if deemed necessary by the THPOs. A cultural resources monitor approved by the Wiyot Tribe, the Bear River Band of Rohnerville Rancheria, and the Blue Lake Rancheria shall be present to oversee all ground disturbing maintenance activities unless evidence has been submitted for the review and approval of the Executive Director that the THPOs of these three entities have agreed that a cultural resources monitor need not be present.

G. **Restoration**. The permittee shall restore areas impacted by construction activities to their pre-construction condition or better within three days of completion of construction. The permittee shall notify the Coastal Commission's North Coast District Office upon completion of restoration activities to allow for a site visit to verify that all restoration activities are complete. If the Commission staff identifies

additional measures necessary to restore the area, such measures shall be implemented as quickly and reasonably as possible.

H. **Noncompliance Provision**. If the permittee is not in compliance with the terms and conditions of any Coastal Commission CDPs or other coastal authorizations that apply to the subject properties at the time that a maintenance event is proposed, then the maintenance event that might otherwise be allowed by the terms of this future maintenance condition shall not be allowed by this condition until the Executive Director has determined that the permittee is in full compliance with all terms and conditions.

I. **Emergency**. Nothing in this condition shall affect the emergency authority provided by Coastal Act Section 30611, Coastal Act Section 30624, and Subchapter 4 of Chapter 5 of Title 14, Division 5.5, of the California Code of Regulations (Permits for Approval of Emergency Work).

J. **Duration of Covered Maintenance**. Future maintenance under this CDP is allowed subject to the above terms until the end of the authorization period for the new segment of revetment allowed by Special Condition 4. The intent of this permit is to allow for maintenance to occur without obtaining an otherwise necessary coastal development permit amendment throughout the period of development authorization unless there are changed circumstances that may affect the consistency of this maintenance authorization with the policies of Chapter 3 of the Coastal Act.

4. **Length of Development Authorization for New 600-Foot-Long Portion of Revetment.** The new 600-foot-long portion of the revetment authorized by this permit is authorized only until the earlier of July 1, 2026 or when the existing sewer main the revetment is designed to protect (a) is redeveloped, (b) is removed or abandoned, or (c) no longer requires the shoreline revetment for protection, whichever occurs first. Prior to the expiration of the authorization period of the new portion of the revetment, the permittee or its successors shall submit to the Commission an application for a coastal development permit amendment to either (a) remove the new portion of the revetment in its entirety, or (b) extend the length of time the new portion of the revetment is authorized and modify its design or configuration as needed to ensure consistency with the Coastal Act. If a complete application is filed before the end of the authorization period, the authorization period shall be automatically extended until the time the Commission acts on the application. Any amendment application shall conform to the Commission's permit filing regulations at the time and shall at a minimum include the following:

A. An evaluation of alternatives to the shoreline revetment that can eliminate and/or reduce impacts to public access, public views, shoreline processes, marine resources, aquatic intertidal habitat, and other coastal resources at the site while minimizing risks of geologic and flood hazards and assuring structural stability. These alternatives shall include, but not be limited to: (a) removing or relocating the sewer main inland and removing or relocating the revetment inland; (b) modifying the design of the existing revetment to address long term erosion hazards including those resulting from sea level rise; (c) replacing the existing revetment with a living shoreline designed to protect the sewer main from shoreline flooding hazards; and (d) removing or relocating the sewer main inland and replacing the existing revetment with a living shoreline. The information concerning these alternatives must be sufficiently detailed

to enable the Coastal Commission to evaluate the feasibility of each alternative for addressing consistency with the Coastal Act. The analysis shall include a feasibility analysis of the alternatives that evaluates and considers all potential constraints, including geotechnical and engineering constraints, potential phasing options with timelines, project costs, and potential funding options;

B. Proposed mitigation for unavoidable coastal resource impacts associated with each of the alternatives including retention of the new portion of the revetment beyond the initial authorization period; and

C. A survey of the revetment prepared by a licensed geologist, or civil or geotechnical engineer and a comparison of the revetment's current geometry to the as-built plans (Exhibit 3, pg. 4), including a comparison of slope, crest height, width, and location relative to surrounding topography.

5. **Assumption of Risk, Waiver of Liability and Indemnity.** By acceptance of this permit, the permittee acknowledges and agrees (i) that the site may be subject to hazards, including but not limited to waves, storms, tsunamis, flooding, erosion, and earth movement, many of which will worsen with future sea level rise; (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

The City of Eureka has applied for authorization of the revetment repair and expansion conducted in January 2016 on the Humboldt Bay shoreline in southern Eureka in part under an emergency permit. The City is seeking permanent authorization for the installation of a 10-foot-wide by 300-foot-long segment of revetment conducted under Emergency Permit No. G-1-16-0003 (Exhibit 9) issued on January 8, 2016. In addition, the City is asking for after-the-fact authorization for five additional feet of width and 300 additional feet of length of new revetment installed at the same time as the emergency work. The City is also seeking after-the-fact authorization for repairs to four isolated segments of existing revetment, totaling 285 linear feet, located directly north of the new segment of revetment. These repairs were performed in January 2016 in conjunction with construction of the new segment of revetment. The entire project resulted in the placement of approximately 2,000 tons of additional rock along 885 feet of the Humboldt Bay shoreline.

Proposed New Segment of Revetment

During the winter of 2015-2016, extreme high tides coupled with storm activity eroded an unfortified segment of Humboldt Bay shoreline landward as much as 25 feet in places,

threatening to expose a buried sewer main that parallels the shoreline (See Exhibit 4 for photographs of the shoreline erosion). In response, the City constructed a 600-foot-long rock revetment and backfilled behind the revetment to reestablish the location of the shoreline that existed prior to winter erosion. An excavator working from the beach at low tide dug a 4-foot-wide by 4-foot-deep trench in the sand along 600 feet of shoreline to provide a keyway for the new segment of revetment. The spoils from this trench were then used to form a berm on the landward side of the trench. The back of the excavator bucket was used to shape and lightly compact the berm, creating the sloped face of the revetment. Next, geotextile fabric was placed in the trench and up and over the berm. One-ton (Class 4) boulders were placed in the keyway trench and were used to form the bulk of the revetment and ½ ton rocks were placed as facing. After facing was complete, the remaining voids behind the trench were filled with spoils and imported river rock. Materials behind the trench were compacted with the excavator bucket and then with heavy equipment driven over the land. See Exhibit 5 for photographs of the site during construction.

The 2015-2016 winter storms also undermined a row of seven Monterey Pine trees that was planted along the unfortified shoreline west of the sewer main, at the northern end of the proposed new revetment. One tree was lost, and four more (measuring 16-24 inches diameter at breast height) were removed by the City during the construction of the revetment.

As constructed, the new segment of revetment has a width of approximately 15 feet, a crest height ranging from approximately 10 to 13.2 feet in elevation (NAVD 88), and a 1.5 (horizontal): 1 (vertical) slope (See Exhibit 3, pg. 5 for a surface profile of the proposed new portion of the revetment). The new segment of revetment extends along a smooth concave arc, connecting to the existing portion of the revetment to the north and a rocky point to the south. See Exhibit 6 for photographs of the proposed new portion of the revetment.

Proposed Repairs to Preexisting Revetment

Portions of the preexisting revetment directly to the north of the new segment of revetment also suffered erosional damage during the winter of 2015-2016 (See Exhibit 4, pg. 3). Underlying smaller rocks and loose sandy backfill were washed out through voids between the larger revetment facing rocks, resulting in undercutting of the land behind the revetment, including undercutting of the California Coastal Trail and an associated picnic area at the Truesdale Vista Point/Trailhead. To address this erosion, the City placed geotextile fabric in existing voids in four isolated areas of the preexisting revetment (totaling 285 linear feet), and backfilled the voids with river run rock and larger rock up to 12 inches (See Exhibit 3, pg. 3 for a map of repairs and Exhibit 6, pg. 3 for a photograph of repairs). The crest height of the preexisting revetment in the vicinity of the repairs ranges from 9.8 to 10.4 feet in elevation (NAVD 88).

Overall

Equipment staging and material stockpiling were conducted directly east of the proposed revetment development and Coastal Trail, on vacant land owned by the City. This area was formerly the site of a City industrial yard and contains no wetlands or other sensitive habitat areas.[1] Revetment work was conducted at low tide to avoid any contact with coastal waters. In

[1] SHN Consulting Engineers & Geologists, Inc. (January 2007). Biological Assessment for the Elk River Wildlife Trail Improvement Project. Prepared for the City of Eureka.

addition, all areas seaward of the Coastal Trail were plated with steel construction plates prior to heavy machinery access to protect the underlying sewer line and to minimize disturbance of vegetation along the shore. All disturbed areas were seeded and covered in straw to prevent erosion, and all equipment and unused materials were removed from the site immediately upon completion of construction.

B. PROJECT BACKGROUND & SETTING

Proposed New Segment of Revetment

The proposed new 600-foot-long segment of revetment is located along the eastern Humboldt Bay shoreline in southern Eureka, extending from directly south of the McCullens Avenue sewer pump station to just north of the Elk River Spit, an approximately 6,600-foot-long sand spit at the mouth of the Elk River (Exhibit 2). Due to its location between the project site and the bay entrance, the Elk River Spit has historically protected the subject shoreline from wind-blown waves. Based on aerial imagery dating back to the 1950s, the edge of the unarmored shoreline in this area was stable for decades prior to the sudden and significant erosion that occurred in the winter of 2015-2016 (Exhibit 10).

During the El Niño winter of 2015-2016, extreme high tides coupled with southwestern storm winds produced unusually high waves directed toward the subject bay shore, resulting in erosion of the shoreline landward as much as 25 feet in places. The eroded shoreline encroached within a few feet of a 36-inch steel pressurized sewer main which runs parallel to the shoreline, and exposed a concrete manhole along the sewer main (See Exhibit 4, pg.1). This force main was installed in 1981 in conjunction with the construction of Eureka's Elk River Wastewater Treatment Plant (WWTP), and is one of the primary feeds to the plant (See Exhibit 8 for a map of the City's wastewater infrastructure). The erosion of the shoreline in the winter of 2015-2016 also undermined a row of seven Monterey pine trees that were planted west of the sewer main, resulting in the loss of one tree and the removal of four (See Exhibit 4, pages 2-3; and Exhibit 5, page 3).

The California Coastal Trail also runs along this stretch of shoreline, approximately ten feet shoreward of the buried sewer main. This portion of the California Coastal Trail is a multi-use, ADA-compliant facility known locally as the Hikshari Trail, approved under CDP 1-11-037 in March 2012. The land east of the trail is currently vacant, although the City has secured a coastal development permit to construct a playground directly south of the McCullens Avenue sewer pump station (CDP 1-11-037-A1). Other than the previously mentioned row of Monterey pine trees, unpaved uplands in the project area are largely covered with grasses and forbs.

The subject shoreline is located between an approximately 140-foot-long armored point of land to the south (comprised of unengineered poured concrete and rubble) and the southern end of the approximately 520-foot-long preexisting revetment to the north proposed to be repaired. The armored point to the south is likely the remnant of a historic wharf that was constructed in the mid-1800s and existed in that location until the late 1940s or early 1950s (See Exhibit 10, pg. 1).

