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Click here to go to original staff report

W21a

Prepared July 7, 2015 for July 8, 2015 Hearing

To: Commissioners and Interested Persons

From: Susan Craig, District Manager
Ryan Moroney, Coastal Planner

Subject: STAFF REPORT ADDENDUM for W21a
CDP Number 3-15-0144 (San Lorenzo River Interim Management Program)

The purpose of this addendum is to respond to comments received on Monday, July 6, 2015 by a member of the public, David Kossack (see attached letter) expressing concerns related to the project. Pertinent comments are summarized below along with staff's response. Additionally, the City has provided its own response, which is also attached. This addendum also adds an additional finding and condition to the staff report regarding liability for costs and attorneys' fees, with text in underline format indicating text to be added.

Comment 1: The City has not adequately demonstrated the need for the project, and has not adequately identified alternatives to the proposed project.

Response: *As stated in the staff report, the Coastal Act authorizes flood protection projects in riverine systems in order to protect existing development only where the project is the least environmentally damaging "feasible" alternative and all feasible mitigation measures are implemented. In this case, the City has documented flooding impacts to existing public infrastructure and private property as a result of heightened elevation of the seasonal lagoon/estuary that forms on the San Lorenzo River typically in the summer/fall season. (See, specifically,* ***Exhibits 4*** *and* ***6*** *to the staff report). The comment identifies improvements to the City's storm drain system and levee drainage systems as an alternative means of addressing flooding impacts. The City did not pursue these options on the basis that they were not economically feasible. (See Attachment 2.) Rather, over the course of the past several months, the City has been working with Federal and State resource agencies, including Commission staff, in an attempt to develop a preferred management program for the River that addresses both the need for protection of natural resources and the need to protect existing development from these flooding impacts. The proposed "head-driven" culvert management option is the culmination of those efforts. The overall intent of the project is to provide time to finalize, fund and implement the culvert, and then test its effectiveness as the environmentally preferred long-term strategy, while in the meantime allowing mechanical breaching of the lagoon system, only as a last resort as necessary to avoid flooding impacts, until the culvert is in place.*

*Moreover, the project is conditioned to require that the culvert operation maintain the maximum water surface elevation possible consistent with flood protection (**Special Condition 2.c**) and that the City monitor flooding impacts at various water surface elevations of the lagoon. The City is also required to provide a report at the end of the project period to assess the overall effectiveness of the culvert, including at different water surface elevations, to determine the maximum water surface elevations that can be maintained without significant flooding damage to private property and public infrastructure (**Special Condition 2.f**).*

Comment 2: The City must identify and comply with all other agency permits/approvals before CDP Application #3-15-0144 is approved rather than after this project is implemented.

***Response:** Because of different permitting timelines for each agency, the City has not yet received all required permit approvals, but it is expected to over the course of the next two to three months. In any event, **Special Condition 4** requires the City to comply with permitting requirements of all other agencies prior to implementation of the project, including amending the CDP as necessary to provide for additional measures emanating from such approvals.*

Comment 3: The staff report has not discussed the relation or impacts of the City's paddle boarding activities in the lower lagoon. These impacts are clearly connected to the management of the lagoon (i.e., the paddle board activities are specifically tied to the sand bar/berm being closed, they affect the same sensitive coastal resources and they will likely have their own Water Surface Elevation management requests).

***Response:** Commission staff is aware of the City's proposed Pilot Paddling Program for the lower San Lorenzo River Lagoon. However, the City has not applied for a Coastal Development Permit for that program, nor has staff determined whether such a program would require a CDP. This project is not before the Commission at this time, and if it does come before the Commission, its consistency with the Coastal Act will be assessed at that time.*

Comment 4: The IS/MND as circulated by the City of Santa Cruz was not included in the Coastal Commission's staff report. I have attached my comments to that CEQA document and ask that they be included in my comments for the CDP.

***Response:** The IS/MND was not included as an attachment to the staff report but was relied on in reaching the staff recommendation and is available in the substantive file. Moreover, as discussed in the staff report, the Commission's review and analysis of land use proposals has been certified by the Secretary of Resources as being the functional equivalent of environmental review under CEQA. In this case, the coastal development permit findings discuss the relevant coastal resource issues raised by the proposal, and the permit conditions identify appropriate modifications to avoid, lessen, and mitigate any potential for adverse impacts to said resources.*

Finally, staff adds the following finding and special condition to the staff recommendation:

1. Add the following as subsection G just prior to the CEQA finding on page 25:

   <u>G. Liability for Costs and Attorneys' Fees</u>

Coastal Act Section 30620(c)(1) authorizes the Commission to require applicants to reimburse the Commission for expenses incurred in processing CDP applications. Thus, the Commission is authorized to require reimbursement for expenses incurred in defending its action on the pending CDP application in the event that the Commission's action is challenged by a party other than the Applicant. Therefore, consistent with Section 30620(c), the Commission imposes ***Special Condition 6*** *requiring reimbursement for any costs and attorneys' fees that the Commission incurs in connection with the defense of any action brought by a party other than the Applicant challenging the approval or issuance of this permit.*

2. Add the following as **Special Condition 6** on page 10:

6. *Liability for Costs and Attorneys' Fees. The Permittee shall reimburse the Coastal Commission in full for all Coastal Commission costs and attorneys' fees (including but not limited to such costs/fees that are: (1) charged by the Office of the Attorney General; and (2) required by a court) that the Coastal Commission incurs in connection with the defense of any action brought by a party other than the Permittee against the Coastal Commission, its officers, employees, agents, successors and assigns challenging the approval or issuance of this permit. The Permittee shall reimburse the Coastal Commission within 60 days of being informed by the Executive Director of the amount of such costs/fees. The Coastal Commission retains complete authority to conduct and direct the defense of any such action against the Coastal Commission.*

David S. Kossack, Ph.D.
P. O. Box 268
Davenport, CA 95017

Sunday, July 5, 2015

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CALIFORNIA COASTAL COMMISSION
CENTRAL COAST DISTRICT OFFICE
725 FRONT STREET, SUITE 300
SANTA CRUZ, CA 95060

Re: Application # 3-15-0144 (San Lorenzo River Interim Management Program, City of Santa Cruz)

Commissioners:

Thank you for the opportunity to comment on Application # 3-15-0144 (San Lorenzo River Interim Management Program, City of Santa Cruz). The illegal breaching of the berm at the mouth of the San Lorenzo River has been going on for decades. The manipulations of the berm and lagoon represents a cumulative impact to fish, bird and wildlife habitats of the San Lorenzo River and its watershed. I request that this item be removed from the Consent Calendar and be provided the public hearing that it deserves. I have several comments:

- The City makes a statement about impacts to City infrastructure from sustained high waters on the San Lorenzo but fails to identify what time period their impact costs cover. Since flooding issues related to the WSE in the San Lorenzo River Lagoon are predictable and foreseeable I question whether this maintenance effort is above any background level of Public Work's budgeting (i.e., it is not an 'emergency'); it may simply be the cost of doing business in a City located next to both a river and the ocean. Clearly the San Lorenzo River was there when these structures were built, and so was the ocean, and to say they "didn't know" is somewhat disingenuous, and to say that they planned to address these issue later is "deferred mitigation", illegal under CEQA.

  I agree with CDFW when they say, "CDFW recommends the MND be revised to evaluate the feasibility and effectiveness of improvements to the City's storm drain system and levee drainage systems for the purpose of maintaining a higher WSE and reducing impacts associated with a reduced lagoon volume on special-status species within the lagoon." Footnote 6 on page 20 of this staff report expands upon this concern noting the arbitrary and capricious nature of the City's WSE targets. The City's obligation of 'due diligence' would be better served by expanding upon specific, clearly "feasible" flood-proofing (e.g., new pumps, resealing below-grade, and above-grade seawall) such as that apparently implemented by the Seaside Co.

  In the absence of documentation specifically evaluating the feasibility and effectiveness of improvements to the City's storm drain system, levee drainage systems and road beds to address flooding issues the MND fails to meet the criteria of the Coastal Act:

  1) feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment have not even been identified or acknowledged by the City; nor
  2) have any, yet identified, feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment; and
  3) components within this project where the primary function is claimed to improve of fish and wildlife habitat are wanting; there has been no discussion on mitigations that could improve the sensitive coastal resources of the lower San Lorenzo River lagoon such as wetland restorations.

  Therefore Coastal Development Permit Number 3-15-0144 does not comply with either the Coastal Act nor the California Environmental Quality Act (CEQA) and as such should not be approved.

- The City must identify and comply with the conditions of all permits and approvals of other agencies before CDP Application #: 3-15-0144 is approved rather than after this project is implemented.

- This document has not discussed the relation or impacts of the City's paddle boarding activities in the lower lagoon (SCz City Council, June 23, Agenda Item #32: Pilot Paddling Program). These impacts are clearly connected to the management of the lagoon: the paddle board activities are specifically tied to the sand bar/berm being closed, they affect the same sensitive coastal resources and they will likely have their own WSE management requests (see attached comments to this item dated June 21, 2015).

- The IS/MND as circulated by the City of Santa Cruz was not included in the Coastal Commission's staff report. I have attached my comments to that CEQA document and ask that they be included in my comments for the CDP.

The Coastal Commission appears to be eager to apply a "Chamber of Commerce" view of public access, measured in terms of how many feet (i.e., recreational beach visitors) can stand on a square foot of sand at one time: "Other issues associated with closed lagoon conditions include public access and safety for Santa Cruz Main Beach, an area visited by over three million people annually." However the Commission seem to discount the need for the public's "access" to sensitive coastal resources, including the watersheds that they depend upon, 150 years from now even if that means not standing on top of these sensitive coastal resources between now and then… This has left the possibility of allowing the berm and lagoon to function as they will, restoring some semblance of natural hydrology and geomorphology, at a metaphoric "low tide". I ask that the Commission reject CDP Application # 3-15-0144 (San Lorenzo River Interim Management Program, City of Santa Cruz).

Thank you

David Kossack

David S. Kossack, Ph.D.
P. O. Box 268
Davenport, CA 95017

Thursday, April 30, 2015

dkossack@cruzio.com
831.419.8307

City of Santa Cruz
809 Center Street, Room 10
Santa Cruz, CA 95060

Re: San Lorenzo River Lagoon Interim Management Program, Mitigated Negative Declaration and Initial Study

City Council:

Thank you for the opportunity to comment on the San Lorenzo River Lagoon Interim Management Program (IMP), Mitigated Negative Declaration and Initial Study. It is good to see that the City of Santa Cruz is responding to the ongoing anthropogenic breaching of the berm at the mouth of the San Lorenzo River and its impact on fish, birds and wildlife. I do have several comments:

- This document claims several facilities are impacted by flooding as a result of "closed lagoon conditions". Among these events the City cites on page 2: the U.S. Army Corps San Lorenzo River Flood Control Project levee system and drainage facilities; the bikeway along San Lorenzo River and "The historic Del Mar Theater in downtown Santa Cruz experienced basement flooding in 2014 during a prolonged lagoon closure period." It seems that the Army Corps should have seen this coming; the bikeway(s) were intended to be part of the river/riparian process rather than triggers of growth inducing and cumulative impacts; and the document's reference for the 2014 Del Mar flooding (SOURCE V.3b) is unavailable as part of this document to determine whether the suggested flooding event was actually a result of "closed lagoon conditions" or something else was going on… (e.g., has the Del Mar flooded before?).

- Objective 2, on page 5, states: "Establish a perched lagoon for a sustained period to provide habitat for aquatic species concurrent with acceptable species habitat." but the document fails to provide what lagoon conditions are necessary to provide this/these habitat(s) or a length of time… likely all summer and fall until storms naturally breach the berm. This document needs to provide that information, and circulate that information for public comment as part of the IMP before any approval can be assessed.

- Objective 3 states: "Maintain a perched lagoon at elevation 5.0 NGVD29 to prevent flooding of surrounding public and private properties." It is my understanding that 5.0 NGVD29 is the level the lagoon begins to provide acceptable habitat. This target height for anthropogenic breaching simply frustrates habitat protection and restoration. This document needs to provide alternatives that do not compromise Objective 2.

- Objective 4 appears to be an attempt to institutionalize 'emergency actions' as standard operational procedures (SOP).

- The IMP does not discuss the anadromous Green sturgeon, a listed species under the ESA. These fish are found in Elkhorn Slough and were likely found in the San Lorenzo River under historic conditions (e.g., as described in 9. Background, page 2). The IMP need to identify acceptable species habitat for the protection and restoration of these fish in addition to other listed species presented.

- Neither the Temporary Outlet Channel nor the Head Driven Culvert are intended or capable of sustaining the 5.0 feet NGVD necessary for acceptable species habitat (Proposed Avoidance and Minimization Measures, page 11). In fact under the Outlet Channel 5.0 NGVD triggers breach events while under the Head Driven Culvert the stand pipe(s) are at 3.0, it's likely that the lagoon will never reach 5.0 under this scenario.

- Page 9: There needs to be identified the mechanism of determining that "…the project is resulting in unintended or unanticipated adverse impacts to listed species or their habitats", preferably determining any adverse impacts to listed species or their habitats, including Green sturgeon.

- Under II. Environmental Setting, the "potential area of disturbance" would not simply be 0.15 acres but rather the entire reach from the "river mouth to Water Street." both in terms of the change in lagoon surface area when the water level is changed from >= 5.0 feet to 3.0 feet as well as the change in habitat quality provided by the water column.

- In its present form this document is simply a stepping stone from an Interim to a permeant Management Program, really just a fragmentation of the project into smaller, easier to approve pieces. This project clearly has growth inducing and cumulative impacts to biological resources of a magnitude that demands a full EIR.

I believe that it is safe to say that the San Lorenzo River was there when the Seaside Co. built the Boardwalk. This is likely true for all the structures that the City claims are impacted, real and imagined, by the San Lorenzo River's pre-existing natural "closed lagoon conditions". It is the Seaside Company's, and the City of Santa Cruz's, responsibility to accommodate the conditions into which they have inserted themselves whether this accommodation is as simple as sealing and waterproofing their "basements" or moving their structures out of the floodplain. It is their responsibility and no one else should have to deal with it.

There is a throw away line that is too often use which brushes off the San Lorenzo River as "a working river"; unfortunately the San Lorenzo River is not working in any sense of the word. The current state of the River just represents the abysmal failure of the City of Santa Cruz as well as local, state and federal agencies, to protect the public trust resources of this watershed, top to bottom.

Neither the Seaside Company in particular nor the City in general should be permitted to further compromise the hydrology and geomorphology of the San Lorenzo River, or the fish, birds and wildlife that depend upon these processes, through the continued anthropogenic manipulation of the "summer sandbar" and associated lagoon whether it is through this 'Interim Management Program' or rouge breaching by any party.

Thank you for this opportunity to comment on the San Lorenzo River Lagoon Interim Management Program, Mitigated Negative Declaration and Initial Study.

Sincerely

David Kossack

David S. Kossack, Ph. D.
P. O. Box 268
Davenport, CA 95017

Sunday, June 21, 2015

dkossack@cruzio.com
831.419.8307

Mayor Don Lane and City Council
City of Santa Cruz
809 Center Street, Room 10
Santa Cruz, CA 95060

Re: June 23, Agenda Item #32: Pilot Paddling Program Advisory Group Findings and Recommendations (CM)

Mayor Lane and Council:

Thank you for this opportunity to comment on the Pilot Paddling Program Advisory Group Findings and Recommendations. I do not support implementing pilot paddling program; my concerns about the intent and value of opening up the lower San Lorenzo River to recreational boating/watercraft include the following:

- The San Lorenzo River Lagoon is important habitat for birds, fish (including listed coho, steelhead, green sturgeon and tidewater gobies) and wildlife. There are a number of actions affecting this part of the San Lorenzo River specifically driven by these species including the City's proposed Lagoon Interim Management Program (IMP). The IMP is supposed to sustain lagoon habitat for salmonid grow out and prevent the illegal breaching of the berm at the mouth of the San Lorenzo River. This is the also the location that Pilot Paddling Program targets for its in-river activities. The Paddle Program goes so far to say that the Paddling events will only occur 'only during closed lagoon conditions.'