Proposed Repairs to Preexisting Revetment
The preexisting segment of revetment to be repaired was installed in early 2006 after high tides, ocean swells, and wind waves eroded significant portions of the bank during the "New Year's Storm" of December 31, 2005 through January 1, 2006.[2,3]

Portions of this existing revetment also suffered erosional damaged during the winter of 2015-2016. Underlying smaller rocks and loose sandy backfill piped through voids between the larger revetment facing rocks, resulting in erosion of the land behind the revetment. Along this portion of shoreline, the Coastal Trail and an associated picnic area are located directly adjacent to the revetment (bayward of the buried sewer main). In places, the land underneath the paved trail and picnic area was undercut as a result of the aforementioned erosion (See Exhibit 4, page 4).

In addition to the sewer main and trail, the northern segment of revetment protects (from north to south) the foot of Truesdale Street, the Truesdale Vista Point/Trailhead, and the McCullens Avenue pump station. The Truesdale Vista Point/Trailhead, historically a dirt parking lot, was paved and improved in 2012 (under the CDP for the Hikshari' Trail) and now includes 23 public parking spaces, a public restroom, benches, picnic tables, bike racks, informational kiosks, and interpretive signage. The McCullens Avenue pump station replaced a small wastewater treatment plant at McCullens Avenue when the Elk River WWTP was constructed in 1981. This pump station is the final point of conveyance for the City's wastewater collection system before reaching the WWTP.

Overall Project Area
The project area was once the waterfront of the former town of Bucksport, established in the 1850s. The Bucksport and Elk River Railroad (B&ERRR) ran on a trestle over the bay through the project area beginning in 1886, delivering lumber to a lumber yard and wharf at Bucksport. The Eel River and Eureka Railroad (later becoming part of the Northwestern Pacific Railroad) also ran through the project area, parallel to the B&ERRR and the shoreline, approximately 200 feet to the east. While remnants of the B&ERR in the project area are largely gone, the derelict Northwestern Pacific Railroad tracks still exist, running directly east of the trailhead and pump station and approximately 80-90 feet east of the Coastal Trail at the site of the new segment of revetment.

The shoreline in the project area was established through the placement of fill associated with early historical "reclamation" of bay margin areas. The filled former tidelands rise two to five feet above a tidal flat comprised of fine sands. During the recent drastic erosional event, fill debris was exposed in the 2- to 3-foot-high scarp at the landward edge of the eroded area, including pebbles, rocks, concrete and asphalt rubble of various sizes, and other man-made debris mixed with sand and dirt. However, no debris was uncovered during excavation of the revetment

[2] Water levels reach approximately 9.6 feet (NAVD88) at the Humboldt Bay North Spit tide gage on December 31, 2005.

[3] As the armoring constituted immediate emergency work necessary to protect property, was undertaken by a public agency, and was the result of a disaster in an area where the Governor had proclaimed a state of emergency, the construction of the revetment was exempt from coastal development permitting requirements pursuant to Coastal Action Section 30600(e)(1).

keyway, indicating that the site contains a thin veneer of fill overlying loose, unconsolidated bay margin deposits consisting of fine sands.

The project as originally described at the time of the emergency work called for the installation of a new segment of revetment along a 300-foot-long stretch of Humboldt Bay shoreline; however a total of 885 feet of shoreline was affected, including 600 feet of new revetment and 285 feet of repaired preexisting revetment. The lengthening of the project was due in part to identification of additional erosion both north and south of the originally proposed project footprint after issuance of the emergency permit. The new segment of revetment was extended further than authorized by the emergency permit to connect to the preexisting revetment to the north and to hard armoring to the south to prevent further loss of ground and to reduce end effects where concentrated tidal and wind fetch forces could potentially increase the already significant rate of erosion adjacent to the buried sewer main.

C. STANDARD OF REVIEW

The project area is bisected by the boundary between the retained CDP jurisdiction of the Commission and the CDP jurisdiction delegated to the City of Eureka by the Commission through the City's Local Coastal Program (LCP).

Section 30601.3 of the Coastal Act authorizes the Commission to process a consolidated CDP application when requested by the local government and the applicant and approved by the Executive Director for projects that would otherwise require CDPs from both the Commission and a local government with a certified LCP. In this case, the City of Eureka's Public Works Department requested a consolidated permit process and the City of Eureka's Development Services Director agreed to the request on behalf of the City Council on August 10, 2017. The Executive Director also agreed to the consolidated permit processing request.

The policies of Chapter 3 of the Coastal Act provide the legal standard of review for a consolidated CDP application submitted pursuant to Section 30601.3. The local government's certified LCP may be used as guidance.

D. OTHER AGENCY APPROVALS

Humboldt Bay Harbor, Recreation and Conservation District (Harbor District)

The Harbor District has permit jurisdiction over all the tidelands and submerged lands of Humboldt Bay. The Harbor District issued an after-the-fact emergency permit for the project on September 14, 2016.

North Coast Regional Water Quality Control Board (Regional 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. On August 7, 2017, the Regional Board issued an after-the-fact WQC for the project (WDID No. 1B170391WNHU).

California State Lands Commission (CSLC)

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions. The project area includes current tidelands and filled former tidelands of Humboldt Bay. On August 14, 2017, State Lands Commission staff sent a letter to the City of Eureka stating that the project site appears to be located within lands the state did not acquire or patent and were originally federal lands patented by the United States as cash entry patent Serial Number 20, dated November 1, 1860. Thus no state or public trust lands are involved in the development.

U.S. Army Corps of Engineers (Army Corps)

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. On May 9, 2017, the Army Corps issued after-the-fact authorization for the project under Department of the Army Nationwide Permit (NWP) 13 for Bank Stabilization (File Number 2016-00321N).

E. PERMIT AUTHORITY FOR REPAIR & MAINTENANCE

Section 30610 of the Coastal Act provides, in relevant part (emphasis added):

> *Notwithstanding any other provision of this division, no coastal development permit shall be required pursuant to this chapter for the following types of development and in the following areas: …*
>
> *(d) Repair or maintenance activities that do not result in an addition to, or enlargement or expansion of, the object of those repair or maintenance activities; provided, however, that if the commission determines that certain extraordinary methods of repair and maintenance involve a risk of substantial adverse environmental impact, it shall, by regulation, require that a permit be obtained pursuant to this chapter.*

Section 13252 of the Commission administrative regulations (14 CCR 13000 *et seq*.) provides, in relevant part (emphasis added):

> *(a) For purposes of Public Resources Code section 30610(d), the following extraordinary methods of repair and maintenance shall require a coastal development permit because they involve a risk of substantial adverse environmental impact:*
>
> *(1) Any method of repair or maintenance of a seawall revetment, bluff retaining wall, breakwater, groin, culvert, outfall, or similar shoreline work that involves:*
>
> *(A) Repair or maintenance involving substantial alteration of the foundation of the protective work including pilings and other surface or subsurface structures;*

(B) The placement, whether temporary or permanent, of rip-rap, artificial berms of sand or other beach materials, or any other forms of solid materials, on a beach or in coastal waters, streams, wetlands, estuaries and lakes or on a shoreline protective work except for agricultural dikes within enclosed bays or estuaries;

(C) The replacement of 20 percent or more of the materials of an existing structure with materials of a different kind; or

(D) The presence, whether temporary or permanent, of mechanized construction equipment or construction materials on any sand area, bluff, or environmentally sensitive habitat area, or within 20 feet of coastal waters or streams…

(3) Any repair or maintenance to facilities or structures or work located in an environmentally sensitive habitat area, any sand area, within 50 feet of the edge of a coastal bluff or environmentally sensitive habitat area, or within 20 feet of coastal waters or streams that include:

(A) The placement or removal, whether temporary or permanent, of rip-rap, rocks, sand or other beach materials or any other forms of solid materials;

(B) The presence, whether temporary or permanent, of mechanized equipment or construction materials.

All repair and maintenance activities governed by the above provisions shall be subject to the permit regulations promulgated pursuant to the Coastal Act, including but not limited to the regulations governing administrative and emergency permits...

(b) Unless destroyed by natural disaster, the replacement of 50 percent or more of a single family residence, seawall, revetment, bluff retaining wall, breakwater, groin or any other structure is not repair and maintenance under section 30610(d) but instead constitutes a replacement structure requiring a coastal development permit.

The proposed repairs to the previously existing portion of the revetment qualify as a repair and maintenance project under Section 30610(d) of the Coastal Act and Section 13252(b) of the Commission's regulations because the repairs (a) do not involve an addition to or enlargement or expansion of the subject revetment, and (b) do not involve replacement of 50% or more of the entire revetment. The proposed repairs were conducted along 285 linear feet of the approximately 520-foot-long preexisting segment of revetment, and only involved repairs to the crest of the revetment and the upper portion of the revetment face (Exhibit 3, pg. 3).

Although certain types of repair projects are exempt from CDP requirements, Section 13252 of the Commission's regulations requires a coastal development permit for extraordinary methods of repair and maintenance enumerated in the regulation. The proposed repair work involves repairs to an existing revetment and construction activities within 20 feet of coastal waters. The proposed repair project therefore requires a coastal development permit under CCR Sections 13252(a)(1) and 13252(a)(3) of the Commission's regulations.

In considering a permit application for a repair or maintenance project pursuant to the above-cited authority, the Commission reviews whether the proposed method of repair or maintenance is consistent with the Chapter 3 policies of the Coastal Act. The Commission's evaluation of such repair and maintenance projects does not extend to an evaluation of the conformity with the Coastal Act of the existing development.

If not properly undertaken with appropriate mitigation, the necessary revetment maintenance activities could have adverse impacts on coastal resources, including impacts on the biological productivity and quality of Humboldt Bay, visual resources, archaeological resources, and public access. The following findings discuss mitigation measures required as conditions of this CDP to ensure protection of coastal resources and public access. Therefore, as conditioned in these findings, the Commission finds that the proposed method of repair and maintenance is consistent with all applicable Chapter 3 policies of the Coastal Act.

F. HAZARDS

Coastal Act Section 30235 states:

> *Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible.*

Section 30253 of the Coastal Act states in applicable part:

> *New development shall do all of the following:*
>
> *(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*
>
> *(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs…*

Proposed New Segment of Revetment

No Entitlement to Shoreline Protective Device

Together, Coastal Act Sections 30235 and 30253 acknowledge that seawalls, revetments, retaining walls, groins and other such "hard" structures designed to forestall erosion also alter natural landforms and natural shoreline processes. Accordingly, with the exception of new coastal dependent uses, Section 30235 limits the construction of shoreline protective works to those required to protect existing permitted structures or public beaches in danger from erosion. Alternatively, Section 30253 requires that new development be sited, designed, and built in a

manner to not require construction of shoreline protective devices that would substantially alter natural landforms along the shoreline. The Coastal Act provides these limitations because shoreline structures can have a variety of negative impacts on coastal resources including adverse effects on public access, coastal views, aquatic habitats, natural landforms, and overall shoreline and sediment dynamics on and off site.

The Commission finds that under Coastal Act Section 30235, "existing" permitted structures means development existing prior to the effective date of the Coastal Act on January 1, 1977. The new 600-foot-long revetment protects a sewer main permitted in the early 1980s. Because this structure was not constructed and completed prior to the passage of the Coastal Act, the Commission finds that it is not eligible for consideration of shoreline protection pursuant to Coastal Act 30235. As a result, the sewer main is not entitled to a revetment and must be found consistent with all of the Chapter 3 policies of the Coastal Act.

In addition to the sewer main, the proposed new revetment also protects a segment of the California Coastal Trail (the Hikshari Trail) and access support facilities permitted in 2012. The trail may be considered a coastal-dependent use afforded shoreline protective works under Section 30235. However, in addition to only requiring shoreline protective structures to protect coastal-dependent uses, existing structures, or public beaches in danger from erosion, Section 30235 only requires that shoreline protective structures be approved if: (1) shoreline-altering construction is "required" (i.e., necessary) to protect the existing threatened structure (or beach); and (2) the required protection is designed to eliminate or mitigate its adverse impacts on shoreline sand supply. In this case, the shoreline-altering construction is not required to protect the trail. The trail is located approximately ten feet shoreward of the buried sewer main at the site of the new revetment and is not imminently threatened by erosion without the revetment.[4] In addition, the City owns vacant property inland of the trail where the trail could be relocated. Given that the trail was never imminently threatened by erosion and retreat of the trail is a feasible alternative, the shoreline altering construction is not required to protect the trail and the trail is therefore not entitled to shoreline protection pursuant to Coastal Act 30235.

Consistency with Coastal Act §30253 taking into account sea level rise

Coastal Act Section 30253 requires the proposed revetment to minimize future risk, assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area. The proposed revetment is exposed to wave and tidal action, and was precipitated by previous shoreline erosion from these hazards. By dissipating wave energy and preventing further recession of the backshore, the intent of the proposed revetment is to prevent erosion of the sewer main and Coastal Trail and minimize risk of a sewage spill consistent with Coastal Act Section 30253. However, if not properly designed and maintained, the proposed structure may not remain stable and may fail to minimize risk to life and property by failing to protect the sewer main, inconsistent with Coastal Act Section 30253. Furthermore, the proposed revetment could potentially focus wave energy, redirect currents, and accelerate flows resulting in scour of the shoreline, contributing to erosion inconsistent with Section 30253.

[4] The conditions are different at the site of the preexisting revetment where the trail is located bayward of the sewer main and the trail was directly undermined by erosion prior to the repair work.

Although, as discussed in detail further below, the revetment has been designed to minimize risk to the sewer main, assure stability and structural integrity, and neither create nor contribute to erosion under present conditions, there has been no consideration of consistency with Coastal Act 30253 under potential future conditions given sea level rise. As the proposed project is located in a particularly low-lying area along the Humboldt Bay shoreline, in order to comply with Coastal Act Section 30253, an analysis is necessary of how the proposed project is planned, located, designed, and engineered for the changing water levels, increased wave energy, and other associated impacts that might occur over the life of the development. However, the engineering geology reports prepared for the project do not consider sea level rise.

SHN Consulting Engineers & Geologists, Inc. produced engineering geology reports for the City dated September 2, 2016 and February 28, 2017 that evaluate the design of the proposed revetment and the revetment's potential effect on coastal erosion. The February 2017 report states in relevant part [***emphasis added***]:

> *…The analysis of alternative mitigation options at the site is complicated by the uncertainty regarding future conditions relative to potential impacts related to sea level rise. The entire Humboldt Bay shore is a low-lying geomorphic feature subject to inundation under most sea level rise scenarios, therefore the City of Eureka is engaged in a long-term grant funded study evaluating a variety of adaptation strategies.* ***Presumably, sea level rise impacts will require a comprehensive municipal response regarding the entire infrastructure network in impacted areas near the bay shore. In the meantime, it is important to protect valuable resources from impacts related to current conditions; the emergency repair under consideration here fits into this short-term mitigation category****…*
>
> *…The crest elevation of the riprap is a second important parameter in revetment design. An integral part of this parameter is the design still water level, which typically considers tides, storm surges, and sea level rise. As communicated previously, this emergency repair was neither intended nor designed as a flood protection measure. Rather, the revetment's purpose was to protect the existing shoreline and infrastructure at the site (i.e., a 36-inch pressure sewer main pipeline) from the immediate threat of erosion.* ***Thus, in our selection of the design still water level, we do not consider sea level rise; this is a more global issue and is not within the scope of the revetment's functions****…*
>
> *…The revetment is intended as an erosion control structure to dissipate wave energy and protect the bay shore and nearby infrastructure. It is not intended as flood control mitigation.* ***As discussed above, mitigation for inundation associated with sea level rise is a larger issue being addressed by the City under grant funding to evaluate adaptation strategies. The revetment constructed under emergency conditions last year is intended as a short term strategy to maintain the current bay shore and to protect existing infrastructure****.*

Because the applicant has not accounted for sea level rise in its evaluation of the proposed revetment's design and engineering, the Commission cannot find that the project assures stability and structural integrity over the long term. Humboldt Bay is experiencing the greatest rate of relative sea level rise in the State (due to active land subsidence), with up to 0.9 feet of rise expected by 2030, 1.9 feet by 2050, and 5.3 feet by 2100.[5]

Sea Levels & Project Sea Levels for Humboldt Bay (NAVD88)			
		MMMW*	**MAMW°**
Current Levels		7.74	8.78
2030	Best case	8.14	9.18
	Average	8.34	9.38
	Worst case	8.64	9.68
2050	Best case	8.44	9.48
	Average	8.84	9.88
	Worst case	9.64	10.68
2100	Best case	9.74	10.78
	Average	10.94	11.98
	Worst case	13.04	14.08

*MMMW = mean monthly maximum water level
°MAMW = mean annual maximum water level

As sea levels rise, wave run-up and overtopping of the revetment will occur with greater frequency, until the structure is eventually submerged. The crest of the new revetment is 10 to 13.2 feet in elevation (NAVD88). Portions of the revetment may be tidally inundated by a mean annual maximum water (MAMW) level of 10.7 feet (NAVD 88) projected under worst-case scenario conditions for 2050, and by mean monthly maximum water ("MMMW") levels between 2070 [10.9 feet (NAVD 88)] and 2100 [13.1 feet (NAVD 88)].

On the California coast the effect of sea level rise will be the landward migration of the intersection of the sea with the shore, leading to a loss of the intertidal zone at the project site as the tidal flat is squeezed between the landward migrating bay and the fixed backshore. These changes will expose the revetment to more frequent wave attack and increased risk of erosion. As sea levels rise, overtopping will occur with increasing frequency, causing wave-induced scour of the revetment and the land behind the revetment. Eventually, these forces will result in a destabilization of the revetment. In addition, if increased erosion exposes the sewer main, the sewer main could rupture, as the land above the pipe is necessary to protect the sewer main and ballast it in place. Therefore the Commission cannot find that the revetment will assure structural stability and minimize risk for an indefinite authorization period consistent with Coastal Act 30253.

[5] Relative sea level rise estimations from: Trinity Associates (2015, February). *Sea Level Rise Adaptation Planning Project: Phase II Report*, based on: Northern Hydrology and Engineering (2014). *Humboldt Bay Sea Level Rise Hydrodynamic Modeling and Inundation Vulnerability Mapping*.

Thus **Special Condition 4** sets a limited authorization period for the new revetment of the earlier of July 1, 2026, or until the time when the currently existing segment of sewer main warranting armoring (1) is redeveloped, (2) is no longer present and/or (3) no longer requires armoring for such protection, whichever occurs first. As discussed further below, this limited authorization period will allow the City time to complete a comprehensive evaluation of the structure's stability taking into account projected sea level rise, or plan for removal of the revetment in coordination with a planning effort that the City is already undertaking to evaluate upgrades and reconfigurations of its entire wastewater system. As mentioned above, under the worst case scenario, Humboldt Bay will experience 0.9 feet of sea level rise by 2030. Under this scenario, the crest of the revetment will still be above average king tides and risks to the revetment's stability and the safety of the pressurized sewer main that it protects will not be substantially increased.

Thus, as conditioned to require a limited period of development authorization that extends no later than July 1, 2026, the proposed new portion of the revetment minimizes risks, assures stability and structural integrity, and neither creates nor contributes significant to erosion consistent with Coastal Act Section 30253.

The City is already considering a major overhaul of its wastewater treatment system to comply with requirements of the Regional Water Quality Control Board ("Regional Board"). On June 16, 2016, the Regional Board issued a cease and desist order (Cease and Desist Order No. R1-2016-0012) to the City for prohibited bypass of secondary treatment and prohibited discharges not compliant with the State Water Board's Water Quality Control Policy for the Enclosed Bays and Estuaries of California. The cease and desist order (CDO) requires the City to identify and assess alternatives and ultimately implement preferred alternative(s) to come into compliance. As coming into compliance will require major facility upgrades and potentially a reconfiguration of the wastewater system, the CDO includes a time schedule with various deadlines. The CDO first requires a feasibility study by July 1, 2020 that evaluates and recommends alternatives to achieve compliance, and then requires submittal of preliminary design plans by July 2022, an Environmental Impact Report by July 2023, complete design plans by July 2024, securement of all necessary permits by July 2026, and construction of the preferred alternatives by July 2030.

In addition, the Regional Board's current National Pollutant Discharge Elimination System (NPDES) permit for the City's Wastewater Treatment Plant requires the City to submit a "Climate Change Readiness Study Plan" to the Regional Board by July 1, 2020 "to ameliorate climate-induced impacts such as changing influent and receiving water quality and conditions, as well as the impact of rising sea level, storm surges and back-to-back severe storms that are expected to become more frequent" (Waste Discharge Requirements Order No. R1-2016-0001). The feasibility study required by the cease and desist order (also due July 2020) must include a summary of how the Climate Change Readiness Study Plan was considered in selecting the preferred alternative(s) for addressing the wastewater system's inadequacies. According to the Regional Board's permit condition, the Climate Change Readiness Study Plan is required to include (1) an assessment of the wastewater treatment facility, operations, collection and discharge systems to determine areas of short and long term vulnerabilities related to climate change; (2) identification of control measures needed to protect, improve, and maintain wastewater infrastructure, waste discharge compliance, and receiving water quality under

changing climate conditions; and (3) development of a schedule to implement necessary control measures. Because this plan is required to consider the vulnerability of the wastewater system as a whole, including the collection system, the subject sewer main will be evaluated as part of this plan.