  Clearly there is a nexus between the lagoon IMP and the Pilot Paddling Program but the Findings and Recommendations proposes to implement the Pilot Paddle Program without a CEQA document; this represents project fragmentation. There are also growth inducing activities: the intent is for more Paddling, and there are cumulative impacts on fish, birds and public resources including the lagoon IMP habitat management; River Parkway Levee modification impacts (e.g., lighting) to fish and birds (e.g., agenda item 23. San Lorenzo River Parkway Levee Improvements (c401416) – Authorization to Reject Bids and Re-Advertise (PW)); the City's commitment to a salmonid HCP; and the present paddling program. These projects need to be addressed as a single project.

- Why aren't paddlers paddling at the SCz Harbor rather than harassing San Lorenzo River fish, birds and wildlife.

- The Program needs to define a minimum Paddling depth/River height before paddling is considered. It also needs to set a max. number of paddlers at a time on the SLR; 50 at a time is clearly too much. To say, "Such a system necessitates employing additional staff or reassigning existing staff from other programs." suggests staff is reluctant to take responsibility for the impacts to the San Lorenzo River from paddling. The City needs to post a bond to insure that funding for Biological Monitoring and staff time is committed for the entire period of any Pilot Program.

- Paddler Education: Need to be signup for paddling and a real time Paddler Education program at the lower San Lorenzo River before a paddler can participate. This would promote fish and wildlife awareness, community contact (know your user group) and paddling safety. This is reasonable because the Plan claims that this is Information Collection.

- Any Paddling Program must provide a fish monitoring component, in addition to birds, that includes habitat use, feeding patterns and avoidance.

- The City currently does not allow boating in the San Lorenzo River. The Pilot Paddling Program Advisory Group Findings and Recommendations does not include the existing ordinance which restricts paddler access. The present Program/agenda item needs to include a copy of the current Resolution and its supporting documents (i.e., the Record) that the City Council previously considered in banning boating/watercraft from the San Lorenzo River.

- Any Paddling Pilot Program must be defined such that if biological and paddler monitoring funding and/or Staff Time cannot be allocated then the Pilot Program should be abandoned since no Informational Collection will be occurring.

Thank you for this opportunity to comment on the Pilot Paddling Program

David Kossack

CITY OF SANTA CRUZ

OFFICE OF THE CITY MANAGER

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July 7, 2015

Mr. Ryan Moroney
Coastal Planner
California Coastal Commission
Central Coast District Office
725 Front Street, Suite 300
Santa Cruz, CA 95060

RE: Additional Information Regarding Permit 3-15-0144 (San Lorenzo River Interim Management Program)

Dear Mr. Moroney:

The City of Santa Cruz (City) is in receipt of the letter submitted by Mr. David Kossack regarding Permit 3-15-0144. The City provides the following responses for the items raised in Mr. Kossack's letter. Thank you for the opportunity to respond and provide clarification.

Public and Private Infrastructure Impacts. The letter maintains that the impacts to both public and private infrastructure can be predicted and costs related to flooding are part of maintaining properties in coastal locations. As stated in the project materials, City infrastructure and private properties experience flooding-related impacts when lagoon elevations increase above 5.0 NGVD. These include flooding of basements, backyards, bike trails, electrical systems, road surfacing, and pump stations. These impacts occur annually during extended lagoon closures usually in July–September. The San Lorenzo River Interim Management Program (IMP) provides habitat for species and maintains conditions in the lagoon that prevent flooding of public and private infrastructure.

Analysis of Alternatives. The letter suggests that alternatives were not considered for the IMP. The process conducted by the City for the IMP included four meetings with regulatory and natural resource agencies over a course of four months to develop and finalize the proposed

actions for the IMP. Two actions were agreed to for the IMP and eight engineered alternatives were then analyzed at a subsequent meeting. A permitting and engineering feasibility analysis was conducted on the eight alternatives and the two proposed designs were moved forward to permitting and environmental review.

Improvements to Existing Infrastructure. The suggestion that the City consider improvements to storm drain and levee drainage systems is also presented in the letter. The San Lorenzo River Flood Control Project is a FEMA-certified levee system first constructed in 1957 and subsequently upgraded in 2000. The levee system is engineered to protect surrounding properties from high river flows during river flood events. The system is not designed to prevent groundwater infiltration to drainage systems or properties. The City has determined that changes to the existing levee drainage system are not consistent with the flood protection provided by the levee system. Improvements thus would be the responsibility entirely of the City and are estimated in the tens of millions of dollars. The City is unable to support this level of improvements.

Impacts to Species. It should be noted that the biological assessment conducted for the IMP found that keeping the lagoon at the proposed 5.0 NGVD would be beneficial compared to existing conditions where lagoon elevations fluctuate as low as 1.0 NGVD during unauthorized breach events. Impacts to special-status species were not found in the analysis included in the biological assessment for the IMP. The biological assessment found that the proposed IMP would likely be beneficial to the tidewater goby due to more stable water surface elevations.

CEQA-Related Comments.

1. Mitigation Measures: The comment regarding "deferred mitigation" is not correct. Mitigation measures are required for identified significant impacts of a proposed project. Section 15126.4 of the State CEQA Guidelines indicates that the formulation of mitigation measures should not be deferred to a future time. The proposed project is managing lagoon water levels to minimize flood impacts upon public and private properties. The Initial Study identifies mitigation measures for the two identified significant impacts. There has been no "deferral" of mitigation for the proposed action, and both measures are feasible, and thus the statement that feasible mitigation measures have not been identified is incorrect. The examination of alternatives to the project, e.g., storm drain improvements, is not required in the preparation of an Initial Study/MND. Mitigation measures are required for significant adverse impacts resulting from a project, and are not required to "improve" or restore conditions.

2. Relation to Coastal Act: The MND is prepared pursuant to CEQA. The Coastal Commission's staff report will report on whether the project is consistent with applicable Coastal Act policies. CEQA and the Coastal Act are two different laws. The Coastal Commission certified the City's Local Coastal Plan (LCP) in accordance with the Coastal Act requirements. Consistency with the City's LCP policies is provided in Section 10 of the Initial Study.

3. Paddle Boarding Activities: The "pilot" paddling program has recently come under review by the City and a pilot program was presented to the City Council in June after the IMP Initial Study/MND had been prepared. The City is reviewing the pilot program and has not yet made a CEQA determination. The proposed IMP has no relationship to the paddling program. The IMP looks at managing water levels at specified levels as explained in the project documents and summarized in the Initial Study, and the impacts of the IMP have been fully analyzed in the Initial Study. The pilot paddling program would operate under specified, limited times and conditions in large part to gather more information in order to review a longer-term program. The pilot program would be overseen by a professional biologist to make sure that all appropriate management practices are set in place to avoid potential biological impacts. The pilot paddling program will not control water levels to maintain a lagoon level at any specified level for these pilot program paddling activities.

This concludes the City's response to Mr. Kossack's letter. Please contact me should you have any questions.

Sincerely,

Scott Collins
Assistant to the City Manager

W21a

Moroney, Ryan@Coastal

From: Scott Collins <SCollins@cityofsantacruz.com>
Sent: Wednesday, June 24, 2015 11:15 AM
To: Moroney, Ryan@Coastal
Subject: RE: San Lorenzo River Interim Management Plan

Hi Ryan,

The City is in agreement with the staff recommendation and conditions.

RECEIVED
JUN 24 2015
CALIFORNIA
COASTAL COMMISSION
CENTRAL COAST AREA

Thanks,
Scott

From: Moroney, Ryan@Coastal [mailto:Ryan.Moroney@coastal.ca.gov]
Sent: Wednesday, June 24, 2015 10:25 AM
To: Scott Collins
Subject: San Lorenzo River Interim Management Plan

Hi Scott:

This email is intended to confirm with you our understanding that the City is in agreement with the staff recommendation for the San Lorenzo River Interim Management Plan (CDP # 3-15-0144), and is requesting that the item be moved to the consent calendar. If so, the item will be moved to consent calendar that morning (Wednesday, July 8, 2015) prior to the Commission acting on it (see explanation/procedure below). Please confirm.

***

Items appearing in this section of the agenda may be moved to the Consent Calendar for this area by the Executive Director when, prior to taking up the Consent Calendar, staff and the applicant are in agreement on the staff recommendation. If an item is moved to the Consent Calendar it will be processed in the same manner as other Consent Calendar items (See Agenda Categories) except that if that item is subsequently removed from the Consent Calendar by a vote of three or more commissioners, the item will be acted upon at the meeting in the order in which it originally appears on this Meeting Notice and in the manner Coastal Permit Applications are processed. The purpose of this procedural change is to expedite the Commission's coastal development permit process.

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W21a

Filed:	5/19/2015
Action Deadline:	11/15/2015
Staff:	Ryan Moroney - SC
Staff Report:	06/19/2015
Hearing Date:	07/8/2015

STAFF REPORT: CDP HEARING

Application Number:	3-15-0144
Applicant:	City of Santa Cruz
Project Location:	San Lorenzo River Mouth at Main Beach in the City of Santa Cruz.
Project Description:	Institute a three-year pilot program allowing two management activities (1) periodic mechanical breaching in 2015 and 2016; (2) and seasonal culvert installation and removal in 2016 and/or 2017 to avoid the need for breaching; to prevent localized flooding caused by seasonal lagoon formation at mouth of the San Lorenzo River.
Staff Recommendation:	Approval with Conditions.

SUMMARY OF STAFF RECOMMENDATION

The City of Santa Cruz is proposing to implement a three-year Interim Management Program (IMP) for the San Lorenzo River in order to control water elevation of the lagoon to prevent localized flooding to public and private properties and infrastructure. The IMP is designed as an adaptive management program for addressing activities related to fisheries habitat, flooding, and public access and safety where the river mouth empties at Santa Cruz Main Beach. The IMP includes two management activities to be implemented during the proposed three-year management period of 2015 through 2017: installation of "Temporary Outlet Channels" (i.e.

mechanized breaching of the lagoon) that would be implemented in 2015 and potentially in 2016; and 2) installation of a temporary "head-driven" culvert that would be implemented in 2016 (if funding is secured) and also in 2017.

The project area encompasses the San Lorenzo River lagoon, which is defined as the area of inundation under closed sandbar conditions from the river mouth to Water Street Bridge, and adjacent beach areas. Actual construction activities would take place only on the eastern most portion of Santa Cruz's Main Beach where the River meets the Pacific Ocean.

The Coastal Act authorizes flood protection projects in riverine systems in order to protect existing development only where the project is the least environmentally damaging "feasible" alternative and all feasible mitigation measures are implemented. In this case, the City has documented flooding impacts to existing public infrastructure and private property as a result of heightened elevation of the seasonal lagoon/estuary that forms on the San Lorenzo River typically in the summer/fall season. Over the course of the past several months, the City has been working with Federal and State resource agencies, including Commission staff, in an attempt to develop a preferred management program for the River that balances the need for protection of natural resources with the need to protect existing development from these flooding impacts. The proposed "head-driven" culvert management option is the culmination of those efforts. The overall intent of the IMP is to provide time to finalize, fund and implement the culvert, and then test its effectiveness as the environmentally preferred long-term strategy, while in the meantime allowing mechanical breaching of the lagoon system as necessary to avoid flooding impacts until the culvert is in place.

Given the timing of the current lagoon formation season (i.e. summer/fall 2015), the temporary outlet channel appears to be the only feasible option available to address the flooding issue this season since the culvert is still in the design phase. Staff is therefore recommending that this permit authorize mechanical breaching of the lagoon up to six times in the current lagoon season (through December 20, 2015) subject to numerous impact avoidance and mitigation measures. However, staff believes that it is feasible, as that term is defined in the Coastal Act, to implement the culvert project by the beginning of the 2016 lagoon season (i.e. summer 2016), and thus the culvert would be the least environmentally damaging alternative to address flooding impacts after this season. With the culvert in place, mechanized breaching of the lagoon would not be necessary or allowed. Staff is further recommending that the design, construction and implementation of the culvert structure be conditioned to avoid impacts to natural resources, public access and recreation, and visual resources to the maximum extent feasible, and that the City provide a monitoring report at the end of the three year IMP period to assess the functionality and effectiveness of the culvert. As conditioned, staff believes the project is consistent with the requirements of the Coastal Act.

Accordingly, staff recommends that the Commission approve a CDP with conditions for the project. The motion to act on this recommendation is found on page 4 below.

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APPENDICES

EXHIBITS

I. MOTION AND RESOLUTION

Staff recommends that the Commission, after public hearing, **approve** a coastal development permit for the proposed development. To implement this recommendation, staff recommends a **YES** vote on the following motion. Passage of this motion will result in approval of the CDP as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Motion: *I move that the Commission approve Coastal Development Permit Number 3-15-0144 pursuant to the staff recommendation, and I recommend a yes vote.*

Resolution to Approve CDP: *The Commission hereby approves Coastal Development Permit Number 3-15-0144 and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.*

II. STANDARD CONDITIONS

This permit is granted subject to the following standard conditions:

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

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

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

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

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

III. SPECIAL CONDITIONS

1. Temporary Outlet Channel. This Coastal Development Permit authorizes the City of Santa Cruz to construct a temporary estuary outlet channel (i.e. mechanized breaching) on Main Beach in Santa Cruz to prevent flooding and property damage due to high water levels in the seasonal lagoon at the mouth of the San Lorenzo River. All development shall be limited in scale and scope to that specifically identified in the San Lorenzo River Lagoon Interim Management Program Plans, Sheets 4-5 stamped "received" in the Coastal Commission's Central Coast District Office on April 14, 2015, with the following changes and clarifications. Minor adjustments to these requirements may be allowed by the Executive Director if such adjustments: (1) are deemed reasonable and necessary; and (2) do not adversely impact coastal resources:

a. ***Maximum number of events/timing*****.** The development authorized by this permit includes up to six breaching events of the San Lorenzo lagoon sandbar, for the remainder of the summer/fall season of 2015 (i.e. until November 15, 2015). The Executive Director may allow up to six breaching events 2016 if the City demonstrates it has not yet obtained the necessary funding and/or the necessary additional data to implement the Temporary Head-Drive Culvert project; however, in no case may breaching occur after November 15, 2016 without an amendment to this permit.

b. ***Water Surface Elevation Level.*** Prior to each breaching event, the City shall consult with California Department of Fish and Wildlife and National Marine Fisheries Service to establish the minimum lagoon Water Surface Elevation level that the agencies require to be maintained for each such event. The City will present the results of its consultations with CDFW and NMFS to the Executive Director for review and written authorization, which will be required before the onset of each breaching event.

c. ***Mitigation Measures.*** The project shall incorporate and comply with all avoidance and minimization measures for biological impacts identified in the Initial Study and Mitigated Negative Declaration (**Exhibit 7**), including but not limited to, Mitigation Measure 1 identified in the Mitigation and Monitoring Program at pages 11-12 of the IS/MND Response to Comments which requires: 1) avoiding construction activities in the wetted areas of the lagoon; 2) implementing fish surveys prior to installation of the temporary outlet channel; 3) collecting any tidewater gobies on the dewatered sandbars and in the outlet channel, and 4) releasing them in a safe location. Additionally, mitigation measures required by the California Department of Fish and Wildlife or other resource agencies, including, but not limited to, temporary or permanent fish refugia structures placed with the San Lorenzo River/Lagoon system, may be incorporated into the Project subject to approval by the Executive Director.

d. ***Fish Monitoring.*** In addition to the requirements set forth in the Mitigation and Monitoring Program (**Exhibit 7**), a qualified fish biologist shall be present during all breaching activities, and shall monitor the lagoon sandbar and new channel structure for as long as the breaching activities authorized under this CDP persist. The biological monitor shall ensure that all breaching activities are limited to the least amount necessary to address the flooding impact, and that such activities avoid impacts to adjacent marine and lagoon resources to the maximum extent feasible, including through adaptive

management measures to respond to changing conditions and/or updated information with respect to flood risk and habitat impacts. Within two weeks of any breaching episode, the biological monitor shall submit a written report to the Executive Director and to CDFW and NMFS staff that documents whether any fish mortality resulted from breaching activities. If fish mortality was documented, the report shall contain the estimated number and species of affected fish. The report shall also contain a section discussing appropriate mitigation measures to address such impacts to sensitive coastal resources.

All requirements above shall be enforceable components of this CDP, and the Permittee shall undertake development in accordance with this condition.

2. Head Driven Culvert. This Coastal Development Permit authorizes the City of Santa Cruz to install a temporary "head-driven" culvert in the San Lorenzo River channel that will extend through the lagoon and terminate in a duck-bill valve on Main Beach in Santa Cruz to prevent flooding and property damage due to high water levels in the seasonal lagoon at the mouth of the San Lorenzo River. The culvert shall be installed in the spring of 2016. If funding and/or required data are not available in 2016, the culvert may be installed in the spring of 2017. All development shall be limited in scale and scope to that specifically identified in the San Lorenzo River Lagoon Interim Management Program Plans, Sheets 1-3, and 5 stamped "received" in the Coastal Commission's Central Coast District Office on April 14, 2015, with the following changes and clarifications. Minor adjustments to these requirements may be allowed by the Executive Director if such adjustments: (1) are deemed reasonable and necessary; and (2) do not adversely impact coastal resources:

a. ***Water Quality Testing at Location of Risers.*** PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION, the Permittee shall conduct testing, including but not limited to the use of piezometers, which will demonstrate the ability of the project to efficiently export saltwater from the bottom of the lagoon through the porous portions of the risers.

b. ***Final Culvert Design.*** PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION, the Permittee shall submit two copies of the final design plans for the Culvert to the Executive Director for review and approval. The final design shall ensure the following:

i. Location. The culvert structure shall be located as near as is feasible to San Lorenzo Point, consistent with other design and operational requirements.

ii. Installation. The culvert structure shall be installed in early morning hours based on negative low tides in order to avoid impacts to recreational beach users.

iii. Salt Water Export. Based on the results of the Water Quality Testing required by Special Condition 2.a., the final culvert design shall include passive export of saltwater from the lagoon bottom to the maximum extent practicable; and

iv. Target Water Surface Elevation. The final culvert design shall allow the weir/overflow feature to be adjusted to achieve different target Water Surface Elevations, including, at a minimum, 6.5 feet, 6.0 feet, 5.5 feet, and 5.0 NGVD29.

v. Camouflaging of Duckbill Feature and Risers. The duck-bill outlet feature will be painted in a light tan color to blend in with the existing beach.

c. ***Maintenance of Maximum Feasible Water Surface Elevation.*** The Culvert shall be operated to ensure the highest Water Surface Elevation of the lagoon is maintained consistent with the prevention of flooding and in consultation with NMFS and CDFW to ensure the protection of fish species. However, to ensure adequate water depth for fish species, the culvert may not be operated to lower the Water Surface Elevation under 5.0 feet NGVD29.

d. ***Culvert Operation.*** With the exception of the target Water Surface Elevation identified above, the culvert shall be operated consistent with the Proposed Head-driven Culvert Operation Procedures described in Exhibit B of the Initial Study and Negative Declaration "Response to Comments." (See **Exhibit 7.**)

e. ***Maintenance of Culvert Structure.*** The Permittee shall maintain the culvert at or below ground surface adjacent to San Lorenzo Point, and shall rebury the culvert piping and outlet feature using hand tools if exposed.

f. ***Monitoring and Reporting.*** By February 1, 2018, the Permittee shall submit a report to the Executive Director documenting the overall effectiveness of the culvert structure in terms of maintaining water quality, natural resource impacts, flood control, public access and recreation and aesthetic impacts. This report shall include a detailed discussion of flooding impacts to public infrastructure and private property based on various Water Surface Elevations of the lagoon, including, at a minimum whether and to what extent flooding impacts occur at lagoon WSE's of 6.5 feet, 6.0 feet, 5.5 feet, and 5.0 NGVD29.

g. ***Mitigation Measures.*** The project shall incorporate and comply with all avoidance and minimization measures for biological impacts identified in the Initial Study and Mitigated Negative Declaration, including, specifically, Mitigation Measures 1 and 2 identified in the Mitigation and Monitoring Program at pages 11-12 of the IS/MND Response to Comments (**Exhibit 7**).

All requirements above shall be enforceable components of this CDP, and the Permittee shall undertake development in accordance with this condition.

3. Construction Plans. PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION (mechanical breaching or temporary head-drive culvert installation/removal), the Permittee shall submit two copies of a Construction Plan to the Executive Director for review and approval. Minor adjustments to this Plan may be allowed by the Executive Director if such adjustments: (1) are deemed reasonable and necessary; and (2) do not adversely impact coastal resources. The Construction Plan shall, at a minimum, include the following:

a. Construction Areas. The Construction Plan shall identify the specific location of all construction areas, all staging areas, and all construction access corridors in site plan view.

All such areas within which construction activities and/or staging are to take place shall be minimized to the maximum extent feasible in order to have the least impact on public access and shoreline resources, including by using alternative areas for staging and storing construction equipment and materials as feasible.

b. Construction Methods. The Construction Plan shall specify the construction methods to be used, including all methods to be used to keep the construction areas separated from public access through the construction area and public recreational use areas.

c. Construction BMPs. All construction activities shall limit impacts to coastal resources (including public recreational access, habitat areas, San Lorenzo River and Lagoon, and the Monterey Bay) to the maximum extent feasible including by, at a minimum, adhering to the following construction requirements (which may be adjusted by the Executive Director if such adjustments: (1) are deemed necessary due to extenuating circumstances; and (2) will not adversely impact coastal resources):

i. All areas within which construction activities and/or staging are to take place shall be minimized to the maximum extent feasible in order to minimize construction encroachment on the shoreline and to have the least impact on public access and the marine environment.

ii. Construction work and equipment operations shall not be conducted seaward of the mean high water line unless tidal waters have receded from the authorized work areas.

iii. Any construction materials and equipment placed on the beach during daylight construction hours shall be stored beyond the reach of tidal waters. All construction materials and equipment shall be removed in their entirety from the beach area by sunset each day that work occurs.

iv. Good construction site housekeeping controls and procedures (e.g., clean up of all spills immediately; keep equipment covered and out of the rain; remove all trash and construction debris from the beach; etc.) shall be applied.

v. All construction activities that result in discharge of materials, polluted runoff, or wastes to the beach or the adjacent marine environment are prohibited. Equipment washing, refueling, and/or servicing shall not take place on the beach. Any erosion and sediment controls used shall be in place prior to the commencement of construction as well as at the end of each work day.

vi. All accessways impacted by construction activities shall be restored to their pre-construction condition or better within three days of completion of construction.

vii. Any beach sand in the area that is impacted by construction shall be sifted or filtered as necessary to remove any construction debris.

viii. All contractors shall ensure that work crews are carefully briefed on the importance of observing the construction precautions given the sensitive work environment. Construction contracts and/or agreements shall contain appropriate penalty provisions sufficient to offset the cost of retrieval/clean up of foreign materials not properly contained and/or remediation to ensure compliance with this CDP otherwise.

ix. The Permittee shall notify planning staff of the Coastal Commission's Central Coast District Office immediately upon completion of construction and required restoration activities. If planning staff should identify additional reasonable restoration measures, such measures shall be implemented immediately.

d. Construction Site Documents. The Construction Plan shall provide that copies of the signed coastal development permit and the approved Construction Plan be maintained in a conspicuous location at the construction job site at all times, and that such copies are available for public review on request. All persons involved with the construction shall be briefed on the content and meaning of the coastal development permit and the approved Construction Plan, and the public review requirements applicable to them, prior to commencement of construction.

e. Construction Coordinator. The Construction Plan shall provide that a construction coordinator be designated to be contacted during construction should questions arise regarding the construction (in case of both regular inquiries and emergencies), and that his/her contact information (i.e., address, phone numbers, etc.) including, at a minimum, a telephone number that will be made available 24 hours a day for the duration of construction, is conspicuously posted at the job site where such contact information is readily visible from public viewing areas, along with indication that the construction coordinator should be contacted in the case of questions regarding the construction (in case of both regular inquiries and emergencies). The construction coordinator shall record the name, phone number, and nature of all complaints received regarding the construction, and shall investigate complaints and take remedial action, if necessary, within 24 hours of receipt of the complaint or inquiry.

f. Notification. The Permittee shall notify planning staff of the Coastal Commission's Central Coast District Office at least three working days in advance of commencement of construction, and immediately upon completion of construction.

4. Other Agency Approvals. The Permittee shall comply with the conditions of all permits and approvals of other agencies, including, but not limited to, the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Fish and Wildlife, the California Regional Water Quality Control Board, and the Monterey Bay National Marine Sanctuary. The City shall notify the Executive Director of any proposed changes to the approved project, including any modifications to any of the above agencies' permit conditions. The Executive Director will review such changes and determine if an

amendment to this Coastal Development Permit is necessary. A copy of all monitoring reports required under the above agencies' permits and approvals, including all monitoring plans submitted to the California Fish and Wildlife Service and National Marine Fisheries Service, shall be submitted to the Executive Director for his review in a timely manner once they are completed.

5. Assumption of Risk, Waiver of Liability and Indemnity. By acceptance of this permit, the Permittee acknowledges and agrees, on behalf of itself and all successors and assigns: (i) that the site is subject to hazards from episodic and long-term shoreline retreat and coastal erosion, high seas, ocean waves, storms, tsunami, tidal scour, coastal flooding, and the interaction of same; (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 due to such hazards), expenses, and amounts paid in settlement arising from any injury or damage.

IV. FINDINGS AND DECLARATIONS

A. PROJECT LOCATION AND BACKGROUND

Project Location

The project site is located on private property owned by the Santa Cruz Seaside Company (Seaside Company) as well as within sovereign tidelands and submerged lands that have been transferred, in trust, from the State Lands Commission to the City of Santa Cruz. The mouth of the San Lorenzo River (River) is characterized by both natural and built features including San Lorenzo Point, a rock outcrop of the Purisima mudstone formation on the River's eastern edge, and the Santa Cruz Main Beach to the south and west. The lagoon that forms seasonally is generally situated at the confluence of the San Lorenzo River and the Pacific Ocean and is constrained by the river levees, the historic Santa Cruz Boardwalk (Boardwalk) to the west, and San Lorenzo Point. See **Exhibit 1** for a project location map; See **Exhibit 2** for photos of the site.

The San Lorenzo River and its Lagoon System

The San Lorenzo River drains an approximately 137-square mile watershed into the Pacific Ocean at the north end of the Monterey Bay. The City of Santa Cruz is located adjacent to the lower three miles of the River and encompasses much of the River's historic floodplain. The County of Santa Cruz has jurisdictional authority of the area of the watershed beyond the City limits. In the late 1950's, the Army Corps of Engineers (ACOE) constructed a flood control project along the San Lorenzo River, creating a flood control channel and associated levees for the lower 2.5 miles of River located seaward of Highway 1. In 1994 the ACOE approved the San Lorenzo River Flood Control and Environmental Restoration Project improvements, which were

completed in 2003. That project raised the levee height, replaced storm drains, and revegetated the outer levee slopes with native riparian species.

A seasonal lagoon forms at the mouth of the San Lorenzo River each summer and fall, which is typical of many coastal watersheds in California. The sandbar that forms the downstream side of the lagoon evolves seasonally in response to coastal processes of waves, wave run up, tides and sand supply. All of these processes vary seasonally and can affect the lagoon's water level. The lagoon receives both freshwater river flows and saltwater from oceanic tides and wave overtopping. This exchange of flows with the ocean is controlled by the shape and depth of the River mouth, which is primarily formed by wave action and tidal scour.

Federally endangered Central California Coast Evolutionarily Significant Unit Coho salmon (*Oncorhynchus kisutch*) and federally threatened Central California Coast Distinct Population Segment steelhead (*Oncorhynchus mykiss*) occur or have the potential to occur within the San Lorenzo River's lagoon. Additionally, designated critical habitat for both of these listed species occurs within the proposed project reach. The site also supports Essential Fish Habitat (EFH) for various life stages of fish managed under the Pacific Coast Groundfish Fishery Management Plan (FMP), Coastal Pelagic Species FMP, and the Pacific Coast Salmon FMP. The tidewater goby (*Eucyclogobius newberryi*), which is a federally listed endangered species and is state listed as a species of special concern, is also known to inhabit the lagoon. According to the National Marine Fisheries Service (NMFS), in order to protect these species, the lagoon should be managed at a Water Surface Elevation of *at least 5 feet* NGVD29,[1] but higher elevations (i.e. increased depth) would increase the extent and quality of steelhead rearing habitat.

Impacts Arising from Lagoon Formation

As discussed in more detail below, seasonal lagoon formation has resulted in documented flooding of public and private infrastructure and properties in the immediate vicinity of the lower river and in downtown Santa Cruz. Facilities impacted by flooding include: the Santa Cruz Beach Boardwalk; the U.S. Army Corps San Lorenzo River Flood Control Project levee system and drainage facilities; the City of Santa Cruz storm drain system; streets and traffic light electrical systems along East Cliff Drive; the bikeway along San Lorenzo River levee system; and residential properties to the north at Lower Ocean Street that experience high groundwater and flooding in yards and basements. In addition, the historic Del Mar Theater in downtown Santa Cruz experienced basement flooding in 2014 during a prolonged lagoon closure period. Other issues associated with closed lagoon conditions include public access and safety for Santa Cruz Main Beach, an area visited by over three million people annually. Under closed conditions, a spillover channel eventually forms, and can bifurcate the beach in a westerly direction making lifeguard access to the ocean edge difficult and hazardous. The spillover channel is also attractive to inexperienced swimmers who wish to avoid the ocean, creating

[1] National Geodetic Vertical Datum of 1929 (NGVD29 or NGVD) is a vertical control datum. It was established throughout the United States in 1929 through a general adjustment and is used to establish vertical control for survey purposes. NGVD29 was generally equivalent in 1929 to mean sea level (MSL) but as sea level has changed MSL and NGVD29 have become slightly different. Due to a more recent general adjustment, the North American Vertical Datum of 1988 (NAVD88) has replaced NGVD29 as a vertical control and it is gradually being incorporated into land surveys. In the Monterey Bay area, NGVD29 is still used commonly by many communities.

additional safety concerns for beach lifeguards due to an uneven bottom and depth that may be present, as well as water quality concerns. While the City has not provided a detailed analysis of what exact Lagoon Water Surface Elevation[2] (WSE) (i.e. lagoon depth) directly results in what specific impact to existing development, it does appear that flood protection is needed to protect existing structures at higher water surface elevations.

See **Exhibit 4** for a letter from the City's Public Works Director regarding flooding impacts to infrastructure. See **Exhibit 6** for photographs of flooded infrastructure.

The City's Prior Lagoon Management Efforts and Plans

The City has considered management options for the San Lorenzo River Lagoon since the late 1980s. The San Lorenzo River Enhancement Plan, adopted by the City Council in 1989, contained a series of recommendations to restore the environmental integrity of the San Lorenzo River, including construction of a summer River mouth drain system. The purpose of the drain system was intended to allow a regulated flow of water from the river mouth when the natural flow of water is blocked during the summer months by a sandbar, in order to address flooding impacts associated with lagoon formation. However, the proposal was suspended in 1993 due to costs, feasibility and potential legal issues for the City.

The Lower San Lorenzo River and Lagoon Management Plan (Plan), prepared in 2002, provided an update to the 1989 San Lorenzo River Enhancement Plan. This Plan included recommendations for lagoon water management during the summer, including artificial management of the sandbar at the lagoon upon completion of a water quality study. The Plan also recommended consideration of alternative management strategies to address steelhead needs in case it was not feasible to control summer lagoon water levels artificially. The Plan was included as an appendix in the San Lorenzo Urban River Plan (SLURP), adopted by the City Council in June 2003. The SLURP did not include specific recommendations or actions related to management of the lagoon's sandbar and associated issues with respect to flooding, public safety and access, and habitat conditions at the River mouth. However, policies developed from the SLURP that were certified as part of the City's Local Coastal Plan (LCP) included developing a strategy for summer lagoon management.