The City acknowledges that removal or relocation of the sewer main is a known possibility. In a letter responding to Commission staff dated November 28, 2017, City states as follows [***emphasis added***]:

> *The City is currently working with the North Coast Regional Water Quality Control Board through our current NPDES permit to explore design alternatives to various aspects of our sewer collection and treatment system, including the cross-town interceptor which was exposed during the events described above. Those studies include examining alternatives in light of potential future sea level rise, a design variable not considered in the current analysis for the emergency project. In order to comply with our current NPDES permit, the City must analyze alternatives for the entire sewer treatment system including the treatment facility, pump stations and pressure conveyance lines, taking into account projected sea level rise. The City is required to complete all analysis and secure all required environmental permits for the selected alternative by 2026. We believe that the current permit should take these efforts into account.* ***Therefore, the City is requesting that if the Commission is not willing to issue an indefinite approval for the emergency revetment that the Coastal Development Permit be valid until at least 2026 to coincide with the broader planning efforts currently underway****.*

Once alternative upgrades or reconfigurations for the City's entire wastewater system are analyzed by the City in light of sea level rise as required by the Regional Board and a preferred alternative is selected for facility upgrades or reconfiguration, the subject sewer main may be targeted for removal or relocation. Therefore **Special Condition 4** authorizes the new revetment to remain only until the earlier of July 1, 2026 or until the currently existing sewer main (1) is redeveloped, (2) is no longer present and/or (3) no longer requires armoring for such protection, whichever occurs first. Under the Regional Board's CDO timeline, the City is required to obtain all permits necessary to implement the preferred alternative for the wastewater system by July 1, 2026, including Coastal Commission permit authorization. Given that the City is already required to undertake a comprehensive alternatives analysis resulting in major capital investments in the wastewater system, assessing alternatives for the revetment at the time of permitting for the wastewater system upgrades or reconfiguration is feasible and assures consistency with Section 30253 of the Coastal Act.

Special Condition 4 specifies that prior to the expiration of the authorization period of the new revetment, the permittee or its successors shall submit to the Commission an application for a coastal development permit amendment to either (a) remove the new portion of the revetment in its entirety, or (b) extend the length of time the new portion of the revetment is authorized and modify its design or configuration as needed to ensure consistency with the Coastal Act. Special Condition 4 requires the permit amendment application to include an evaluation of alternatives to the shoreline protection that can eliminate and/or reduce impacts to public access, public views, shoreline processes, marine resources, aquatic intertidal habitat, and other coastal resources at the site. Special Condition 4 also specifies that the information concerning these alternatives must be

sufficiently detailed to enable the Coastal Commission to evaluate the feasibility of each alternative for addressing consistency with the Coastal Act.

Consistency with §30253 through July 1, 2026

As described above, Coastal Act Section 30253 requires the proposed revetment to minimize future risk, assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area. The stability of the segment of revetment depends on a number of variables including the sizing of the revetment's rock facing, and the revetment's slope and thickness. The February 2017 engineering geology report submitted for the subject revetment calculated potential wave heights at the project site based on measured wind speeds in the region and fetch across Humboldt Bay and determined that the proposed one ton and one half ton boulders utilized for the revetment facing are a stable rock size to resist the design wave, and that the thickness of the revetment (15 feet wide) is more than adequate given the rock size.[6] SHN also measured the slope of the proposed revetment in the field on January 10, 2017 and found that the slope along the length of the structure remains below a maximum recommended slope of 1.5 horizontal: 2 vertical.[7] Thus the proposed rock size and revetment width are adequate to resist currently expected wave forces and the revetment slope is gradual enough to prevent sliding failures, assuring stability and structural integrity of the proposed revetment under present conditions without creating or contributing significantly to erosion of the site.

Other variables that are critical in revetment design include the design of the revetment's toe and up- and down-shore flanks and whether the revetment is lined with geotextile fabric. Adequate toe protection is necessary to prevent scour and undermining at the base of the revetment, while lining of the revetment with fabric is necessary to prevent migration of shoreline sediments through voids in the structure. Fabric lining also distributes the weight of the armor material to provide more uniform settlement. SHN's reports indicate that the toe of the proposed revetment was keyed into the underlying substrate through the construction of an approximately 4-foot-wide by 4-foot deep trench lined with geotextile fabric and filled with one-tone boulders. The fabric lining placed in the keyway was extended from the keyway up along the landward side of the proposed revetment. Thus the proposed design of the revetment's toe and lining assures the stability and structural integrity of the proposed revetment under present conditions and neither creates nor contributes significantly to erosion of the site.

Regarding the revetment's flanks, if revetments are not rounded at the ends to meet the existing contours of the site, there is an increased potential of scour of the adjacent shoreline and possible undermining and failure of the ends of the revetment. The northern edge of the proposed revetment is integrated into the preexisting segment of revetment to the north and the southern

[6] The engineering analysis follows "Design Guideline 17–Riprap Design for Wave Attack," presented in "Hydraulic Engineering Circular" (HEC) 23 (US DOT, 2009) to calculate a conservative estimate of 0.46 tons for the necessary median riprap particle size based on a design wave height of 2.78 feet. The same design guidelines were used to calculate a minimum riprap layer thickness of 1.3 - 1.9 feet.

[7] The maximum recommended slope was based on "Highways in the Coastal Environment – Hydraulic Engineering Circular 25, 2nd Edition" (US DOT Federal Highway Administration, 2008). The measured slope of the proposed revetment ranged from 2H:1V to 1½H:1V.

edge tapers into an existing rocky point to the south. In addition, the southern end of the proposed revetment is in the lee of the Elk River spit and therefore has a low potential for wave action. Thus, the proposed design of the revetment's edges assures the stability and structural integrity of the proposed revetment under present conditions and neither creates nor contributes significantly to erosion of the site.

Another key variable in assuring that the structure's design is consistent with Coastal Act Section 30253 under present conditions is the crest height of the revetment. The height of the revetment should be based on maximum water levels and the potential for wave run-up. The crest of the proposed revetment extends less than one foot above the adjacent landward grade, ranging from approximately 10 to 13.2 feet in elevation (NAVD 88). The February 2017 engineering geology report calculated a minimum required elevation of 8.1 feet (NAVD 88) based on a mean sea level of 3.4 feet (NAVD 88), a storm surge height of 1.1 feet, and a wave run-up height of 3.6 feet.[8] This estimate is based on a severe storm under average tidal conditions (i.e. mean sea level).

While mean sea level is 3.4 (NAVD 88 as measured at NOAA's North Spit Tide Gage), the current mean monthly maximum water (MMMW) elevation on Humboldt Bay is 7.74 feet (NAVD 88) and the average annual king tide elevation is 8.78 feet (NAVD 88). During extreme tidal events, storm surge, and periods of heavy stormwater runoff, water can reach up to two feet above tidal baseline elevations, with water levels during recent extreme tides in December 2016 and January 2017 reaching over 9 feet (NAVD 88) at the North Spit tide gage (9.5 feet on December 14, 2016 and 9.4 feet on January 11, 2017). While the 10 to 13.2 foot elevation of the revetment is higher than the highest water levels currently experienced on Humboldt Bay (with high tides and storm surge), it is not tall enough to prevent overtopping during these tides given wave run-up. Storm events coupled with high tides could therefore lead to overtopping. However, given historic trends, these overtopping events are not likely to occur with a great enough frequency to destabilize the revetment or cause significant scour on the landward side of the revetment. Therefore the crest height of the revetment is adequate to assure structural stability under present conditions.

The proposed revetment could also potentially focus wave energy and redirect and/or accelerate flows resulting in scour of the shoreline, contributing to erosion inconsistent with Section 30253. The proposed revetment forms a smooth concave arc that mimics the pre-existing shoreline and does not project as far bayward as the preexisting armoring to the north and south. Therefore the new revetment has a low potential to redirect flows. In addition, the proposed revetment is located on a stretch of shoreline at the outlet of the Elk River spit that is protected by the spit from wind-blow waves coming from the bay entrance and is known to be a depositional area for the Elk River's sediment load. The bay floor directly west of the proposed revetment is a smooth, low gradient mud flat that does not appear subject to significant longshore flow velocity. According to the February 2017 engineering geology report, as a result of these site and structural

[8] The mean sea level was based on measurements at the North Spit tidal station located approximately 1.25 miles away from the revetment site. The storm surge height was based on the average difference between the predicted tides and the measured tides for two significant storm events (the December 31, 2005 storm and the storm of January 8-9, 2016, which led to the revetment construction). The wave run-up was calculated using follows "Design Guideline 17–Riprap Design for Wave Attack," presented in "Hydraulic Engineering Circular" (HEC) 23 (US DOT, 2009).

characteristics, there is minimal potential for scour of the revetment or adjacent shoreline under present conditions.

Given the dynamic shoreline environment, rock revetments require maintenance over time to prevent dislodged revetment materials loosened by wave action or other forces from destabilizing the structure. Therefore, to find the proposed project consistent with Coastal Act Section 30253, the new revetment must be maintained in its approved state. Further, to ensure that the City and the Commission know when repairs or maintenance are required, the City must regularly monitor the condition of the subject armoring. Such monitoring will ensure that the City and the Commission are aware of any damage to or weathering of the armoring and can determine whether repairs or other actions are necessary to maintain the armoring. Therefore, **Special Conditions 2** and **3** require a monitoring and maintenance program. Special Condition 2 requires annual monitoring, including evaluation of the condition and performance of the subject armoring, and documentation of all inspection dates, monitoring observations, and proposed maintenance activities. Special Condition 3 allows the permittee to maintain the project in its approved state, as identified by the special conditions, and requires routine maintenance to address erosion of the revetment.

Such future monitoring and maintenance activities will be understood in relation to the as-built plans submitted by the City. The City created an as-built georeferenced high-resolution ortho-mosaic aerial image of the new revetment photographed from an unmanned aerial vehicle and spatially corrected by using ground-based control surveyed by an SHN surveyor (Exhibit 3, pg. 4). A digital elevation model was also derived from the image and ground control points. The ortho-mosaic image and digital elevation model provide a base map that can be compared to future surveys to assess changes in the geometry of the revetment. Special Condition 2 requires the City to monitor the profile and footprint of the revetment to assess whether the revetment has been altered from this base map, and Special Condition 3 requires maintenance of the revetment to prevent the revetment from encroaching bayward of its authorized footprint. In addition, Special Condition 4 requires the City to submit an application for a coastal development permit amendment at the end of the defined authorization period for the revetment that must include an updated survey of the revetment prepared by a licensed geologist, or civil or geotechnical engineer with a comparison of the current base map to the revetment's geometry at the time of the updated survey.

Finally, in terms of recognizing and assuming the hazard risks for shoreline development, the Commission's experience in evaluating proposed development in areas subject to hazards has been that development has continued to occur despite periodic episodes of heavy storm damage and similar occurrences. Development in such dynamic environments is susceptible to damage due to such long-term and episodic processes. Past occurrences statewide have resulted in public costs (through low interest loans, grants, subsidies, direct assistance, etc.) in the billions of dollars. As a means of allowing continued development in areas subject to these hazards while avoiding placing the economic burden for damages onto the people of the State of California, applicants are regularly required to acknowledge site hazards. Accordingly, **Special Condition 5** requires the permittee to assume all risks for developing at this location and indemnify the Commission from any claims arising from construction or operation of the development.

As conditioned, including the condition limiting the authorization period, the proposed new revetment minimizes risks, assures stability and structural integrity, and neither creates nor contributes significant to erosion consistent with Coastal Act Section 30253.