2012 Emergency Permit

In March 2012, following late season heavy rains, the San Lorenzo River deflected to the west and threatened to flood the Santa Cruz Beach Boardwalk's basement and other Boardwalk facilities. Commission staff issued an emergency coastal development permit (ECDP 3-12-009-G), authorizing the Seaside Company, acting as contractor and agent for the City of Santa Cruz, to breach the lagoon to divert the flow of the San Lorenzo River to prevent flooding of the Boardwalk's facilities. The ACOE also approved an emergency permit for the breaching. The emergency work entailed creating a channel to direct the river to the sea through two berms to avoid/minimize damage to existing Boardwalk facilities. One of the permit conditions required

[2] Water Surface Elevation is defined as the height, in relation to the National Geodetic Vertical Datum (NGVD) of 1929, of a body of water or, for flood determination, for the specification of floods of various magnitudes and frequencies in the floodplains or coastal or riverine areas.

the Permittee (the City of Santa Cruz) to apply for a regular coastal development permit and to provide a comprehensive response to the issue of San Lorenzo River management in a manner most protective of the beach area, San Lorenzo River resources, and public recreational access without the need for regular mechanized breaching.

2014 Emergency Permit

On September 26 and 27, 2014, the Santa Cruz Seaside Company conducted a controlled breach of the lagoon under Emergency CDP # G-3-14-0031. The purpose was to lower lagoon water levels from 7 to 5 feet NGVD29 through a managed channel without a complete breach that would rapidly dewater the lagoon. On both days, a channel was excavated at the far eastern end of Main Beach near the Trestle Bridge. The channel was approximately 10 feet in width and 750 feet in length at its initial cut. The orientation of the channel was roughly southwest and directed approximately toward the mid-point on the wharf. The channel was opened on an incoming tide. At the end of both days, the channel was mechanically closed by filling it with sand to prevent further drainage and scouring of the channel. The volume of sand needed to close the channel at the end of the day was estimated between 1,000 and 1,200 cubic yards. Biological monitoring and before-and-after water quality conditions were also documented for this event. According to the City's biologist, there were four documented mortalities of tidewater goby.

Development of the San Lorenzo River Interim Management Program

The City and its consultants developed the proposed "San Lorenzo River Interim Management Program" (IMP) following review of existing data on water quality, stream flow, biological resources, and fisheries of the San Lorenzo River Lagoon. The City also completed a "Coastal Process and Data Integration Report" to add to the scientific understanding of the lagoon's physical processes and conditions. The City also reviewed management plans, biological opinions, and permits for other coastal lagoon management programs underway in California, including those for Soquel Creek, Scott Creek, the Russian River and the Pajaro River. The City developed a variety of alternative methods to manage the lagoon, which were further analyzed in the "San Lorenzo River Lagoon Interim Management Program Geomorphic and Engineering Channel Feasibility Study." Feasibility analyses included: creation of a water balance model for the lagoon; developing flow rate criteria for each alternative; calculating and verifying lagoon filling rates; and habitat considerations, including estimates of the amount of freshwater volume associated with the target lagoon volume needed to provide suitable habitat for steelhead and tidewater goby.

As part of these efforts the City of Santa Cruz convened a series of meetings with Federal and State natural resource agencies to develop a framework for the IMP based on existing conditions, established objectives, and a timeframe for implementation. Meetings were held in the fall of 2014 to review existing site conditions and coastal process findings; to discuss management alternatives and the preferred set of management activities. The City presented its final lagoon management alternatives to the agencies in December 2014.

B. PROJECT DESCRIPTION

The IMP includes two management activities to be implemented during the proposed three-year management period from 2015 thru 2017: (1) Temporary Outlet Channels (mechanized lagoon breaching) to be implemented in 2015 and potentially in 2016; and (2) seasonal installation and removal of a Head Driven Culvert that would be implemented in 2016 and in 2017. Proposed management activities will take place only at the lower 700 feet of the river channel and beach. The potential area of direct disturbance for either management activity would encompass approximately 0.15 acres. The purpose of the proposed culvert project is to gather data to determine if installation of a permanent culvert structure to manage the lagoon is feasible at this location. The City also is requesting approval of temporary breaching events in the interim (i.e., in 2015 and potentially in 2016) until funding of the seasonal culvert structure is obtained and the culvert is installed.

Temporary Outlet Channel (Mechanized Lagoon Breaching)

The application proposes to construct a "Temporary Outlet Channel," i.e. mechanized lagoon breaching, up to six times during the summer/fall season as needed to achieve a Lagoon Water Surface Elevation of 5.0 NGVD29 . Such breaching would only be done during the 2015 season and possibly the 2016 season if the temporary head-drive culvert has not been installed. The outlet channel would allow the lagoon to draw down to 3.0 to 4.0 NGVD29, and then the lagoon would be mechanically closed. Construction work for each individual breaching event would be accomplished in one day.

Construction of the outlet channel would involve excavation of a variable width channel diagonally on the beach to establish a controlled, slow drain. Typical dimensions would be on the order of 35 to 50 feet in width and 75 feet in length, but each outlet channel will be designed at the time of implementation in consultation with the resource agencies and according to beach elevation, lagoon elevation, tides and other factors. Approximately 1,000 cubic yards of beach sand over an estimated 0.15-acre area will be moved to construct an outlet channel.

Based on the results of the outlet channel installed in September 2014, the City, in coordination with State and Federal agencies, has developed criteria for mechanical breaching of the lagoon, including action triggers, a notification process involving the resource agencies, plan development (based on existing conditions), public notification, and construction implementation. Specifically, a shallow part of the lagoon (~2 feet deep) will be used as a sill to reduce the likelihood of headcutting[3] and scour up to the thalweg[4] to reduce the possibility of completely draining the lagoon. Using heavy equipment, a sand track "peninsula" will be graded in the lagoon near the outlet opening on the beach side. This peninsula will act to control the

[3] In fluvial geomorphology, "head cut" is an erosional feature of some intermittent and perennial streams where an abrupt vertical drop, also known as a knickpoint, occurs in the streambed. The knickpoint, i.e. where a head cut begins, can be as small as an overly-steep riffle zone or as a large as a waterfall. When not flowing, the head cut will resemble a very short cliff or bluff. A small plunge pool may be present at the base of the head cut due to the high energy of falling water. As erosion of the knickpoint and the streambed continues, the head cut will migrate upstream.

[4] In fluvial geomorphology, a "thalweg" is the line of lowest elevation within a watercourse.

direction of flow and headcutting. Once established, a blade will be used to cut a shallow opening to begin flow from the lagoon to the ocean. The breaching crew will maintain sand piles adjacent to the inlet to provide the ability to immediately control headcutting. Once the desired lagoon elevation is reached, the outlet channel would be closed. The City will also employ measures to avoid and/or minimize potential environmental impacts and implement "Minimization Measures" and "Best Management Practices" developed in conjunction with the resource agencies to protect water quality and to prevent fish from being swept to sea during breaching activities, including: 1) avoiding construction activities in the wetted areas of the lagoon; 2) implementing fish surveys prior to installation of the temporary outlet channel or head driven culvert, and; 3) collecting any tidewater gobies on the dewatered sandbars and in the outlet channel, and releasing them in a safe location.[5]

Temporary Head-Driven Culvert

The City's stated purpose of the temporary Head-Driven Culvert (Culvert) component of the proposed IMP is to allow the lagoon elevation to reach 5.0 feet NGVD29 under normal river mouth closure conditions and then to maintain that elevation through passive removal of water from the lagoon via overflow of surface waters through a small weir and infiltration through the barrier sandbar as an additional contribution. A series of three 4-foot diameter standpipes (risers) would be partially buried in the lagoon adjacent to San Lorenzo Point. These risers would be connected to a horizontal culvert buried under the beach connecting the lagoon to the Pacific Ocean with a duck-bill outlet. Lagoon water would seep into the porous bottoms of the risers, feeding flows into the horizontal culvert. Outflows through the culvert would be driven by the head difference between the closed lagoon and the ocean. All risers would be connected to the horizontal culvert at approximately 3.0 feet NGVD29. Since the culvert will act to export water supplied to it by the risers, setting the connection at this level will maintain a head difference between the lagoon and riser. Seepage flows into the riser would be driven by this head difference, so that flows into the riser will be zero when the lagoon is at 3.0 feet NGVD29 and will increase to 0.5 - 1.0 cubic feet per second (cfs) per riser at 5.0 feet NGVD29. A site plan is shown on page 4 of **Exhibit 3**, and a cross section and detail of the proposed culvert and duck-bill outlet is shown on pages 5-7 of **Exhibit 3**.

Installation of the Culvert

The culvert and intake structures would be installed in the spring season after flood flows have subsided. Installation may occur when the mouth is open or closed as long as equipment can access the work area safely, although construction during open mouth conditions is preferable, before flows on the San Lorenzo River at the USGS Santa Cruz gage drop below 20 cubic feet per second (cfs). The project engineer has estimated that the culvert could be constructed in less than two weeks. Installation would also include a notification process involving the resource agencies, a description of the construction techniques, best management practices, and impact minimization measures.

Installation of the culvert would require excavation of approximately 700 linear feet of the channel bed at a depth of two to three feet at the east end of the Main Beach, and the culvert

[5] Since steelhead have high mobility and are most likely to be in the water column in deeper water, they are not generally susceptible to stranding during breach events.

would be constructed in 100-foot segments with backfill between each segment. An estimated 500 cubic yards of material will be excavated and refilled to bury the pipe within an approximate area of 0.026 acres. The 100-foot pipe sections would be connected with flanges. At the connection points, the culvert would be weighted down with concrete weights. The purpose of the weights is to hold the culvert in place and prevent it from being washed out during flood events. A series of H-piles would hold the risers in place.

To minimize the overall duration of the construction, installation of the intake structure (risers, H-piles, gate valve) and the outlet culvert would be performed at the same time. For the intake structure, a track-mounted hydraulic excavator, similar to that used for the previous breach excavations, would be used to place materials at the intake structure location while crews assemble and install the elements. Concurrently, the outlet culvert pipe and anchors would be installed in approximately 100-foot segments. The most up-to-date equipment Best Management Practices will be deployed during construction.

The proposed culvert is a temporary facility, and the City intends to remove all culvert components before the River breaches naturally at the start of the rainy season, when the river typically flows unobstructed to the ocean. However, if the River breaches naturally while the culvert is still in place, the weights on the culvert will have the additional function of limiting migration of the outfall pipe and thereby facilitating recovery, i.e. the weights should ensure that the culvert will not break free if a natural breach occurs before the culvert is removed. In any case, to ease culvert removal activities, lifting hooks can be incorporated into the weight supports, and bolted flange connections will allow for pipe detachment.

Operation of the Culvert

Once installed, the City proposes to operate the culvert to maintain a perched lagoon with a water surface elevation at about 5.0 feet NGVD29. If the culvert is installed at a lower water surface elevation, the valve on the culvert would remain closed to allow the lagoon to reach a higher water level for the benefit of fish species. The City proposes to maintain the lagoon at 5.0 feet NGVD29 to prevent flooding impacts that occur when the Lagoon water surface elevation exceeds this threshold. For the majority of closure events, the lagoon stage rises to the target flood stage of 5.0 feet NGVD29 within several days, but during drought years this may take over one week. To allow the lagoon to reach this elevation naturally (and thus maximize freshwater habitat in the lagoon to benefit fish species), the culvert will be operated with a valve. The City's proposed operation procedure can be summarized as follows:

- During and immediately after culvert system installation, the valve would be closed, so that no flows leave the lagoon through the culvert during open mouth conditions.
- Once river mouth closure occurs, the valve would remain closed until the lagoon stage approaches 5.0 feet NGVD29.
- Once the lagoon stage reaches a threshold level just below 5.0 feet NGVD29, the City would manually open the valve, allowing lagoon water to seep into the risers and flow through the culvert, ultimately discharging through the duck-bill outlet onto the beach directly adjacent to the ocean.

Demobilization of the Culvert

Demobilization of the culvert structure would likely occur in October or November, prior to the first major rainfall events, if practicable. It is possible that removal of some or all of the structure may be impeded by conditions such as high river flows, a deep river mouth which prevents access to the culvert's components, or powerful wave runup. Therefore, the precise timing of demobilization is not known and will be dependent on an assessment of existing conditions and risks. Demobilization of the culvert would involve a similar procedure as installation: segments would be removed in pieces, sequentially excavating and backfilling until all segments are removed, so that the excavation never spans the full width of the beach. Removal of the culvert will take approximately two weeks.

See **Exhibit 3** for project plans.

C. STANDARD OF REVIEW

The project is located on tidelands, submerged lands, and public trust lands within the Commission's adopted original jurisdiction boundary. Thus, the standard of review for the proposed project is the Chapter 3 policies of the Coastal Act.

D. FLOOD CONTROL AND MARINE RESOURCES

Section 30236 of the Coastal Act governs water supply and flood control:

> *Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (l) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.*

Thus, the Coastal Act recognizes the need for flood control projects to protect public infrastructure and private property, but also acknowledges that such projects can, by their very nature, result in impacts to important coastal resources. Thus, in order to minimize such impacts, the Act requires that 1) the most environmentally protective "feasible" option to protect existing development be employed, and 2) that all feasible mitigation measures be incorporated into the project.

Other sections of the Coastal Act reiterate the need for development to protect and enhance marine resources and habitat.

Section 30230 of the Coastal Act states:

> *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.*

In addition, 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.*

Finally, Section 30240 of the Coastal Act governs development in environmentally sensitive habitat areas:

> *(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.*
>
> *(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

Analysis

As discussed above, seasonal lagoon formation at the mouth of the San Lorenzo River has resulted in documented flooding of public and private infrastructure and properties in the immediate vicinity of the lower river and in downtown Santa Cruz, including the Boardwalk, the river levee system, City infrastructure, and nearby residential properties. See, also, **Exhibit 4** (Letter from City of Santa Cruz Public Works Director regarding flooding impacts) and **Exhibit 6** for photos of flooded infrastructure**.** As indicated in the project's Initial Study and Mitigated Negative Declaration "Response to Comments," the following additional information and evidence is provided to document the flooding associated with lagoon elevations exceeding 5.0 NGVD29 and effects on City infrastructure and neighboring properties:

- *The San Lorenzo River Flood Control Levee Pump Facilities are designed to be standby storm water pumps and not as continuous water circulating pumps. From July 28, 2014 to October 8, 2014 (73 days) pumps at San Lorenzo/Bixby ran a total of 121 hours while the river was shoaled. Pumping starts at an approximate 4 foot river level. There was no significant change in run times even with a 1 foot control drop that was made in September 2014. In comparison to July 2010 to July 2011 when river flows were greater and 33.89 inches of rain fell, the pumps at San Lorenzo/Bixby ran a total of 205 (8.5 days) hours over a one-year period.*

- *Ground saturation along low-lying areas occurs north of levee. The associated rise of lagoon waters under streets and into infrastructure north of the levee includes impacts to*

pavement and street conditions and to stoplight electrical system. Photos in the Interim Management Program Project Description show ground saturation impacts along San Lorenzo Boulevard and Ocean Street, which were taken on October 22, 2014 when river levels were noted at 5.3 feet at the Soquel Bridge. These photos document a sinkhole that occurred at the time of the photo. Additional photos taken on September 16, 2014 show groundwater saturation impacting stoplight electrical wires and street pavement weeping at San Lorenzo Boulevard and Ocean Street when the river was noted at 5 feet at the Soquel Bridge at the time. Flooding of the bikeway on the San Lorenzo levee is also shown in photos from October 22, 2014.

- *Flooding in basements of buildings along Pacific Avenue in Santa Cruz is reported to the City. Most recently, the City of Santa Cruz received reports of flooding in basements of buildings along Pacific Avenue in Santa Cruz on September 14, 2014 when river levels were above 5 feet.*

Other issues associated with closed lagoon conditions include public access and safety for Santa Cruz Main Beach, an area visited by over three million people annually. Under closed conditions, a spillover channel eventually forms, and can bifurcate the beach in a westerly direction making lifeguard access to the ocean edge difficult and hazardous. The spillover channel is also attractive to inexperienced swimmers who wish to avoid the ocean, creating additional safety concerns for beach lifeguards due to an uneven bottom and significant water depth that may be present in the lagoon, as well as water quality concerns.