Proposed Repairs to Preexisting Revetment

Consistency with §30253

The existing revetment, constructed under an emergency waiver in 2006, shows signs of slumping and settlement. Many revetment rocks have migrated onto the tidal flat and there is ongoing erosion of the shoreline behind the revetment from shoreline material piping through voids in the rock facing. By placing geotextile fabric and backfilling with rock at four significantly eroded areas behind the revetment in January 2016, the City remediated previous erosion and slowed future erosion. However, the isolated repairs did not resolve the underlying design issues of the revetment, and shoreline material continues to wash out through voids in the rock facing. In addition, there is visible slumping in one or more of the repair locations where the smaller rocks placed during the repair have migrated down into the rock slope protection, and geotextile fabric placed during the repair is already exposed in a number of locations.

As previously mentioned, in considering a permit application for a repair or maintenance project, the Commission reviews whether the proposed method of repair or maintenance is consistent with the Chapter 3 policies of the Coastal Act. The Commission's evaluation of such repair and maintenance projects does not extend to an evaluation of the conformity with the Coastal Act of the existing development. While the repair work did not resolve the structural issues of the revetment, the method of repair and maintenance did not create or contribute to erosion, and ultimately reduced erosional risk. In addition, **Special Conditions 2** and **3** require ongoing monitoring and maintenance, respectively, of the repaired revetment. Thus the method of revetment repair and maintenance minimizes future risk and neither creates nor contributes significantly to erosion consistent with Coastal Act 30253.

G. FILL IN COASTAL WATERS & PROTECTION OF MARINE RESOURCES

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

> *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:

> *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:

(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 construction of 600 linear feet of new revetment and the repair of 285 linear feet of existing revetment along Humboldt Bay. The California Coastal Commission's Administrative Regulations recognize wetlands within or adjacent to deep-water habitats where vegetation is lacking and soil is poorly developed or absent as a result of wave action, and define the upland limit of wetlands without vegetation or soils as the boundary between land that is flooded or saturated at some time during years of normal precipitation, and land that is not [§13577(b)(1)(C)[9]]. In a tidal estuary, this upland limit would correspond to the mean annual maximum water level, which is 8.78 feet (NAVD88) on Humboldt Bay.

[9] § 13577 states in applicable part:

The subject shoreline consists of filled former tidelands above a tidal flat. The tidal flat is entirely below 8.78 feet in elevation and thus constitutes wetlands (the tidal lands at the base of the uplands range from approximately five to seven feet elevation). During the El Niño winter of 2015-2016, the filled former tidelands that compose the shoreline at this location were eroded landward in locations as much as twenty-five feet. The avulsion calved off the previously existing filled land as it progressed, creating a several-foot-high vertical face between the uplands (the filled former tidelands) and the tidal wetlands (See Exhibit 4, pg. 1). The proposed new revetment, totaling approximately 9,000 square feet in area, was installed seaward of that face entirely on tidal wetlands. Because of the uneven nature of the shoreline erosion, in some areas backfill was added between the uplands and the revetment while in other areas the revetment was constructed directly against the seaward face of the uplands. This backfill resulted in approximately 3,780 square feet of additional fill on tidal wetlands. In total, the proposed new revetment construction resulted in approximately three tenths of an acre of wetland fill. The area of wetland fill is delineated on Exhibit 3, page 4 (identified as the limit of 2016 erosion).

The proposed 285 linear feet of repairs to the preexisting revetment occurred along the crest of the revetment and the upper portion of the revetment face above 8.78 feet elevation and therefore do not constitute fill of coastal waters.

Section 30233 of the Coastal Act limits the fill of coastal waters to specific, enumerated uses, and also requires that any project which results in fill of coastal waters (a) be the least environmentally damaging feasible alternative, and (b) provide feasible mitigation measures to minimize adverse environmental effects. In addition, Coastal Act Sections 30230, 30231, and 30233 together require that marine resources, the biological productivity and quality of coastal waters, and the functional capacity of estuaries be maintained and enhanced.

Allowable Use

The new segment of the revetment was constructed to prevent exposure of a 36-inch pressure sewer main to tidal waters. The subject sewer main is part of the "Cross-Town Interceptor," that

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For purposes of Public Resources Code Sections 30519, 30600.5, 30601, 30603, and all other applicable provisions of the Coastal Act of 1976, the precise boundaries of the jurisdictional areas described therein shall be determined using the following criteria:…

(b) Wetlands.

(1) Measure 100 feet landward from the upland limit of the wetland. Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats. For purposes of this section, the upland limit of a wetland shall be defined as:

(A) the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover;

(B) the boundary between soil that is predominantly hydric and soil that is predominantly nonhydric; or

(C) in the case of wetlands without vegetation or soils, the boundary between land that is flooded or saturated at some time during years of normal precipitation, and land that is not…

moves wastewater under pressure from the northwest section of the City to the Elk River WWTP at the southeast end of the City. This segment of the Cross-Town Interceptor is located just south of the McCullens Avenue pump station, the final point of conveyance of the City's wastewater collection system before reaching the treatment plant approximately one half mile to the south (See Exhibit 9). Any loss of function along this segment of the Cross-Town Interceptor would impact a large service area.

As mentioned above, any proposed filling, diking, or dredging in coastal waters must be for one of the seven allowable uses listed under Section 30233(a) of the Coastal Act. "Incidental public services purposes" is an allowable use of fill under Coastal Act Section 30233(a)(4).

Such fill may qualify as being for an "incidental public service" if the project does not increase the service capacity of the infrastructure and the purpose of the fill is incidental to the primary service provided by the infrastructure. In this case, the purpose of the fill is to protect public wastewater infrastructure and to prevent public health impacts and other devastating environmental consequences of raw sewage being released into the bay. In addition, the project will not increase the service capacity of the wastewater collection system as the sewer main will not be altered or enlarged. To ensure the new revetment is truly incidental to the primary wastewater conveyance service provided by the sewer main, the authorization for the revetment must be tied directly to the existence of the sewer main. Therefore, **Special Condition 4** sets a limited authorization period for the new revetment that in part authorizes the revetment until the earlier of July 1, 2026 or the time when the currently existing sewer main warranting armoring (1) is redeveloped, (2) is no longer present and/or (3) no longer requires armoring for such protection, whichever occurs first. As conditioned, the structure will remain incidental to the sewer main, consistent with the allowable use provisions of Section 30233.

Least Environmentally Damaging Feasible Alternative

As mentioned above, the Commission must ensure that the proposed fill for the new revetment has no less environmentally damaging feasible alternative consistent with Section 30233 of the Coastal Act. 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: (a) authorizing revetment development in coordination with planning efforts for the sewer main; (b) immediate removal or relocation of the new segment of revetment; (c) modification of the design of the revetment at its current location; and (d) replacement with "soft" armoring.

a. <u>Authorizing revetment development in coordination with planning efforts for the sewer main</u>

   As discussed in the section on wetland fill mitigation below, the proposed revetment will result in long-term impacts to aquatic habitat, and thus removal or inland relocation of the revetment would be less environmentally damaging alternatives if it were feasible. Removal of the new revetment or relocation of the revetment inland could become feasible if the subject sewer main was removed or relocated. Given the severity of potential impacts to water quality and marine resources from a sewage spill and the significant potential flooding and wave action at the project site, the extra margin of protection the

sewer main would gain by relocating the sewer main inland would also be beneficial in its own right.

Because the construction of the new revetment was undertaken under emergency conditions, no analysis of alternatives was completed prior to development. The City has since submitted an alternatives analysis, but the analysis only focuses on the lack of feasible alternatives at the time of the emergency work. In a letter to Commission staff dated October 17, 2016, the City states:

> *This project was conducted under the threat of immediate and serious impacts to both the city's sewer system and the environment of Humboldt Bay. Relocation, elevation, or other design and construction intensive efforts were not feasible within the available time and funding constraints.*

In an engineering geology report dated February 28, 2017 (prepared by the City's consultant SHN Consulting Engineers & Geologists, Inc.), the City further clarifies that the emergency repair is a short term strategy to protect the sewer main from the immediate threat of erosion:

> *The sewer line is part of what is referred to as the "Cross-Town Interceptor," an integral part of the City's sewage system that carries wastewater from a majority of the City as part of a coordinated pumping regime. Relocation of the pipe is not an option at this time, because it extends to an existing pump station near Truesdale Avenue; relocation of that pump station would involve major re-engineering of a significant part of the City's wastewater conveyance system, which is beyond the scope of this localized shoreline repair.*

The sewer main was constructed in its current location for a variety of reasons, including the cost efficiency of using public, undeveloped lands free of other underground utilities and utilizing the most direct route from the pump station to the WWTP. The City indicates that the McCullens Avenue pump station which is located inland of the sewer main would need to be relocated further inland in order to relocate the sewer main. The City owns vacant land on the inland side of the pump station where the ground elevation is relatively the same as where the sewer main is currently buried. No evidence has been provided that it would be infeasible to retrofit the station to connect the outflow from the pump station to the interceptor on the inland side of the station rather than the bayward side as it is configured currently. Further, the McCullens Avenue pump station was constructed in conjunction with the WWTP and subject sewer main in the early 1980s and is also threatened by sea level rise given its low, 10.4-foot elevation (NAVD 88). Relocating the sewer pipe in conjunction with the pump station would minimize risk and allow for migration of valuable aquatic habitat as the shoreline retreats inland from erosion.

It is known that the Cross-Town Interceptor and the McCullens Avenue pump station may be removed, relocated, retrofitted, or otherwise reengineered given the fact that the City is already considering a major overhaul of its wastewater treatment system to comply with requirements of the Regional Water Quality Control Board ("Regional Board"). As discussed in the Hazards findings above, on June 16, 2016, the Regional Board issued a cease and

desist order (CDO) to the City for prohibited bypass of secondary treatment and prohibited discharges not compliant with the State Water Board's Water Quality Control Policy for the Enclosed Bays and Estuaries of California. The CDO requires the City to identify and assess alternatives and ultimately implement preferred alternative(s) to come into compliance. The City must obtain all necessary permits to construct the preferred alternative by July 2026.

In addition, the Regional Board's current National Pollutant Discharge Elimination System (NPDES) permit for the City's Wastewater Treatment Plant requires the City to submit a "Climate Change Readiness Study Plan" to the Regional Board by July 1, 2020 "to ameliorate climate-induced impacts such as changing influent and receiving water quality and conditions, as well as the impact of rising sea level, storm surges and back-to-back severe storms that are expected to become more frequent" (Waste Discharge Requirements Order No. R1-2016-0001). The feasibility study required by the CDO (also due July 2020) must include a summary of how the Climate Change Readiness Study Plan was considered in selecting the preferred alternative(s) for addressing the wastewater system's inadequacies. Because this plan is required to consider the vulnerability of the wastewater system as a whole, including the collection system, the subject sewer main and McCullens Avenue lift station will be evaluated as part of this plan.

The City acknowledges that removal or relocation of the sewer main is a known possibility. In a letter responding to Commission staff dated November 28, 2017, City states as follows [***emphasis added***]:

> *The City is currently working with the North Coast Regional Water Quality Control Board through our current NPDES permit to explore design alternatives to various aspects of our sewer collection and treatment system, including the cross-town interceptor which was exposed during the events described above. Those studies include examining alternatives in light of potential future sea level rise, a design variable not considered in the current analysis for the emergency project. In order to comply with our current NPDES permit, the City must analyze alternatives for the entire sewer treatment system including the treatment facility, pump stations and pressure conveyance lines, taking into account projected sea level rise. The City is required to complete all analysis and secure all required environmental permits for the selected alternative by 2026. We believe that the current permit should take these efforts into account.* ***Therefore, the City is requesting that if the Commission is not willing to issue an indefinite approval for the emergency revetment that the Coastal Development Permit be valid until at least 2026 to coincide with the broader planning efforts currently underway****.*

Once alternative upgrades or reconfigurations for the City's entire wastewater system are analyzed by the City in light of sea level rise as required by the Regional Board, and a preferred alternative is selected for facility upgrades or reconfiguration, the subject sewer main may be targeted for removal, retrofit, or relocation. Therefore **Special Condition 4** authorizes the new revetment to remain only until the earlier of July 1, 2026 or until the currently existing sewer main (1) is redeveloped, (2) is no longer present and/or (3) no longer requires armoring for such protection, whichever occurs first. Under the Regional

Board's CDO timeline, the City is required to obtain all permits necessary to implement the preferred alternative for the wastewater system by July 1, 2026, including Coastal Commission permit authorization. Given that the City is already required to undertake a comprehensive alternatives analysis resulting in major capital investments in the wastewater system, assessing alternatives for the revetment at the time of permitting for the wastewater system upgrades or reconfiguration is feasible and assures consistency with Coastal Act Section 30233.

Special Condition 4 specifies that prior to the expiration of the authorization period of the new portion of revetment, the permittee or its successors shall submit to the Commission an application for a coastal development permit amendment to either (a) remove the new portion of the revetment in its entirety, or (b) extend the length of time the new portion of the revetment is authorized and modify its design or configuration as needed to ensure consistency with the Coastal Act. Special Condition 4 requires the permit amendment application to include an evaluation of alternatives to the shoreline protection that can eliminate and/or reduce impacts to public access, public views, shoreline processes, marine resources, aquatic intertidal habitat, and other coastal resources at the site. Special Condition 4 also specifies that the information concerning these alternatives must be sufficiently detailed to enable the Coastal Commission to evaluate the feasibility of each alternative for addressing consistency with the Coastal Act.

Given the negative impacts of hard armoring on the California coast and the outstanding information regarding the future feasibility of known less environmentally damaging alternatives at this site, limiting the authorization term and requiring a comprehensive alternatives analysis at the time the City is evaluating upgrades and reconfiguration of the City's entire wastewater treatment system consistent with the terms of their cease and desist order is the least environmentally damaging feasible alternative.

b. Immediate removal of the new revetment or relocation of the revetment inland

The proposed revetment could be removed to reestablish the existing condition of the shoreline prior to the proposed armoring and eliminate its impacts on tidal habitat, visual resources, and other coastal resources. However, requiring immediate removal of the completed emergency work would place the buried sewer main that runs adjacent to the shoreline at risk from erosional hazards. As described above, the subject sewer main is part of the "Cross-Town Interceptor," and any loss of function along this segment of the Cross-Town Interceptor would impact a large service area.

If the revetment and its associated backfill were removed, portions of the sewer main would be located as close as several feet to an unarmored shoreline, in immediate danger of exposure to tidal waters including wave attack and wave run-up. As discussed above, the storm surge event that precipitated the emergency repair and expansion of the revetment caused a portion of the unarmored shoreline to retreat as much as 25 feet. Exposure of the sewer main to such storm surge events and the resulting shoreline erosion would accelerate deterioration of the aging pipe, potentially affecting the pipe's ability to function properly. In addition, wave action could erode the soil on top of the pipe that ballasts the line in place and differential buoyancy in adjacent segments of the pipe could

result in pipe rupture. Any compromise of the pipe could in turn result in raw sewage spilling into Humboldt Bay. Tidal inundation would also limit access to the sewer main, making it more difficult to repair and maintain.

In addition, exposure of the sewer main to tidal waters could result in inflow and infiltration of saltwater into the sewer main through cracks and leaking joints. Inflow and infiltration of saltwater into the collection and treatment system could overwhelm the hydraulic and mechanical capacities of the system and upset the biological balance of the treatment plant digesters, causing mechanical failures that could result in the release of raw sewage into Humboldt Bay. The City's WWTP has a dry weather treatment capacity of 8.6 million gallons per day (mgd) and a peak wet weather treatment capacity of 12 mgd, after which the system is designed to bypass secondary treatment. The City's WWTP often approaches 32 mgd during storm and high tide events, indicating an already significant amount of infiltration and inflow into the collection system. The City's WWTP serves the City as well as surrounding unincorporated communities with a total of approximately 45,000 customers.[10] Any impairment of the wastewater treatment facility could potentially affect development throughout the City and its surrounding communities.

Another alternative would be to immediately relocate the revetment landward to reduce the amount of fill encroaching on the tidal flat. However, the revetment must be located bayward of the sewer main to protect the main from wave action, and the crest of the revetment is already within fifteen feet of the sewer main along a significant stretch of the revetment, leaving little room for retreat. The southern end of the revetment is located further from the sewer main (up to 120 feet bayward of the main), but the arced shape of the revetment is necessary to connect the new revetment to the existing armored point to the south to avoid deleterious erosion effects at the ends of the revetment. As a result, immediate relocation of the revetment landward is not a less environmentally damaging feasible alternative.

Although relocation of the sewer main and Coastal Trail may be feasible in the long term, immediate removal or relocation of the sewer main presents financial and engineering obstacles that cannot be resolved. Therefore, immediate removal or relocation of the revetment is not a less environmentally damaging, feasible alternative to the approved project as conditioned.

c. Modification of the design of the revetment in its current location

The engineering geology reports prepared for the subject revetment acknowledge that sea level rise was not taken into account in the design of the revetment, as the revetment's crest elevation was assessed based on a severe storm under average current tidal

[10] The City owns the WWTP but Humboldt Community Services District (HCSD) has purchased approximately 30% of the WWTP's current capacity. HCSD serves the communities of Myrtletown to the east, Cutten to the southeast, Bayview, Ridgewood, Pine Hill, Rosewood, and South Eureka to the south, and Humboldt Hill, King Salmon and Field's Landing to the southwest.

conditions.[11] No analysis has been performed to evaluate wave run-up and overtopping under projected future sea levels and therefore it is unknown at what point in the future the structure's own stability or its ability to protect the sewer main and Coastal Trail from wave-induced scour will be compromised.

Humboldt Bay is experiencing the greatest rate of relative sea level rise in the State (due to active land subsidence), with up to 0.9 feet of rise expected by 2030, 1.9 feet by 2050, and 5.3 feet by 2100.[12] As sea levels rise, wave run-up and overtopping of the revetment will occur with greater frequency, until the structure is eventually submerged. The crest of the new revetment is 10 to 13.2 feet in elevation (NAVD88). The revetment may be tidally inundated by a mean annual maximum water (MAMW) level of 10.7 feet (NAVD 88) projected under worst-case scenario conditions for 2050, and by mean monthly maximum water ("MMMW") levels between 2070 [10.9 feet (NAVD 88)] and 2100 [13.1 feet (NAVD 88)].

Given sea level rise projections, it is clear that the current design of the revetment is not the least environmentally damaging alternative in the long term, as it will eventually be overtopped and undermined by wave action and will no longer provide adequate erosion protection for the sewer main. The applicant has not accounted for sea level rise in its evaluation of the proposed revetment's design and engineering, and it is unclear when the design of the revetment, including the crest height, will no longer be adequate.

However, as described above, **Special Condition 4** authorizes the revetment until the earlier of July 1, 2026 or until the currently existing sewer main warranting armoring is redeveloped, no longer present, or no longer requiring armoring, whichever occurs first. As described in greater detail in the hazard findings above, given the relatively conservative design of the revetment and given that less than a foot of sea level rise is expected by 2030, the revetment will continue to remain stable and assure the safety of the sewer main until 2026. Therefore, modifying the design of the revetment is not a less environmentally damaging feasible alternative to the approved project as conditioned.

d. Replacement with "soft" armoring

The revetment could also be replaced with "soft" armoring. Soft armoring refers to the use of natural or "green" infrastructure like beaches, dune systems, wetlands, and other systems to buffer coastal areas. The row of Monterey pine trees that was undermined by the 2015 winter erosion was a form of soft armoring along this stretch of shoreline, as the trees' root systems helped hold together the unconsolidated fill that comprises the shoreline. However, as evidenced by the 2015 erosion event, planting trees alone will not

[11] To estimate the necessary minimum crest elevation of the revetment, the report added: (1) the current mean sea level at the North Spit tidal station (3.4 feet NAVD 88); (2) 1.1 feet of storm surge (based on storm surge measured at the tidal station during two severe storms), and 3.6 feet of wave run-up (based on a calculation derived from "Design Guideline 17–Riprap Design for Wave Attack," presented in "Hydraulic Engineering Circular" (HEC) 23 (USDOT Federal Highway Administration, 2009).

[12] Relative sea level rise estimations from: Trinity Associates (2015, February). *Sea Level Rise Adaptation Planning Project: Phase II Report*, based on: Northern Hydrology and Engineering (2014). *Humboldt Bay Sea Level Rise Hydrodynamic Modeling and Inundation Vulnerability Mapping*.

prevent shoreline retreat in this location. A more extensive living shoreline such as a salt marsh plain could be established at the site to afford greater protection, but living shorelines require significant time to develop, during which shore reinforcement would need to be maintained to provide continued protection of the threatened infrastructure.

A salt marsh plain or other living shoreline would require a larger footprint than a revetment to provide the same level of protection. Given the current location of the sewer main, the living shoreline would need to encroach bayward of the existing revetment, resulting in additional displacement of the existing intertidal habitat.

However, living shorelines capitalize on the natural ability of beaches, dune systems, wetlands, and other systems to protect coastlines from coastal hazards while also providing benefits such as habitat, recreation area, more pleasing visual impacts, and the continuation or enhancement of ecosystem services. Therefore a living shoreline may be a less environmentally damaging alternative in the future, especially if the living shoreline's footprint would not encroach further bayward than the revetment (which will only be possible if the sewer main is removed or relocated).

In the submitted alternatives analysis prepared by SHN and dated February 28, 2017, the feasibility of a living shoreline is discussed:

> *A "living shoreline" would be difficult to develop at the subject site, due to the localized nature of the repair. Living shorelines are viable long-term mitigation solutions, but should be developed along an entire coastal reach, not in a piece meal fashion along a localized segment of bay shore. In addition, living shorelines require significant time to develop, during which shore reinforcement would need to be maintained to provide continued protection of the threatened infrastructure.*

This analysis acknowledges that living shorelines are a long-term mitigation solution that should not be implemented in a piece-meal fashion. Given that the City owns land to the north and south of the subject site, a comprehensive living shoreline strategy would not be infeasible in the long term. However, the City's analysis does not consider geotechnical and engineering constraints, project costs, and other necessary details to determine what type of living shoreline would be appropriate for the site or even whether this stretch of Humboldt Bay shoreline could accommodate a living shoreline given local coastal processes and forces. Therefore the feasibility of a living shoreline even after the sewer main is relocated or removed is unknown.