At the same time, the San Lorenzo River Lagoon provides important habitats for anadromous, marine and freshwater fish species and waterfowl, including several species of special status: tidewater goby (*Eucyclogobius newberryi*), Central California Coastal steelhead (*Oncorhynchus mykiss*), Central California Coastal coho salmon (*Oncorhynchus kisutch*), and their critical habitat. Indeed, lagoon habitat has been shown to be very important for rearing juvenile steelhead. In unaltered natural systems, these "closed" lagoons provide a highly productive environment for rearing juvenile steelhead due to their predominantly freshwater condition with cooler temperatures, high food production, and provision of cover from predators. The lagoon is most productive when it is either entirely freshwater, as in the summer after the mouth has closed and freshwater inflows have displaced residual salt water, or when the water column is a well-mixed combination of salt- and freshwater, typically in the winter months when the river mouth is open to tidal circulation. The lagoon habitat is not productive if it is stratified with a denser layer of salt water underlying a less dense layer of freshwater. In a prolonged stratification condition, steelhead are forced to move to the cool surface waters where little food exists and where they become more vulnerable to predation. Stratified conditions can also result in poor dissolved oxygen levels in bottom waters, which can degrade or destroy habitat for steelhead and their food.

In addition, it is important for the lagoon to maintain adequate depth in order to provide habitat for protected species. According to the comment letter from the California Department of Fish and Wildlife (CDFW), a lagoon water surface elevation of 5 feet NGVD29 is the minimum depth that would still protect species:

> *… CDFW advised the City that in order to reduce impacts to special-status fish species, the 5.0-foot was the point at which no further reductions to WSE should occur. CDFW also indicated that temporary channel outlets should be constructed of dimensions in a manner to reduce the probability of uncontrollable lagoon draining events. Furthermore, an emergency permit issued by another agency for emergency mechanical breaching of the San Lorenzo River lagoon in September 2014 also addressed these concerns and included several special conditions, including one to ensure that the lagoon did not dewater below five feet. Therefore, as previously discussed with the City, CDFW recommends that the proposed Project, as part of the three-year management plan, specifies that the channel will be excavated at an angle from the shallowest part of the lagoon and face the appropriate wave-action direction to aid in re-closure, and will be at a minimum width of 10 feet, maximum depth of 2 feet, and length of 250-1,000 feet to minimize slope and outflow velocity and reduce the rate of lagoon drainage and risk of channel scour. Additionally, CDFW recommends the Project specify that channel excavation will retain a lagoon WSE of 5.0 feet as measured at the train trestle bridge staff gage.*

Similar concerns were raised by the National Marine Fisheries Service in its comments on the project's environmental document:

> *Due to serious concerns regarding the quality and quantity of steelhead rearing habitat in the San Lorenzo River Lagoon, NMFS recommends the City manage the lagoon at a water surface elevation (WSE) of **at least** five feet (ft) NGVD29.(Emphasis added).*

While the City has not provided a detailed analysis of which exact Lagoon water surface elevation directly results in a specific impact to existing development, it does appear that flood protection is needed to protect existing structures at higher water surface elevations, i.e. in the 5.0 foot range.[6] Thus, any management program for the lagoon needs to strike an appropriate balance between protecting important coastal resources, such as fish habitat, while also minimizing the summer flooding problems in the surrounding areas caused by high summer lagoon levels. The IMP seeks to establish a management program by which lagoon habitat, flooding of public and private properties, and public safety and access conditions can be

[6] Each of the resource agencies that commented on the project IS/MND identified the lack of precise information of flood impacts as problematic in terms of defining the "target" water surface elevation: (California Department of Fish & Wildlife letter: "The IS/MND … describes the facilities and infrastructure subject to flooding such as the Santa Cruz Beach Boardwalk (Boardwalk), residential streets, and the levee and drainage system. However, … the IS/MND does not adequately quantify or relate the extent of flooding to lagoon WSE."; National Marine Fisheries Service letter: "The MND states flooding occurs when the lagoon WSE is above five ft, but does not provide exact flood stage elevations for local infrastructure. The MND states that Boardwalk facilities have been flood-proofed (new pump, resealing below-grade, and above-grade seawall), but a WSE where flooding now occurs at the Boardwalk or other City or federal facilities (e.g., levees) is not given. The MND does mention the pump system at the levees starts at approximately four ft, storm drain and basements flood higher than five ft, and the theatre floods at seven ft. Therefore, it is unclear whether or not the lagoon could be managed at an elevation potentially greater than 5.0 ft, such as 5.5, 6.0 or 6.5 ft. Higher elevations would increase the extent and quality of steelhead rearing habitat (i.e., increased depth) while potentially avoiding flooding of local infrastructure."

addressed during the interim period and evaluated for cost, reliability, and effectiveness. Due to multiple constraints at the location of the river mouth, including a heavily visited public beach and private ownership of some portions of the beach, the IMP was developed as an interim step to a long-term management plan for the area. The IMP is intended to help document the effectiveness of the proposed management activities as well as costs, roles, and efficiencies in addressing long-standing habitat, flooding, infrastructure, and access issues at the river mouth. Based on the results of the IMP, the activities included in the IMP may be considered as part of the long-term management plan developed with local, state and private partners.

Temporary Outlet Channels (mechanized breaching events)

As part of the IMP, the City is seeking authorization to mechanically breach the lagoon up to six times per year in 2015, and potentially in 2016 if the head-driven culvert project is not ready to be implemented by that time.

Under the Coastal Act a flood control project involving alteration to a river must satisfy two criteria: 1) it must be considered the most environmentally protective "feasible"[7] option to protect existing development, and 2) it must employ all feasible mitigation measures.

Mechanized breaching of the river mouth to lower the Lagoon water surface elevation in the summer months can negatively impact water quality by introducing salt water into the system and creating a stratified condition, both in terms of salinity and temperature, that can be harmful to sensitive fish resources. Lower lagoon levels also result in a reduction in habitat volume for these species because less surface area is inundated. Moreover, there may be extensive areas of sandbar in the vicinity of the river mouth, near the bend in the lagoon across from Jesse Street Marsh, and around Riverside Bridge that become dewatered as the lagoon stage falls. Based on previous experience in September 2014, tidewater gobies may be also stranded on these sandbars. Tidewater gobies may also swim or be swept into the outlet channel and potentially enter Monterey Bay, resulting in mortality. Indeed, one of the primary objectives of the IMP is to develop a management program that eliminates or minimizes the need for mechanized breaching events. The mechanized breaching component of the IMP is understood as a temporary means of flood control pending implementation of a feasible, potentially less environmentally damaging culvert component. Thus, mechanized breaching of the lagoon is neither the preferred option, nor the least environmentally damaging option, to address flooding impacts over the long term.

Having said that, the City has demonstrated that mechanized breaching is the only "feasible" option in 2015 to protect existing development, given that the lagoon formation season is currently underway, flooding of infrastructure has already occurred,[8] and the City does not currently have the funding or all the data necessary to implement the culvert option this year. The project is therefore conditioned to allow mechanized breaching of the lagoon in the current 2015 flood year. However, breaching in 2016 may only be undertaken if the City demonstrates

[7] Coastal Act Section 30108 defines feasibility as follows: "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

[8] The Lagoon breached naturally in early June 2015, thus the recent flooding issues have been abated.

that the funding and/or necessary data to implement the head-drive culvert project has not yet been obtained (See **Special Condition 1.a**). Without such data or adequate funding, this option would also be infeasible in 2016. Mechanical breaching would not be allowed in 2017 under this CDP, however, as the City would have at least two years to obtain required funding and data before that time.

Under the proposed Project, once the lagoon water surface elevation reaches 4.5 feet, the City is required to initiate a process of notification and consultation with City departments and agencies to discuss conditions and finalize plans for a breaching event. As part of each breaching event, the City proposes to drain the lagoon to a water surface elevation level of 3.0 to 4.0 feet. The City proposes to drain the lagoon to these lower levels to account for ongoing and continuous refilling of the lagoon from river water making its way downstream, which will relatively quickly bring the water surface elevation level to a higher level, even after a breaching event. The City's goal is to keep the water surface elevation level at no higher than about 5.0 feet. However, comments from CDFW and NMFS indicate that the lagoon water surface level should not be reduced below 5.0 feet. In practical terms, developing a final plan for a given breach event will involve an evaluation of specific site conditions, weather predictions, identify the preferred lagoon outlet channel location, review construction standards, and determine a desired final stage of the lagoon after water level lowering. Key considerations will include weather, swell and tide predictions, freshwater flows, and fish presence. Given all of these variables, the Commission concurs with the overall framework established by the City, which allows for some level of discretion in determining an appropriate final plan for each breach event. However, in order to ensure that coastal resources, in this case sensitive fish species, are protected to the maximum extent feasible, **Special Condition 1.b** requires that the City consult with CDFW and NMFS regarding the minimum lagoon water surface elevation level that will be required to be maintained for each breaching event, and that the results of such consultations are presented to the Executive Director for review and approval of each such event.

With regard to the second element, the Mitigated Negative Declaration recommends a suite of Mitigation Measures (see **Exhibit 7**) to protect sensitive species during mechanized breaching events. These include: 1) avoiding construction activities in the wetted areas of the lagoon; 2) implementing fish surveys prior to installation of the temporary outlet channel; 3) collecting any tidewater gobies on the dewatered sandbars and in the outlet channel, and releasing them in a safe location. Special Condition 1 requires that these measures be implemented (**Special Condition 1.c**) and includes other measures to ensure that the impacts from the breaching events are avoided or minimized to the maximum extent feasible, including: limiting the number and time of breach events (**Special Condition 1.a**); ensuring the Lagoon water surface elevation is maintained at the appropriate level to support natural resources, (**Special Condition 1.b**); biological monitoring to allow for adaptive management and to ensure impacts to fish species are minimized, including proposed mitigation measures for resource impacts (**Special Condition 1.d**); construction Best Management Practices (BMPs) (**Special Condition 3**); and requiring approval of other interested agencies (S**pecial Condition 4.**) Finally, to the extent that the mechanized breaching events are still found to negatively impacts sensitive coastal resources, implementation of the culvert component of the project can be viewed as an appropriate "in kind" mitigation for such impacts. Thus as proposed and conditioned, the project as a whole can be found consistent with the Coastal Act.

Head Driven Culvert Pilot Project

The proposed head-driven culvert is likewise required to satisfy the two criteria indicated above. With respect to the first test, whether it is the most environmentally protective, feasible means to address flood control, there is no "gold standard," universally accepted "best" means of managing such riverine systems to address the multitude of often competing issues that arise in these situations, including protection of natural resources and existing development, public safety and access, and aesthetics. The fact is that each such system is unique and the search for the "most environmentally protective" option is an ongoing effort. In this case, as discussed above, the proposed culvert design was the result of extensive review of existing data on water quality, stream flow, biological resources, and fisheries in the San Lorenzo River Lagoon, and a series of meetings in 2014 and 2015 with federal and state natural resource agencies to develop a framework for the IMP based on existing conditions, established objectives, and a timeframe for implementation. The central purpose of the IMP is to assess whether the culvert is the best option for managing this particular system, and if so, to implement it on a permanent basis.

Installation and removal of the culvert structure will involve the use of heavy equipment on the beach. However, because the culvert structure will be installed in stages after the lagoon forms, and is intended to be removed in stages before the lagoon breaches, installation and removal is not expected to result in significant impacts to biological resources. Nevertheless, if the culvert is not designed and operated appropriately, it could result in impacts to biological resources, as a result **Special Condition 2** requires a multitude of measures to ensure that the culvert is designed (**Special Condition 2.b**) and operated to minimize impacts to natural resources and in some cases enhance existing conditions for these resources. Specifically, prior to construction of the project, the City will be required to perform water quality testing to ensure that the system will allow passive export of saltwater from the lagoon bottom to provide enhanced habitat for fish species (**Special Condition 2.a**) and the final design of the culvert is required to ensure this project goal is met (**Special Condition 2.b.iii**). Also, **Special Condition 2.g** requires implementation of all Mitigation Measures of the Mitigated Negative Declaration (see **Exhibit 7**) to protect sensitive species during installation and removal of the culvert, and **Special Condition 2.d** requires that the culvert be operated consistent with the operation procedures described in Exhibit B of that document. Further, the final design of the culvert is required to allow for adjustments to maintain different target lagoon water surface elevations in order to allow for a higher elevation if conditions permit it (see **Special Condition 2.c**). Special Condition 2.c therefore requires that the culvert operation maintain the maximum water surface elevation possible consistent with flood protection. **Special Condition 2.f** requires the City to monitor flooding impacts at various water surface elevations of the lagoon and provide a report at the end of the IMP management period to assess the overall effectiveness of the culvert, including at different water surface elevations to determine the maximum water surface elevations that can be maintained without significant flooding damage to private property and public infrastructure.

There are inherent risks associated with development on and around the dynamic river/shoreline interface; this applies to the project proposed as well as for development in this area in general. The approved project is likely to be affected by flooding and coastal processes now and in the future. Although the Commission has sought to minimize the risks associated with the development proposed in this application, the risks cannot be eliminated entirely. Accordingly,

this approval is conditioned for the Permittee to assume all risks for the proposed development at this location (see **Special Condition 5**).

As conditioned, the project can be found consistent with the Coastal Act policies cited above.

E. PUBLIC ACCESS AND RECREATION

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." Coastal Act Sections 30210 through 30213, 30221 and 30223 specifically protect public access and recreation. In particular:

> ***30210.*** *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.*
>
> ***30211.*** *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.*
>
> ***30213.*** *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. …*
>
> ***30221.*** *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 clearly protect public access and recreation opportunities for the public, particularly free and low cost access.

Analysis

The Coastal Act requires maximization of public access to the beach and shoreline resources. The summer sandbar that forms at the river mouth is heavily used by the public and sometimes connects the City's Main Beach to the Seabright segment of Twin Lakes State Beach. Mechanized breaching of the river will negatively affect the usability of the affected portion of Main Beach during each breaching event. Likewise, installation and removal of the culvert will involve up to two weeks of construction on that portion of the beach, again negatively impacting public access. Once the culvert is installed, the duck bill outlet feature may also impact the public's use of the beach/ocean interface at that specific location. However, the temporary nature of creation of the outlet channel and installation/removal of the head-driven culvert are not expected to impact public access and recreation for significant periods. Moreover, the project can be conditioned to further avoid such impacts. With respect to both the temporary outlet channel and the head-drive culvert, **Special Condition 3** requires that construction and staging avoid

impacts to public access to the maximum extent feasible and requires that the site be restored at the end of each breaching event or after installation or removal of the culvert. For the temporary culvert, **Special Condition 2.b.i** requires that it be installed as close as possible to San Lorenzo Point (at the far eastern end of Main Beach) in early morning hours based on negative low tides. Further, because the duckbill outlet and some piping could potentially be exposed at the ocean side of the system due to beach erosion, **Special Condition 2.e** requires that the structure be reburied using hand tools if it becomes exposed. Thus, as conditioned, the project can be found consistent with the public access and recreation policies of the Coastal Act.

F. VISUAL RESOURCES

Coastal Act Section 30251 states:

> ***Section 30251.*** *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 in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.*

Analysis
The Coastal Act requires that scenic and visual qualities of coastal areas be protected, and specifically that permitted development "minimize the alteration of natural land forms." The Temporary Outlet Channel will have minimal impacts on public views of the beach because the breaching will occur over a limited period of time (no more than 24 hours) and then the beach will be restored to its natural configuration. The Head-Driven Culvert includes risers, a pipe structure, and a duck-bill outlet feature. Due to beach erosion, the duckbill outlet and some piping could potentially be exposed at the ocean side of the system, which could result in visual impacts to beachgoers. **Special Condition 2.e.** therefore requires that the piping and the duck-bill outlet be reburied using hand tools if they become exposed. Further, **Special Condition 2.b** requires that the duck-bill feature will be painted in a light tan color to blend in with the existing beach so that it is less visually obtrusive.