As described above, the City is currently exploring alternatives for the entire wastewater system including the treatment facility, pump stations, and pressure conveyance lines, taking into account projected sea level rise, and has requested that any limited authorization of the revetment be valid until at least 2026 to coincide with this broader planning effort. Therefore **Special Condition 4** sets a limited authorization term for the revetment that gives the City a defined deadline to demonstrate that the proposed revetment is the least environmentally damaging alternative. As outlined in Special Condition 4**,** the required alternatives analysis will need to more fully explore the feasibility of a living shoreline, including funding, geotechnical, engineering, and other

feasibility issues; and will need to comparatively evaluate impacts on coastal resources including shoreline processes and habitat.

Therefore replacement of the rock revetment with soft armoring is not a less environmentally damaging, feasible alternative to the approved project as conditioned.

Conclusion Regarding Alternatives

Therefore, for all of the reasons discussed above, limiting the length of development authorization and requiring a comprehensive alternatives analysis in coordination with planning for the sewer main is the least environmentally damaging feasible alternative.

Feasible Mitigation Measures

The Commission must ensure that feasible mitigation measures are provided to minimize adverse environmental effects of the fill 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.[13] 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. Humboldt Bay is also one of the most important migratory stopovers along the United States Pacific Coast and is a globally Important Bird Area and a Western Hemisphere Shorebird Reserve Network site of international significance.[14] The proposed project could have a number of potential adverse effects on the environment of Humboldt Bay, including degradation of water quality caused by construction impacts, altered water circulation patterns, and fill of tidal flats.

Construction impacts on Humboldt Bay

Because the construction of the proposed revetment occurred in close proximity to Humboldt Bay, there is a potential that the proposed project activities could have adversely impacted the water quality and habitat function of coastal waters. To avoid impacts during revetment construction and repair, the permittee staged heavy equipment and stockpiled materials on an upland site inland of the Coastal Trail, and no construction debris was temporarily placed or stored where it may have been subject to entering coastal waters or wetlands. In addition, revetment work was conducted at low tide to avoid any contact with coastal waters, and all areas seaward of the Coastal Trail were plated with steel construction plates prior to heavy machinery access to protect the underlying sewer line and to minimize disturbance of vegetation along the shore. All disturbed areas were seeded and covered in straw to prevent erosion, and all equipment and unused materials were removed from the site immediately upon completion of construction.

[13] Humboldt bay Harbor, Recreation, & Conservation District, 2015.

[14] http://ca.audubon.org/conservation/conservation/seas-shores/humboldt-bay

Therefore feasible mitigation measures were provided to avoid adverse impacts of construction on water quality.

Altered circulation caused by shoreline structure

The proposed new revetment could also affect water quality by altering water circulation patterns. However, the proposed new revetment was designed in a smooth concave arc that mimics the location of the historic shoreline and does not encroach further bayward than the preexisting armored shoreline directly to the north and south. In addition, the northern edge of the proposed revetment is integrated into the existing rock revetment to the north and the southern edge tapers into a preexisting rocky point to the south. Therefore the revetment has been designed to avoid significant impacts to water circulation.

Loss of tidal flat habitat

The tidal flats in the project area are often teeming with foraging shorebirds and waterfowl, evidence of a larger food web including invertebrates, mollusks, crustaceans, and fish. The tidal flats also support native eelgrass (*Zostera marina*) which grows in patches near the shoreline and forms a dense, continuous bed at greater depth further out in bay. 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.

As described above, the proposed revetment involved placement of fill that displaced an area of shoreline that would otherwise be part of this tidal flat. Although the revetment as constructed does exist in an area that would otherwise be tidal flat, it was installed in the location of previous fill immediately after that fill was lost by avulsion in the winter of 2015-2016. This previous fill had existed at the site for over a century. Because the proposed revetment was installed immediately after the historic fill was lost, there was not time for colonization of the newly exposed shoreline by the tidal flat ecosystem and therefore minimal impact to the aquatic habitat in the short term.

Although the proposed new revetment does not encroach further onto tidelands than the previous historic fill lost during the winter of 2015-2016, the revetment as hard armoring does fix the back of the bay, preventing retreat with sea level rise. As described above, Humboldt Bay is experiencing the greatest rate of relative sea level rise in the State due to active land subsidence. In addition, relative sea level rise rates are expected to accelerate in the latter half of this century and there is less certainty and a greater range in estimated water elevations by 2100 (predictions range from 2.0 to 5.3 feet of sea level rise for the Humboldt Bay area).

As sea levels rise, the tidal range of Humboldt Bay will shift up in elevation, moving landward. The proposed revetment will prevent migration of the intertidal habitat landward in the project area, reducing the area of the intertidal zone and resulting in loss of valuable aquatic habitat. By reducing the tidal prism, the revetment will also impact eelgrass habitat by reducing potential accommodation space for eelgrass to retreat shoreward in response to sea level rise.

The City has not proposed any mitigation for the loss of intertidal habitat over the life of the revetment nor attempted to analyze the extent or timing of future impacts. As a result, the

Commission cannot find that feasible mitigation measures have been provided to minimize adverse environmental effects for an indefinite authorization period.

Therefore, to ensure mitigation of potential future impacts to aquatic intertidal habitat with sea level rise, **Special Condition 4** limits the authorization period of the new 600-foot-long revetment until the earlier of July 1, 2026, or until the time when the currently existing sewer main warranting armoring (1) is redeveloped, (2) is no longer present and/or (3) no longer requires armoring for such protection, whichever occurs first. This limits authorization of the revetment to the next decade when less than a foot of sea level rise is expected. Prior to the end of the authorization period, Special Condition 4 requires the permittee to apply for a new CDP or amendment to this CDP, to remove the shoreline armoring or to modify the terms of its authorization, including with respect to any necessary mitigation. If the permittee applies to extend the authorization, Special Condition 4 requires that the application included proposed mitigation for unavoidable coastal resource impacts associated with the retention of the structure beyond the initial authorization period.

Furthermore, to ensure that no addition fill of coastal waters occurs through settlement of the revetment and dislodgement of revetment materials, **Special Conditions 2** and **3** require monitoring and maintenance of the revetment including retrieval of any rocks that migrate out onto the tidal flat. Because rocks and pebble backfill has already migrated out onto the tidal flat from the proposed new and repaired revetment, **Special Condition 3** also requires initial maintenance work within six months of Commission action.

Thus the project as conditioned includes feasible mitigation measures to minimize adverse environmental effects of fill consistent with Coastal Act Section 30233.

Maintenance and Enhancement of Habitat Values
As discussed in the above findings, the Commission finds that the development, as conditioned, will maintain and enhance the biological productivity and functional capacity of the habitat, maintain and restore optimum populations of marine organisms, and protect human health consistent with Sections 30230, 30231, and 30233.

Consistency of Repair and Maintenance of Existing Portion of Revetment with Coastal Act Sections 30230 and 30231
Although the proposed repairs to the preexisting revetment do not include any fill in coastal waters, the repairs could nonetheless potentially affect the biological productivity and quality of coastal waters and must therefore also be found consistent with Coastal Act Sections 30230 and 30231. The 285-linear-feet of repair work only involved repairs to the crest of the existing revetment and the upper portion of the revetment face. As a result, all work could be performed from uplands and no construction equipment or materials were placed on the tidal flat. In addition, all excess materials were removed from the site immediately upon completion of construction. Therefore the proposed method of repair and maintenance, as conditioned, maintains the biological productivity and quality of coastal waters consistent with the requirements of Coastal Act Section 30230 and 30231.

H. VISUAL RESOURCES

Section 30251 of the Coastal Act states in applicable part:

> *The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality of visually degraded areas.*

The proposed new revetment has been sited and designed to protect views to and along the ocean, to minimize the alteration of landform, and to be visually compatible with the character of the surrounding area. The proposed revetment's crest at 10 to 13.2 feet in elevation (NAVD 88) is only one to two feet higher than inland surface elevations, low enough to protect views of Humboldt Bay from the adjacent Coastal Trail and other public vantage points. The proposed new segment of revetment extends along a smooth, concave arc connecting the existing revetment to the north to the rocky point to the south in the same alignment as the preexisting shoreline prior to the major erosion that occurred in the winter of 2015-2016. To ensure visual compatibility, the applicant's consultant has engineered the proposed new revetment to approximate the size, bulk, and outward appearance of the adjacent revetment to the north, so that the two segments of armoring appear as one large revetment. Although the filled former tidelands directly behind the proposed revetment are largely undeveloped except for the sewer main and Coastal Trail, the site is located within urbanized Eureka contiguous with existing developments including the Chevron Eureka Marine Terminal to the north, the City's Elk River Wastewater Treatment Plant to the south, and a trailer park and roofing company to the east. The project is not located within a designated highly scenic area.

If not properly maintained, the visual quality of the revetment will degrade overtime, as rocks dislodged by coastal erosion migrate out onto the tidal flat. **Special Conditions 2 and 3**, which require monitoring and maintenance of the revetment, ensure that the City retrieves rocks that migrate out onto the tidal flat and restacks them within the footprint of the revetment. In addition, **Special Condition 4** requires the City to remove the revetment by 2026 or earlier, or apply for an amendment with an alternatives analysis exploring alternatives that reduce impacts to public views, shoreline processes, and other coastal resources.

Prior to the proposed revetment construction and repair, a scattering of fill material existed along the shoreline in the project area, including pebbles, rocks, and concrete and asphalt rubble of various sizes (See Exhibit X, pgs. X). During project construction, debris exposed along the erosional scarp of the unarmored shoreline was buried behind the proposed new revetment. However, rocks and other armoring and fill debris that had migrated onto the tidal flat below the existing revetment were left in place, as well as debris bayward of the new revetment's footprint. This scattered armoring and fill debris degrades the scenic quality of the shoreline in the area and, due to the Coastal Trail and Truesdale Vista Point/ Trailhead, this degradation is highly visible to the public.

Furthermore, Commission staff recently visited the project site in July and August 2017, over a year and a half after project construction, and observed a number of maintenance issues with the revetment that are impacting the visual quality of the area. In addition to scattered fill and armoring debris on the tidal flat, Commission staff observed small river rocks and other backfill materials exposed at the toe of the revetment and geotextile fabric exposed both above the crest of the revetment and below the revetment toe.

To ensure that the aforementioned maintained issues are promptly addressed to protect the visual quality of the area, **Special Condition 4** requires that the permittee perform initial revetment maintenance within six months of Commission action on CDP 1-16-0357, including (1) manually removing rock, pebble, and other debris that has become dislodged from the new and repaired revetments from the adjacent tidal flat during low tide; (2) addressing geotextile fabric and any other subsurface elements of the new or existing revetment that have become exposed; (3) addressing washout of smaller rocks and loose sandy backfill and undercutting of the adjacent shoreline; and (4) rectifying slumping of repaired portions of the existing revetment.