The above measures will help to minimize and mitigate the visual impacts of the proposed development. Therefore, as conditioned, the project can be found consistent with Section 30251 of the Coastal Act.

G. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Section 13096 of the California Code of Regulations requires that a specific finding be made in conjunction with coastal development permit applications showing the application to be consistent with any applicable requirements of CEQA. Section 21080.5(d)(2)(A) of CEQA

prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect that the activity may have on the environment.

The City, acting as the CEQA lead agency, adopted a Mitigated Negative Declaration for the proposed project on June 9, 2015. The Coastal Commission's review and analysis of land use proposals has been certified by the Secretary of Resources as being the functional equivalent of environmental review under CEQA. The preceding coastal development permit findings discuss the relevant coastal resource issues with the proposal, and the permit conditions identify appropriate modifications to avoid and/or lessen any potential for adverse impacts to said resources. All public comments received to date have been addressed in the findings above, which are incorporated herein in their entirety by reference.

As such, there are no additional feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse environmental effects which approval of the proposed project, as conditioned, would have on the environment within the meaning of CEQA. Thus, if so conditioned, the proposed project will not result in any significant environmental effects for which feasible mitigation measures have not been employed consistent with CEQA Section 21080.5(d)(2)(A).

APPENDIX A – SUBSTANTIVE FILE DOCUMENTS

1. San Lorenzo Lagoon Interim Management Program Initial Study and Mitigated Negative Declaration, City of Santa Cruz. (Adopted June 9, 2015).

2. "City of Santa Cruz San Lorenzo Lagoon Interim Management Program Project Description and Supplemental Project Information," Conservation Collaborative. (February 3, 2015).

3. "Biological Opinion for San Lorenzo River Interim Management Program," Hagar Environmental Science (March 15, 2015).

4. "San Lorenzo River Lagoon Interim Management Program – Coastal Processes and Data Integration to Support Interim Management Options," ESA (October 2014).

5. "San Lorenzo River Lagoon Interim Management Program: Geomorphic and Channel Feasibility Study." ESA (January 2015).

6. San Lorenzo Urban River Plan. (January 2002).

FIGURE 1A: Project Location

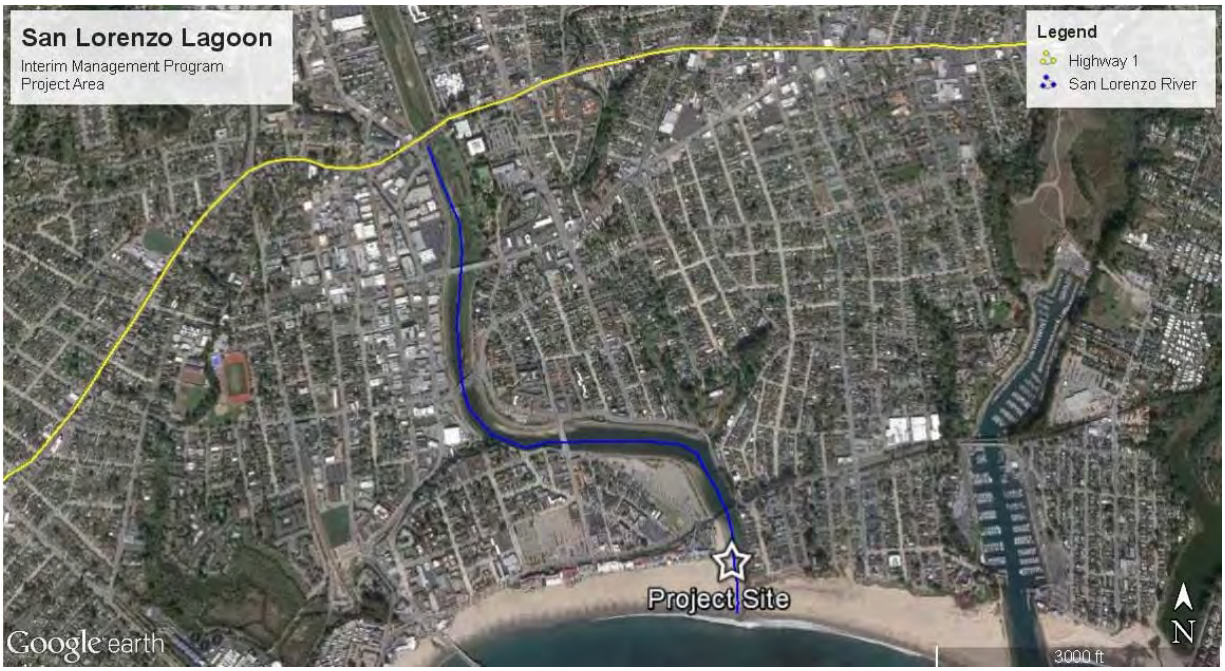

Exhibit 1
3-15-0144
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FIGURE 2: San Lorenzo River Mouth Conditions

San Lorenzo River – example of barrier beach open condition (March 16, 2002)**. Photo from California Coastal Records Project**

San Lorenzo River – example of barrier beach closed condition (October 1, 2008)**. Photo from California Coastal Records Project**

Exhibit 2
3-15-0144
1 of 2

FIGURE 3: Examples of San Lorenzo River Channel Migration

Spillover channel condition, 2014. Photo by Conservation Collaborative.

Western channel migration example, October 2005. Photo from California Coastal Records

Exhibit 2
3-15-0144
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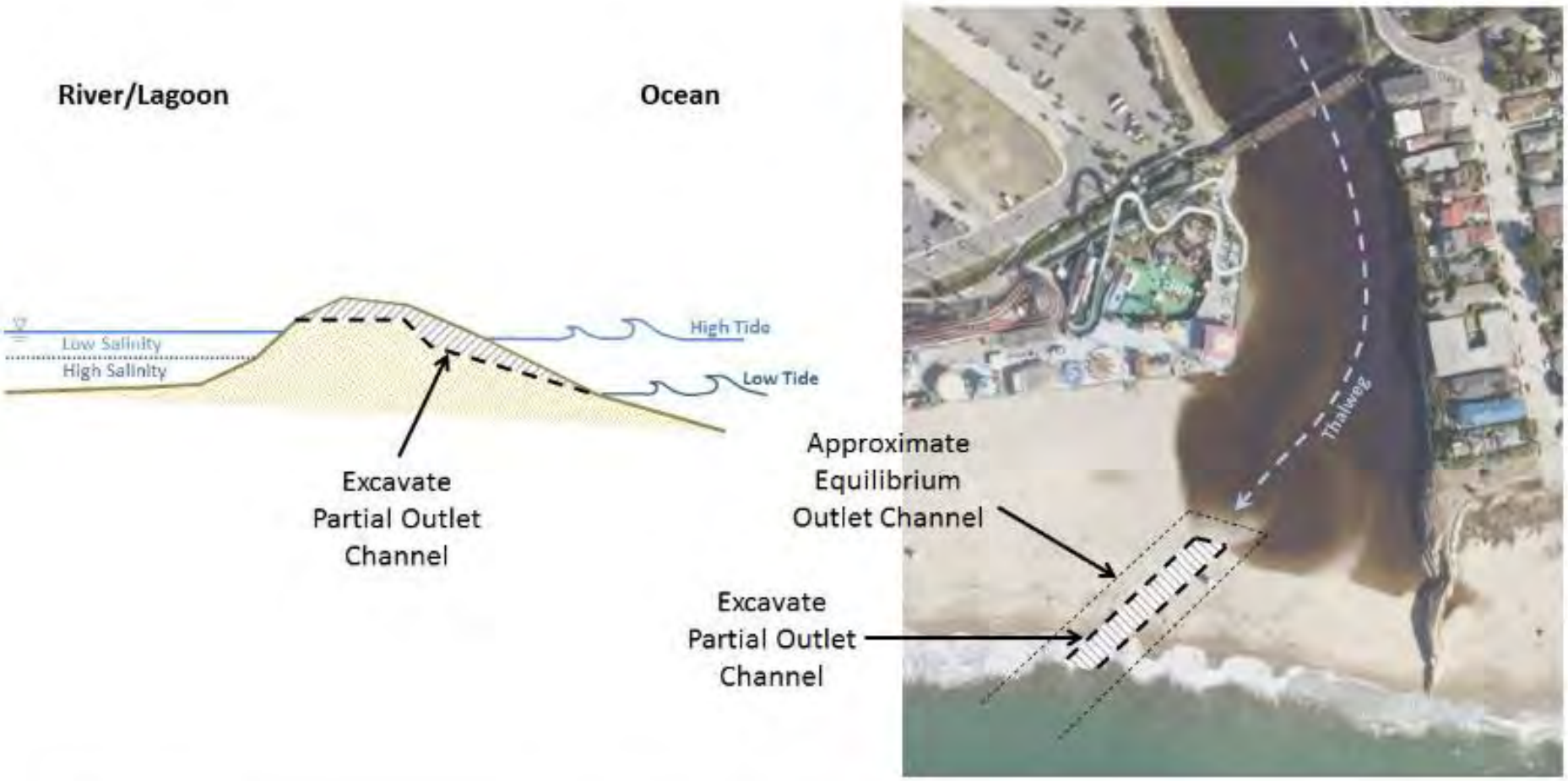


Partial Outlet Channel

SOURCE: D.Revell

San Lorenzo Geomorphic and Engineering Channel Feasibility Study . DW00991.00

Figure 5

Channel grading on September 27, 2014

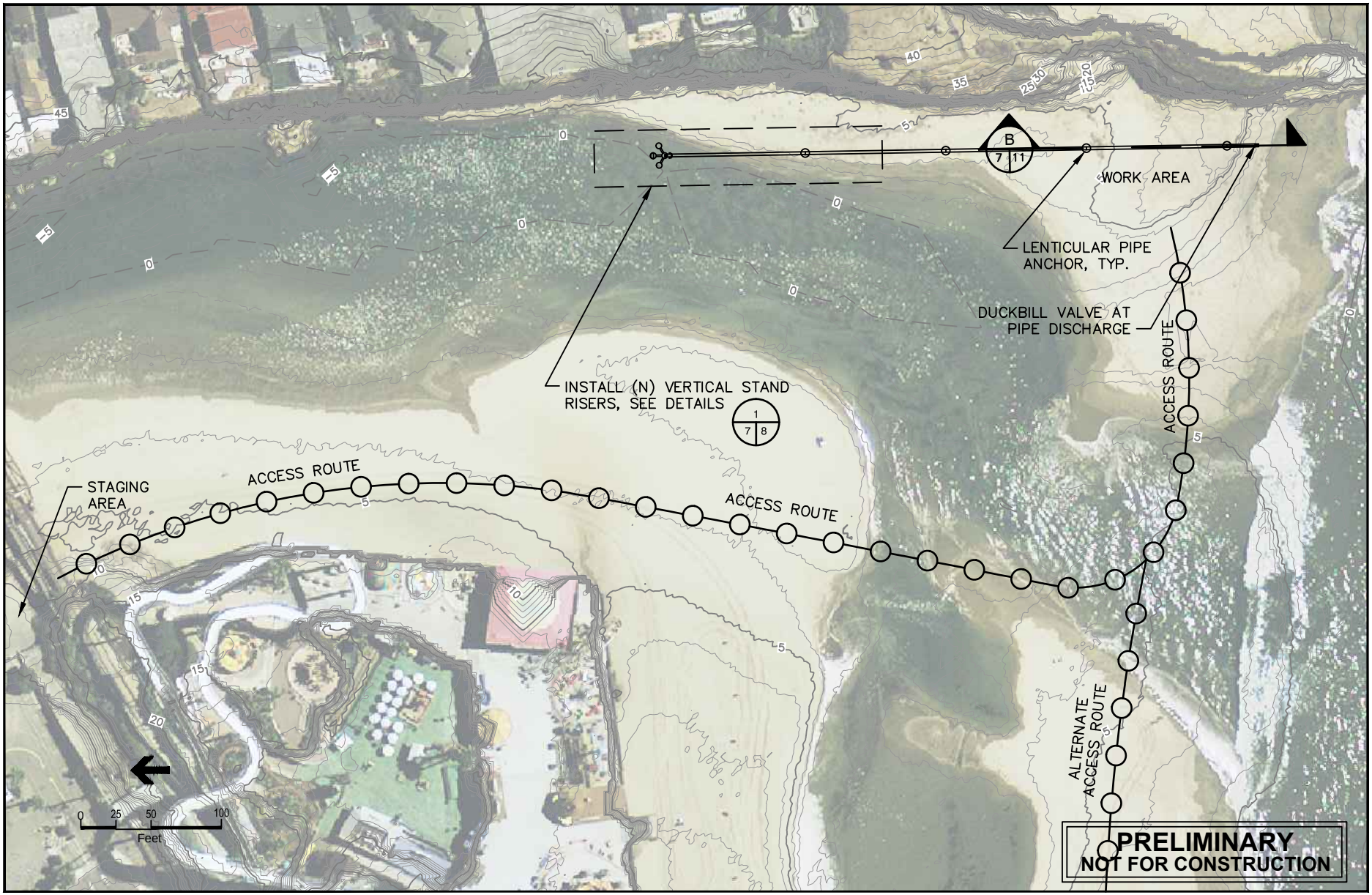
Exhibit 3
3-15-0144
2 of 8

SOURCE: D.Revell

San Lorenzo Geomorphic and Engineering Channel Feasibility Study . DW00991.00

Figure 6

Sand peninsula placed near the outlet channel on September 27, 2014



SOURCE: NOAA (Imagery); CA Coastal Conservancy (LiDAR - 2010); Bathymetry based on survey by Waterways Consulting
NOTES: Vertical datum in feet NGVD