The Commission therefore finds that the project, as conditioned, will be consistent with Section 30251 of the Coastal Act as the project protects views to or along the coast, minimizes major landform alteration, and is compatible with the character of the surrounding area.

I. ARCHAEOLOGICAL RESOURCES

Section 30244 of the Coastal Act states:

> *Where development would adversely impact archeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.*

The project area lies within the traditional territory of the Wiki division of the Wiyot tribe. At the time that Euro-Americans first made contact in this region, the Wiyot lived almost exclusively in villages along the protected shores of Humboldt Bay and near the mouths of the Eel and Mad Rivers. Today, representatives of the Wiyot Tribe are the Table Bluff Reservation Wiyot Tribe, the Blue Lake Rancheria, and the Bear River Band of the Rohnerville Rancheria.

Given ethnographic evidence of Wiyot habitations along Humboldt Bay and the project's location along the Eureka shoreline, it is likely cultural resources are present in the project area. The Tribal Historical Preservation Officers (THPOs) of the Wiyot Tribe, the Bear River Band of Rohnerville Rancheria, and the Blue Lake Rancheria were not consulted before the emergency work was performed but have since been consulted by Commission staff. According to the THPOs, the project is located in an archaeologically sensitive area, and the revetment will help protect potential buried archaeological resources from coastal erosion.

The proposed revetment construction and repair work has already been performed, and no incidental discovery of archaeological resources during project construction was reported. The CDP also authorizes limited future maintenance of the revetment through **Special Condition 4**,

and ground disturbing maintenance work within the uplands adjoin the revetment has the potential to impact archaeological resources. The THPOs have been notified of the maintenance provision of the permit, and have requested that they be consulted prior to any future ground disturbing activities and given the chance to have a cultural monitor present on site. To ensure protection of any archaeological resources that may be discovered at the site during future revetment maintenance work, Special Condition 4 requires that, at least 30 days prior to commencement of any ground disturbing maintenance event, the City shall notify the THPOs from the Wiyot Tribe, the Bear River Band of Rohnerville Rancheria, and the Blue Lake Rancheria and arrange for tribal representative(s) to be present to observe ground-disturbing activities if deemed necessary by the THPOs. A cultural resources monitor approved by the Wiyot Tribe, the Bear River Band of Rohnerville Rancheria, and the Blue Lake Rancheria shall be present to oversee all ground disturbing maintenance activities unless evidence has been submitted for the review and approval of the Executive Director that the THPOs of these three entities have agreed that a cultural resources monitor need not be present.

Therefore, the Commission finds that the proposed project, as conditioned, includes reasonable mitigation measures consistent with the requirements of Coastal Act section 30244.

J. PUBLIC ACCESS

Coastal Act Section 30604(c) requires that every coastal development permit issued for any development between the nearest public road and the sea "shall include a specific finding that the development is in conformity with the public access and public recreation policies of [Coastal Act] Chapter 3." The proposed project is located seaward of the first through public road (State Highway 101). The following Coastal Act Sections specifically protect public access and recreation:

Coastal Act Section 30210 states:

> *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

Coastal Act Section 30211 states:

> *Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.*

Section 30213 of the Coastal Act states, in part:

> *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred…*

Coastal Act Section 30221 states:

> *Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.*

These overlapping policies protect and promote access to and along the shoreline and public recreational opportunities, particularly free and low-cost coastal access and recreational facilities. The City of Eureka is located on the inner shoreline of Humboldt Bay, buffered from the Pacific Ocean by the bay and the Samoa Peninsula. The California Coastal Trail is the primary recreational amenity along the southern Eureka waterfront and the way most people access this stretch of bay front. The proposed new and repaired revetments protect a portion of the California Coastal Trail and related coastal access support facilities including picnic tables and a trailhead parking lot.

The proposed project would add new armoring and extend the life of existing armoring. This shoreline armoring occupies tidal flat that would otherwise be unencumbered and fixes the back of the bay. Fixing the back of the bay with revetments can result in the loss of sediment in the larger sand supply system. Beach sand material comes to the shoreline from inland areas, carried by rivers and streams; from offshore deposits, carried by waves; and from coastal dunes and bluffs feeding the beach. When the shoreline is protected by a shoreline protective device, the natural exchange of sand material from the shoreline to beaches can be interrupted, and if the shoreline is eroding, may result in a measurable loss of material that would normally become a part of beaches, negatively impacting the sediment budget along adjacent shorelines.

However, at the project site, sediment supply is dominated by material moving out of the Elk River channel rather than from shoreline erosion. In addition, the proposed new revetment protects a stretch of bay front that was previously filled with rocks, concrete, asphalt rubble, other man-made debris, and earthen materials. This historic fill already inhibits natural shoreline processes in the area. Furthermore, when erosion of the shoreline does occur, such as during the winter storm events of late 2015, the material that erodes is historic fill rather than natural shoreline, and the erosion results in rocks and manmade debris being released onto the tidal flat and into the bay. The public access and recreation impacts from any sand supply loss stemming from this approval will also be minimal due to the fact that the project is located on the eastern shoreline of Humboldt Bay where there is no nearby sandy beach recreation. Undeveloped portions of shoreline in the project vicinity are largely comprised of mudflat, willow thickets, dune mat, freshwater marshes, salt marshes, and tidal sloughs. For all the reasons described above, the new and repaired revetments will not have a significant adverse impact on sediment supply to public beaches.

The existing revetment that is the subject of the proposed repairs has settled since its construction under an emergency waiver a decade ago and revetment rocks and pebble backfill have migrated onto the tidal flat below the revetment (Exhibit X). In addition, revetment rocks and pebble backfill has already migrated onto the tidal flat from the proposed new revetment constructed during January 2016 (Exhibit X). This revetment migration onto the tidal flat unnecessarily blocks public access and discourages use of the flat. Thus **Special Conditions 2 and 3** require ongoing monitoring and maintenance, including removal of any debris, rock, or material that

becomes dislodged from the new or repaired revetments. Furthermore, pursuant to **Special Condition 4**, the new revetment is only being authorized for a limited timeframe, with a requirement that impacts to public access are reassessed by 2026 or earlier.

Therefore, for all of the reasons set forth above, the Commission finds that the project as proposed is consistent with the requirements of Coastal Act Sections 30210, 30211, 30212, and 30214.

K. VIOLATION

Violations of the Coastal Act exist on the subject property including, but not limited to, installation of additional RSP beyond what was temporarily authorized under Emergency Permit G-1-16-0003 ("Emergency Permit"), issued on January 8, 2016. The Emergency Permit authorized the placement of approximately 2,000 tons of rock slope protection (RSP) along a 10-foot-wide by 300-foot-long stretch of shoreline in response to severe erosion of the shoreline resulting from high tides coupled with storm activity during the winter of 2015-2016. The revetment ultimately constructed by the City measures 15-feet-wide by 600-feet-long, five feet wider and twice as long as that which had been authorized by the Emergency Permit. In addition, the City repaired approximately 285 linear feet of existing revetment to the north of the revetment subject to the Emergency Permit. The shoreline behind the revetment had been eroded in a number of locations from loose, sandy shoreline material washing out through voids in the rock facing. The City, without the required authorization, filled these voids by placing geotextile fabric and backfilling with rock. The existing revetment, constructed in January of 2006, was exempt from the need for a CDP under Coastal Act Section 30600(e)(1). However, the proposed repairs to the existing revetment require coastal development permit approval.

Although development has taken place prior to submission of this permit application, consideration of this application by the Commission has been based solely upon the Chapter 3 policies of the Coastal Act. Commission review and action on this permit does not constitute a waiver of any legal action with regard to the alleged violations, nor does it constitute an implied statement of the Commission's position regarding the legality of development, other than the development addressed herein, undertaken on the subject site without a coastal permit. In fact, approval of this permit is possible only because of the conditions included herein and failure to comply with these conditions would also constitute a violation of this permit and of the Coastal Act. Accordingly, the applicant remains subject to enforcement action just as it was prior to this permit approval for engaging in unpermitted development, unless and until the conditions of approval included in this permit are satisfied. As acknowledged by **Special Condition 1,** failure to comply with the terms and conditions of this permit may result in the institution of enforcement action under the provisions of Chapter 9 of the Coastal Act.

L. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The City of Eureka, acting as lead agency for the project for CEQA purposes, found the project statutorily exempt from CEQA pursuant to Section 15269 of the CEQA Guidelines (Emergency Permits). The notice of exemption was filed with the County of Humboldt County Clerk on April 12, 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. The findings address and respond to all public comments regarding potential significant adverse environmental effects of the project on coastal resources that were received prior to preparation of the staff report. 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. 1-16-0357.

File for Emergency Permit G-1-16-0003.

City of Eureka (2010). *CEQA Initial Study Elk River Access/ Iksori Trail Project.*

Laird, A., Trinity Associates (2016). *City of Eureka Sea Level Rise Assets Vulnerability and Risk Assessment, Appendix*. Prepared for the City of Eureka.

Laird, A. of Trinity Associates (2013). *Humboldt Bay shoreline inventory, mapping, and sea level rise vulnerability assessment.* Prepared for the State Coastal Conservancy.

Laird, A. of Trinity Associates (2015, February). *Sea Level Rise Adaptation Planning Project: Phase II Report*.

Northern Hydrology & Engineering. (2015, April). Humboldt Bay: Sea level rise, hydrodynamic modeling, and inundation vulnerability mapping – Final report. Prepared for the State Coastal Conservancy and Coastal Ecosystems Institute of Northern California.

Roscoe & Associates. (2010, July). *A Cultural Resources Investigation of the Elk River Trail Access Project Located in Humboldt County, California.*

SHN Consulting Engineers & Geologists, Inc. (January 2007). *Biological Assessment for the Elk River Wildlife Trail Improvement Project*. Prepared for the City of Eureka.

State of California Department of Transportation Engineering Service Center Office of Structural Foundations Transportation Laboratory (2000, October). *California Bank and Shore Rock Slope Protection Design, Practitioner's Guide and Field Evaluations of Riprap Methods*, Third Edition – Internet. Report No. FHWA-CA-TL-95-10.

US Army Corps of Engineers. (1995, June 30). *Design of Coastal Revetments, Seawalls, and Bulkheads*. Engineer Manual 1110-2-1614.

US Department of Transportation Federal Highway Administration (2009, September). *Bridge Scour and Stream Instability Countermeasures – Experience, Selection, and Design Guidelines*, Volume 2, 3rd Edition. Hydraulic Engineering Circular No. 23 Publication No. FHWA-NHI-09-112.

Websites:

City of Arcata's GIS Parcel Finder Application: https://gis01.cityofarcata.org/web/COA_Parcel_finder/

City of Eureka, California Geographic Information System Community Development Viewer: http://gis.ci.eureka.ca.gov/flexviewers/ComDevViewer/

National Audubon Society. "Protecting Humboldt Bay." http://ca.audubon.org/conservation/conservation/seas-shores/humboldt-bay.

National Oceanic and Atmospheric Administration. (2011). Datums for 9418767, North Spit CA. https://tidesandcurrents.noaa.gov/benchmarks/9418767.html