ESA

San Lorenzo Lagoon Interim Management Program . DW0991.00

Figure 7
Site Plan
Culvert Option 1

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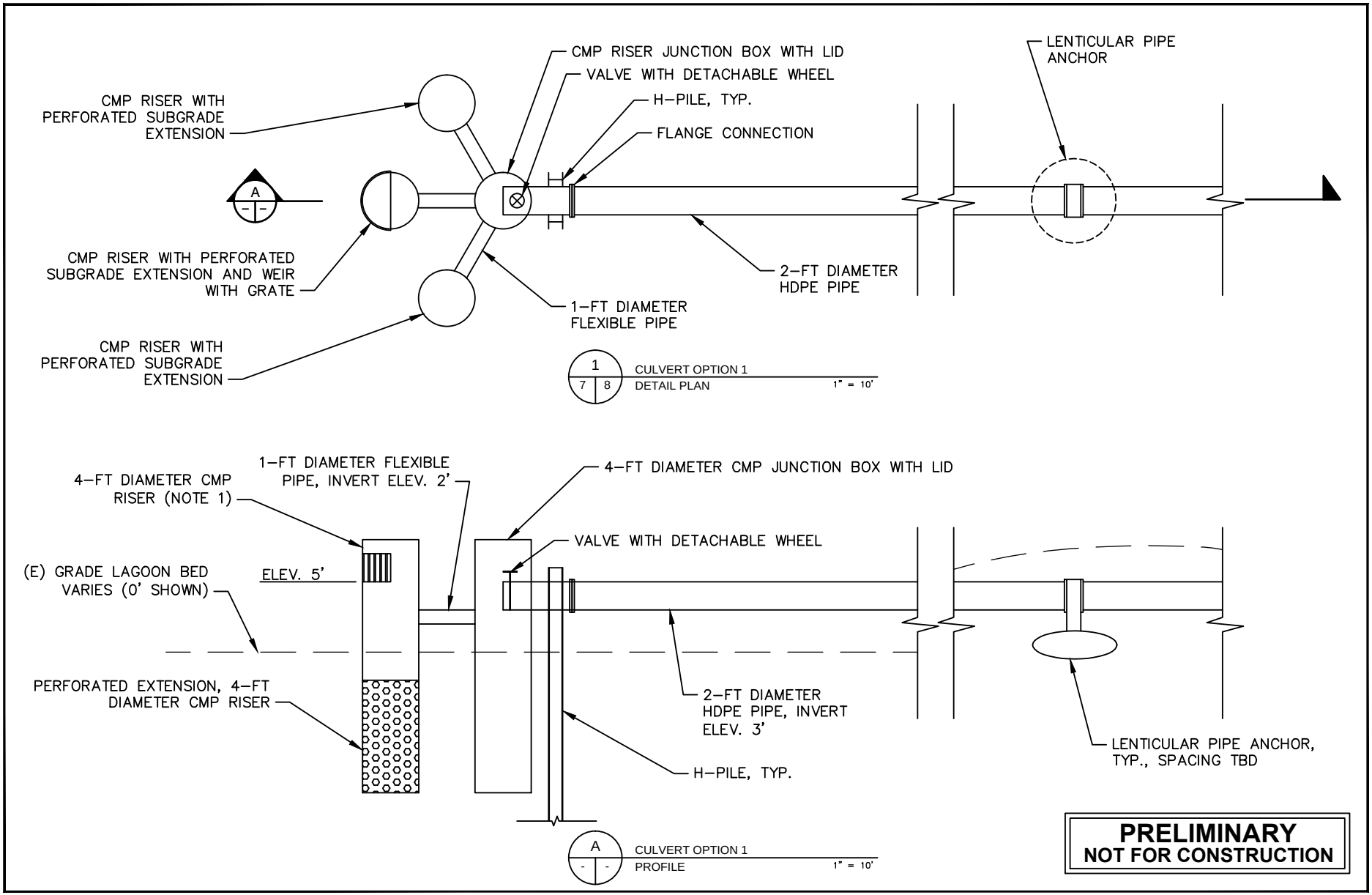
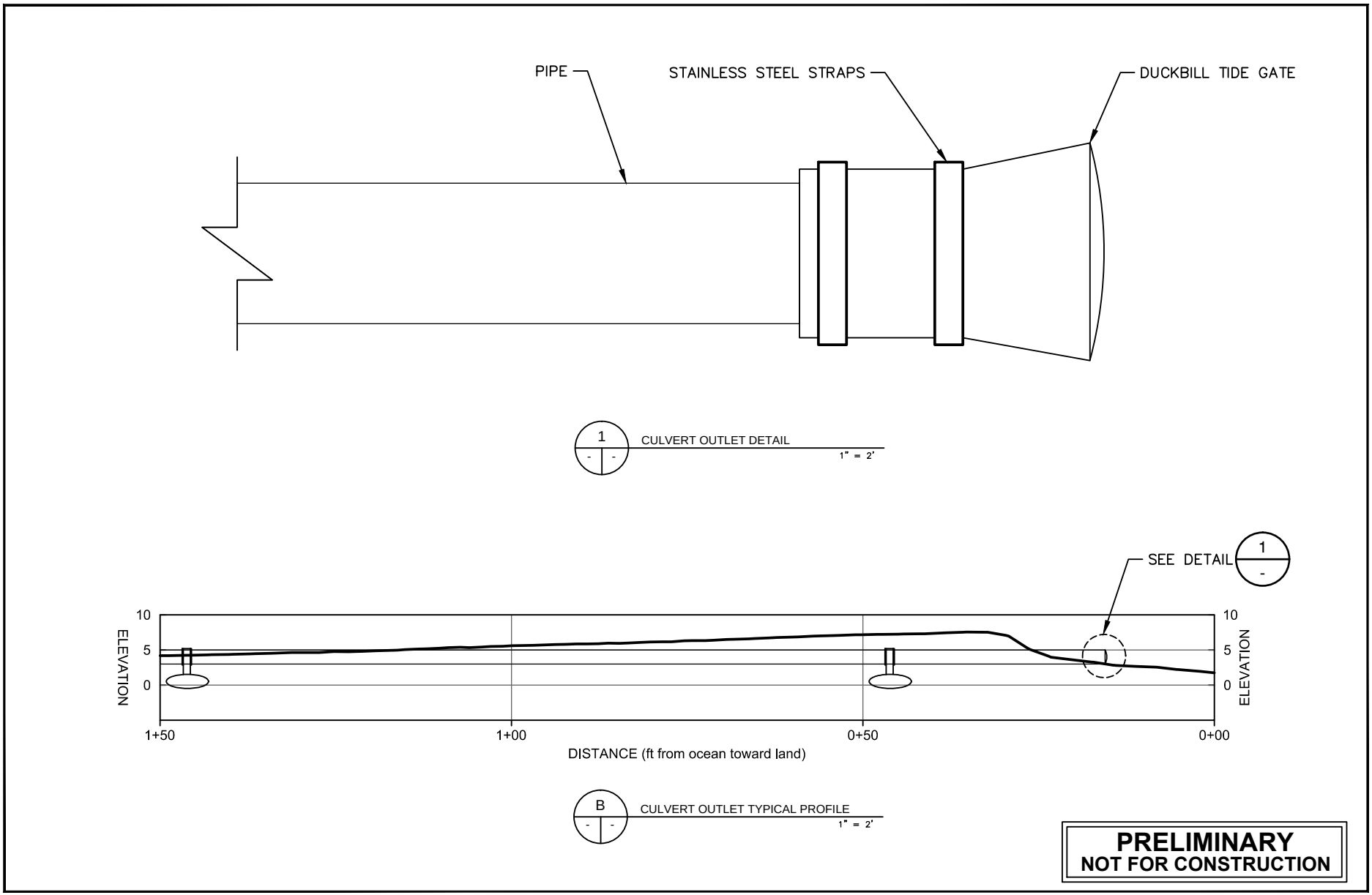


NOTES: 1. One CMP riser shall have a weir with grating to allow surface water inflows for WSE greater than 5'
2. Elevations in feet NGVD

Figure 8
Detail Plan and Profile
Culvert Option 1

Exhibit 3
3-15-0144
5 of 8



SOURCE: CA Coastal Conservancy (LIDAR - 2010)
NOTES: Vertical datum in feet NGVD

Figure 11
Culvert Outlet Schematic

ESA

SOURCE: photographs taken by B. Battalio and D. Revell

San Lorenzo Geomorphic and Engineering Channel Feasibility Study . DW00991.00

Figure 12

Examples of duckbill valves at several northern California beaches

SOURCE: D.Revell

Figure 13
Existing trench in San Lorenzo Point.

CITY OF SANTA CRUZ

OFFICE OF THE CITY MANAGER

809 Center Street, Room 10, Santa Cruz, CA 95060 • (831) 420-5010 • Fax: (831) 420-5011 • www.cityofsantacruz.com

June 11, 2015

Mr. Ryan Moroney
Coastal Planner
California Coastal Commission
Central Coast District Office
725 Front Street, Suite 300
Santa Cruz, CA 95060

Dear Mr. Moroney:

This letter is in response to your request for additional information regarding actual and potential damages associated with the flooding, which results from stagnate high waters when the San Lorenzo River Lagoon is closed during the summer months. Following is a summary of actual and potential damages based upon our understanding of impacts to City infrastructure and private infrastructure in the adjacent areas of the lagoon.

San Lorenzo Boulevard

San Lorenzo Boulevard, which runs parallel with the lower river, experiences weeping (water seeping up through the pavement or ground surfaces) soon after the closed lagoon elevation reaches five feet on the Trestle Bridge gauge. This continuous weeping from the pavement and ground impacts the roadway and traffic signal electrical boxes and overall creates unsafe conditions for the public. According to staff from the Public Works Department's Operations Division, over the past several years the City has expended $80,000 annually in inspection, temporary maintenance, and general cleanup of San Lorenzo Blvd. as a direct result of the sustained high waters in the lagoon. Photos submitted previously to the Coastal Commission via the permit application depict the road and sidewalk damage that results from the flooding.

Levee Pump Stations

The levee has five pump stations with a total of twelve pumps that circulate water once it reaches an elevation of five feet at the Trestle Bridge. As a result of the sustained high waters in the

summer months during long lagoon closures, the pumps run continuously until the lagoon elevation lowers through a breach. Continuous running wears down the pumps, requiring extensive maintenance and repair. According to the manager of the levee, two of the largest pumps required a rebuild at the cost of $66,000. The remaining pumps will be evaluated this year, and the City is anticipating another $100,000 in rebuild costs. It is estimated that the summer high waters account for over 50 percent of these damages, as the pumps run continuously in closed conditions and only sporadically during winter and early spring months. If the elevation exceeds six feet and beyond over a sustained period of time, like in the summer of 2014, those rebuilds and repairs will be needed more frequently, at a higher cost to the City.

Private Infrastructure

Aside from the expenses already incurred by the City to repair damaged infrastructure, private residents and businesses are also impacted by the weeping. Attached is a map which shows the adjacent area that is prone to weeping at sustained lagoon elevations above five feet. The City has received calls from residents whose property have taken on significant water in their basements and yards. Additionally, business owners in Downtown Santa Cruz have submitted photos of their basements taking on water from the lagoon. In the more extreme scenarios, property owners may incur costs as small as $300 to pump water out of their basements to as much as $3,000 to repair foundational problems that result from weeping.

Finally, the Seaside Company has provided the Coastal Commission with information about weeping impacts on its operations at the Santa Cruz Beach Boardwalk. The Seaside Company has expended nearly $300,000 to add pumping capacity and secure its outer walls to better secure its basements from flooding.

In total, the fiscal impacts to the City and community resulting from sustained high waters on the San Lorenzo may exceed $200,000–$300,000. The Interim Management Program provides two management activities that should significantly reduce these actual and potential damages and financial impacts.

Sincerely,

Mark Dettle
Public Works Director

Attachment: Map

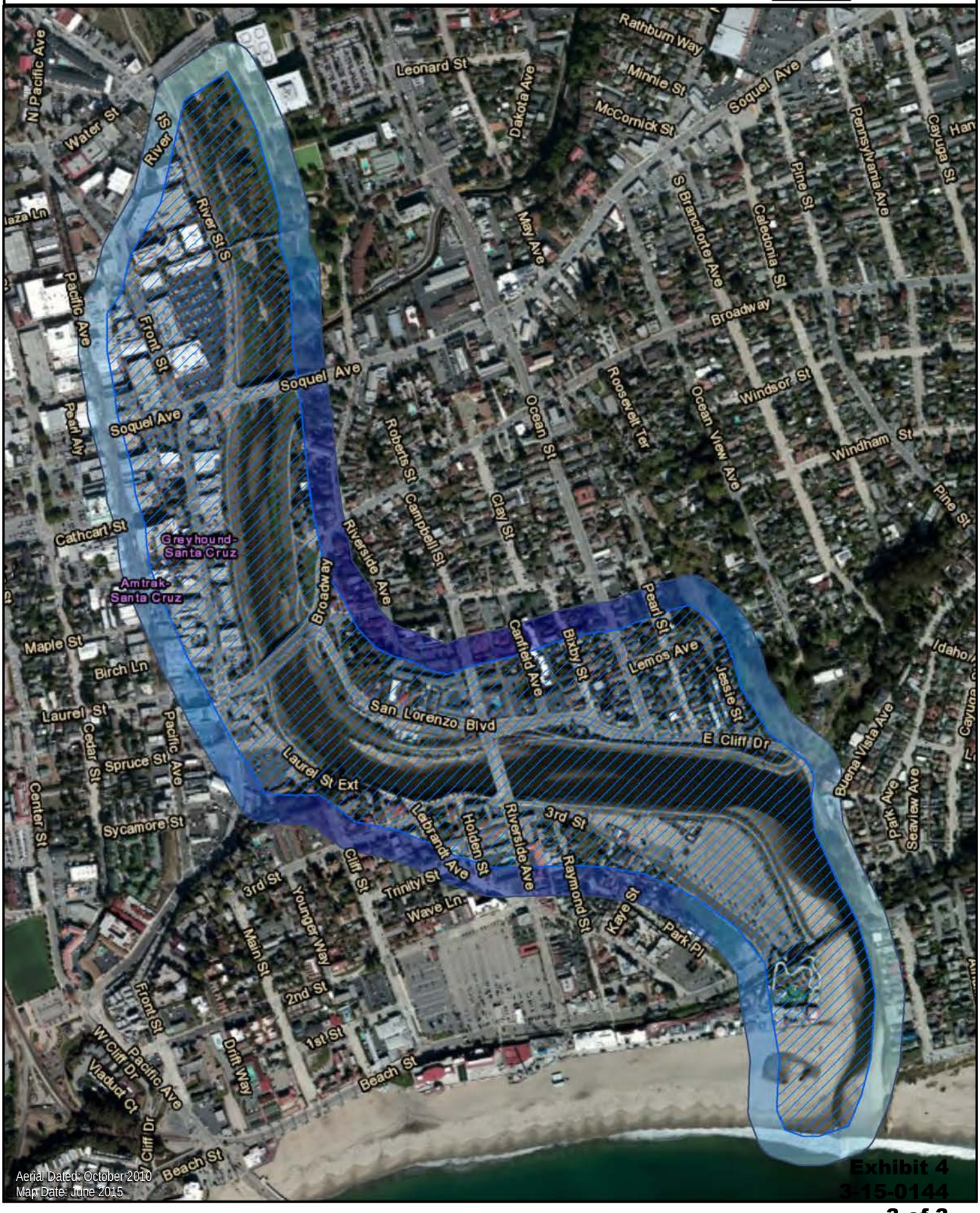
cc: Scott Collins, Assistant to the City Manager

P:\CMAD\Word(Wpfiles)\SUZANNEU\Collins\Letters\Moroney Public Works.docx

Areas Susceptible to Groundwater Flooding
Locations Adjacent to the San Lorenzo River

Approximate Area of Groundwater Flooding

0 125 250 500 Feet



Aerial Dated: October 2010
Map Date: June 2015

Exhibit 4
3-15-0144

State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

May 1, 2015

Mr. Scott Collins
City of Santa Cruz
809 Center Street, Room 10
Santa Cruz, CA 95060

Dear Mr. Collins:

Subject: San Lorenzo River Lagoon Interim Management Program Project, Initial Study/Mitigated Negative Declaration, SCH #2015042002, Santa Cruz County

The California Department of Fish and Wildlife (CDFW) has reviewed the Initial Study/Mitigated Negative Declaration (IS/MND) for the San Lorenzo River Lagoon Interim Management Program Project (Project). CDFW is submitting comments on the IS/MND as a means to inform the City of Santa Cruz (City), as the Lead Agency, of our concerns regarding potentially significant impacts to biological resources associated with the proposed Project and to provide recommendations on additional information to be included in a revised Final MND.

CDFW is a Trustee Agency pursuant to the California Environmental Quality Act (CEQA) § 15386 with responsibility under CEQA for commenting on projects that could affect biological resources. As Trustee for the state's fish and wildlife resources, CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and their habitat for the benefit and use by the people of California. CDFW also acts as a Responsible Agency pursuant to CEQA § 15381 based on its discretionary authority regarding Project activities that impact streams and lakes (Fish and Game Code §§ 1600 – 1616), or result in the "take" of any species listed as candidate, threatened, or endangered pursuant to the California Endangered Species Act (CESA, Fish and Game Code, § 2050 et seq.).

Project Location and Description

The Project is located on the San Lorenzo River extending from the confluence with the Pacific Ocean for approximately 700 feet upstream within the limits of the City of Santa Cruz. The Project proposes to prevent unauthorized river lagoon breaching and control water surface elevation (WSE) of the lagoon that forms at the mouth of the San Lorenzo River to an elevation of 5.0 feet using the National Geodetic Vertical Datum of 1929 to prevent localized flooding to public and private properties and infrastructure. The Project is designed to be an adaptive management program for addressing activities related to fisheries habitat, flooding, and public access and safety where the river mouth empties at Santa Cruz Main Beach. The Project includes two primary management activities to be implemented during the proposed three-year management period of 2015 through 2017 between May 1 and November 15. The two management activities include installation of a

temporary outlet channel that would be implemented each year in 2015 and 2016, and a head driven culvert (also considered temporary) that would be implemented in 2016 (if funding is secured) and 2017.

The temporary outlet channel would consist of a controlled drawdown of the lagoon WSE to prevent water from reaching the 5.0 foot elevations. The temporary outlet channel will be constructed up to six times during the season as needed to draw the lagoon down to 3.0 to 4.0 feet, and then the channel will be closed. Construction and closure of the each temporary outlet channel would take place within a one day period. Typical channel dimensions would be on the order of 35 to 50 feet in width and 75 feet in length. The head driven culvert (culvert) will allow the lagoon elevation to reach 5.0 feet under normal river mouth closure conditions and then maintain that elevation through passive removal of water from the lagoon via overflow of surface waters through a small weir and infiltration through the barrier sandbar as an additional contribution. A series of three 4-foot diameter standpipes (risers) would be partially buried in the lagoon adjacent to San Lorenzo Point, and would be connected to a 450-foot horizontal culvert buried in the beach connecting the lagoon to the ocean. It is estimated the culvert could be constructed in less than two weeks.

Comments on Project Description

The IS/MND, under *Background: History of Flooding and Lagoon Breaching*, describes the facilities and infrastructure subject to flooding such as the Santa Cruz Beach Boardwalk (Boardwalk), residential streets, and the levee and drainage system. However, this section of the IS/MND does not adequately quantify or relate the extent of flooding to lagoon WSE. For example, the capacity of the existing levee and drainage facilities to accommodate and alleviate flooding is not clearly described. It is CDFW's understanding that the basement of the Boardwalk has been the first infrastructure to flood as lagoon WSE begins to rise. Recently, the Boardwalk upgraded its facilities to fortify them against flooding potentials that would begin to occur when the San Lorenzo River Lagoon reached a WSE of 5.5 feet. Any recent improvements in nearby infrastructure to protect against flooding should be clearly described and analyzed in the MND.

CDFW recommends the MND be revised to evaluate the feasibility and effectiveness of improvements to the City's storm drain system and levee drainage systems for the purpose of maintaining a higher WSE and reducing impacts associated with a reduced lagoon volume on special-status species within the lagoon.

The IS/MND states that the preparation of plans for the Project included a series of meetings with the state and federal resource agencies that included identifying management alternatives and that the final alternatives were identified as the Project's proposed management activities. However, limited discussions between CDFW and the City have occurred in regards to lowering the WSE to less than 5.0 feet or reductions to the temporary channel outlet dimensions, and during those discussions, CDFW expressed concerns with these activities. During these resource agency meetings, CDFW advised the City that in order to reduce impacts to special-status fish species, the 5.0-foot was the point

at which no further reductions to WSE should occur. CDFW also indicated that temporary channel outlets should be constructed of dimensions in a manner to reduce the probability of uncontrollable lagoon draining events. Furthermore, an emergency permit issued by another agency for emergency mechanical breaching of the San Lorenzo River lagoon in September 2014 also addressed these concerns and included several special conditions, including one to ensure that the lagoon did not dewater below five feet. Therefore, as previously discussed with the City, CDFW recommends that the proposed Project, as part of the three-year management plan, specifies that the channel will be excavated at an angle from the shallowest part of the lagoon and face the appropriate wave-action direction to aid in re-closure, and will be at a minimum width of 10 feet, maximum depth of 2 feet, and length of 250-1,000 feet to minimize slope and outflow velocity and reduce the rate of lagoon drainage and risk of channel scour. Additionally, CDFW recommends the Project specify that channel excavation will retain a lagoon WSE of 5.0 feet as measured at the train trestle bridge staff gage.

Additionally, this section of the IS/MND (Page 5) states that the resource agencies and the City agreed to four objectives. To clarify, identification of overriding considerations for emergency actions (Objective 4) was not an objective to which CDFW agreed since flooding issues related to the WSE in the San Lorenzo River Lagoon are predictable and foreseeable.

Biological Resources

The IS/MND states that the San Lorenzo River Lagoon typically experiences intermittent "open" conditions (i.e. technically an estuary and not a lagoon) throughout the summer but does not discuss or evaluate the extent to which past illegal breaching has influenced this intermittent transition from a lagoon to an estuary throughout the summer season. The IS/MND discusses water quality impacts of extended lagoon closures based on data that may have been taken from one geographic location and sampled from the surface and bottommost points in the water column. This sampling protocol would not be representative of the entire lagoon throughout its extent nor of the entire water column. CDFW has concerns as to whether data have been extrapolated beyond a reasonable scope and whether any analyses of lagoon water quality data have accounted for time-interdependency of samples and freshwater inflow. In addition, the Biological Assessment (Attachment 2 of the IS/MND) heavily references an analyses that has not been finalized due to potential flaws in study design and data analyses (i.e. *Comparative Lagoon Ecological Assessment Project (CLEAP) Santa Cruz County, California, 2006 Draft Final Report*). CDFW recommends that the IS/MND either strike these sections from the IS/MND and Biological Assessment or include sections on sampling design, sampling locations, sampling depths, timing of sampling, methodologies used for statistical analyses and goodness of fit testing (if applicable) and results from statistical analyses. CDFW also recommends (as discussed during past meetings with the City) that analyses and interpretation of lagoon water quality data would benefit from review by the National Marine Fisheries Service (NMFS) staff and/or other non-private experts in lagoon water quality dynamics.

The IS/MND includes information on observed stranding and mortality of tidewater goby (*Eucyclogobius newberryi*) during the controlled breach for WSE drawdown that occurred in September 2014, and states that the San Lorenzo River lagoon encompasses 66 acres of habitat for the species. The IS/MND also concludes that habitat for the tidewater goby will not be adversely impacted but that indirect impacts may occur within the Project construction area. Tidewater goby is listed as endangered under the federal Endangered Species Act (ESA) and is a State Species of Special Concern. CDFW recommends that the impacts analysis on tidewater goby include loss of habitat by quantifying the changes in areal extent of inundated habitat at various lagoon WSE levels and that the IS/MND be revised to include compensatory mitigation measures to offset mortalities and loss of habitat for tidewater gobies.

The IS/MND indicates that steelhead (*Oncorhynchus mykiss*) and coho salmon (*Oncorhynchus kisutch*) may be present within the Project area, and that the Project may not be able to completely avoid impacts to steelhead and coho habitat. Central California Coast Evolutionarily Significant Unit coho salmon (hereafter coho) is listed as endangered under CESA and ESA. Central California Coast Distinct Population Segment of steelhead (DPS; hereafter steelhead) is listed as threatened under ESA and designated as a State Species of Special Concern. The IS/MND states that steelhead appear to prefer areas of the San Lorenzo River Lagoon that have deeper water relative to the rest of the lagoon and that they probably avoid the shallower depths to avoid predation by birds and to find areas with preferred cover and environmental parameters.

CDFW recommends that the IS/MND be revised to include an evaluation of impacts to fisheries resources, including:

1) the relationship between reducing lagoon depths to the various proposed WSE levels and the ability of steelhead and coho to avoid avian and mammalian predators;
2) the relationship between reducing lagoon depths to the proposed 3.0-foot WSE elevations and impacts to freshwater and lagoon volumes;
3) the relationships between expected increases in solar radiation and temperatures throughout the lagoon's extent and steelhead rearing habitat; and
4) compensatory mitigation measures to offset impacts from loss of habitat and cover from avian predators (e.g., seasonal installation of completely submerged cover structures for fish that span the majority of the water column).

CDFW recommends that the IS/MND be revised to include the methodologies to be used for monitoring of fish stranding during drawdown of WSE, and a complete mitigation, monitoring and reporting program. The mitigation, monitoring and reporting program should include the following:

1) an evaluation of the volume of habitat conditions in the lagoon from data collected in multiple locations at intervals of 0.25-meter depths throughout the water column to evaluate lagoon water quality dynamics and evaluation of lagoon stratification;

2) measures to evaluate direct Project impacts to fish;
3) the number of qualified biologists to be used during activities associated with temporary outlet channel construction;
4) avoidance, minimization and mitigation measures to be implemented for the different types of impacts identified; and
5) effectiveness evaluations of the Project's avoidance, minimization and mitigation measures.

If surveys or monitoring indicate that coho are present at the Project site and take of the species cannot be avoided, then please be advised that an Incidental Take Permit (ITP), pursuant to Fish and Game Code § 2080 *et seq.* must be obtained if a project has the potential to result in take of species of plants or animals listed under CESA, either during construction or over the life of the project. Issuance of an ITP is subject to CEQA documentation and analysis. Therefore, the IS/MND must specify impacts, mitigation measures, and a mitigation, monitoring and reporting program. If the Project will impact CESA-listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain an ITP.

Conclusion

CDFW appreciates the opportunity to provide comments on the IS/MND for the subject Project. If you have any questions, please contact Ms. Melissa Farinha, Environmental Scientist, at (707) 944-5579; or Ms. Brenda Blinn, Senior Environmental Scientist (Supervisory), at (707) 944-5541.

Sincerely,

Scott Wilson

Scott Wilson
Regional Manager
Bay Delta Region

cc:
State Clearinghouse
Kim Sanders, Regional Water Quality Control Board – kim.sanders@waterboards.ca.gov
Jacob Martin, U.S. Fish and Wildlife Service – jacob.martin@fws.gov
Joel Casagrande, National Marine Fisheries Service – joel.casagrande@noaa.gov
Gregory Brown, United States Army Corps of Engineers – gregory.g.brown@usace.army.mil
Susan Craig, California Coastal Commission – susan.craig@coastal.ca.gov
Ryan Maroney, California Coastal Commission – ryan.maroney@coastal.ca.gov
Captain Don Kelly, CDFW Law Enforcement Division

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

May 1, 2015 **Refer to NMFS No:** 151422WCR2015SR00137

Scott Collins
City of Santa Cruz
Office of the City Manager
809 Center Street, Room 10
Santa Cruz, California 95060

Submitted electronically to SCollins@cityofsantacruz.com

Dear Mr. Collins:

Thank you and the City of Santa Cruz (City) for the opportunity to comment on the City's March 2015 Mitigated Negative Declaration (MND) for the *San Lorenzo River Lagoon Interim Management Program* (IMP) at the San Lorenzo River Mouth in the City of Santa Cruz. NOAA's National Marine Fisheries Service (NMFS) has reviewed the MND materials received on April 23, 2015. According to the MND, the City is considering the proposed IMP as a means to address longstanding conflicts related to federally listed species, their habitat, flooding, as well as public access and safety. The IMP includes two management activities to be implemented during the proposed three-year management period of 2015 through 2017: 1) a temporary lagoon outlet channel that would be constructed in 2015 and 2016; and 2) installation of a Head Driven Culvert that would be implemented in 2016 (if funding is secured) and in 2017.

Federally endangered Central California Coast Evolutionarily Significant Unit coho salmon (Oncorhynchus kisutch) and federally threatened Central California Coast Distinct Population Segment steelhead (O. mykiss) occur or have the potential to occur within the San Lorenzo River Lagoon. Additionally, designated critical habitat for both of these listed species occurs within the proposed project reach. The site also supports Essential Fish Habitat (EFH) for various life stages of fish managed under the Pacific Coast Groundfish Fishery Management Plan (FMP), Coastal Pelagic Species FMP, and the Pacific Coast Salmon FMP, pursuant to section 305(b) of the Magnuson-Stevens Fisheries Conservation and Management Act (MSA). Given these sensitive public trust resources, NMFS expects the proposed project will be designed in such a way as to avoid, minimize, and mitigate impacts to ESA listed species, their designated critical habitat, and EFH, and, if possible, improve existing conditions for these resources. Depending on the project design and methods used for construction and implementation, consultation with the designated federal action agency pursuant to section 7 of the ESA, as amended (16 U.S.C. 1531 et seq.) and EFH consultation pursuant to the MSA would be expected. Listed below are NMFS' comments regarding the MND.

Water surface elevation management

- Due to serious concerns regarding the quality and quantity of steelhead rearing habitat in the San Lorenzo River Lagoon, NMFS recommends the City manage the lagoon at a water surface elevation (WSE) of at least five feet (ft) NGVD29[1]. It is NMFS' understanding that during net freshwater inflow of less than three cubic feet per second (cfs), the IMP would maintain the lagoon WSE at a depth of three ft. The lagoon WSE would only increase once net freshwater flow increases above three cfs. However, considering California's current drought conditions, there is concern that net freshwater inflow may drop below three cfs for extended periods of time, resulting in a WSE that would likely persist at three ft or lower. Further, the rationale for an outflow pipe with an elevation of three ft was not clearly described in the MND. Due to the potential benefits to steelhead and their habitat by increasing the lagoon WSE to five ft or more, we recommend that an analysis be provided that explores an increased WSE and decreased head difference.

- The MND states flooding occurs when the lagoon WSE is above five ft, but does not provide exact flood stage elevations for local infrastructure. The MND states that Boardwalk facilities have been flood-proofed (new pumps, resealing below-grade, and above-grade seawall), but a WSE where flooding now occurs at the Boardwalk or other City or federal facilities (*e.g.*, levees) is not given. The MND does mention the pump system at the levees starts at approximately four ft, storm drain and basements flood higher than five ft, and the theatre floods at seven ft. Therefore, it is unclear whether or not the lagoon could be managed at an elevation potentially greater than five ft, such as 5.5, 6.0 or 6.5 ft. Higher elevations would increase the extent and quality of steelhead rearing habitat (*i.e.*, increased depth) while potentially avoiding flooding of local infrastructure.

Freshwater conversion and manual valve operation

- The Head Driven Culvert may increase the amount of time to fill the lagoon to a WSE of 5 ft, which could adversely affect the quantity and quality of critical habitat for rearing juvenile steelhead and coho salmon. While NMFS supports the concept of the Head Driven Culvert, how it is operated with respect to WSE and water quality is of concern. Ideally, after the sandbar closes from a tidally-influenced configuration, the lagoon would fill with freshwater to five ft as quick as possible. The report provided with the MND (Geomorphic and Engineering Channel Feasibility Study[2]) calculates the average time to fill the lagoon during the dry season when the Head Driven Culvert would be operational. Under normal conditions the report states that starting from a WSE of three ft, it would take approximately six days to reach five ft. Alternatively,

[1] All water surface elevation levels discussed hereafter refer to the National Geodetic Vertical Datum of 1929 (NGVD29).

[2] ESA. 2015. "San Lorenzo River Lagoon Interim Management Program: Geomorphic and Engineering Channel Feasibility Study." Prepared for the City of Santa Cruz, January 2015.

the MND estimates that it would take approximately two to three weeks to reach five ft if the bottom risers of the Head Driven Culvert were operational (outflow approximately three cfs). NMFS recommends operation of a manually operated valve, combined with continuous water quality monitoring, to achieve relatively rapid filling of the lagoon to a maximum WSE while concurrently minimizing the duration and extent of water column stratification. For example, once the lagoon WSE reaches just under five ft, NMFS recommends that the trapped saltwater on the bottom of the lagoon be released through the Head Driven Culvert system by way of the perforated bottoms of the standing risers and a valve located on the horizontal drain pipe.

- The MND mentions a manual valve on the Head Driven Culvert that could be closed and opened, although a detailed description of the valve and its operation are lacking in the MND and associated documents. NMFS recommends the City provides a detailed description of the manual valve and its proposed operation.

- During drought conditions with a net freshwater inflow less than three cfs, the MND and associated documents state that the lagoon WSE would be maintained at three ft. It is the stated objective of the MND to manage the lagoon at a minimum of five ft, thus NMFS recommends the City implement a formal management plan for the manual valve(s). For the benefit of steelhead and other species, NMFS recommends the valve be closed or partially closed when needed to maintain the lagoon WSE at five ft and decrease stratification. We also recommend the City design a water quality monitoring program (or augment existing programs) to assess their valve operations.

Installation, demobilization, and salmonid migration

- According to the MND, installation of the culvert may occur in the spring after flood flows have subsided, but while flows are still high enough to keep the mouth open (20 cfs or more, typically before July 1). If this occurs, Mitigation Measure 2 states that the valve will remain closed (not in operation) until the City has decided that the first seasonal longer-term closure has started and the steelhead and coho salmon migration period to the ocean has ended. The MND states that this typically happens after July 1, but the date may vary depending on how dry the year is. It is unclear in the MND (pg.45) if the intermittent sandbar openings in spring are expected to be natural or due to the construction of a Temporary Outlet Channel. NMFS recommends the City clarify the cause of these intermittent sandbar openings (*i.e.*, Temporary Outlet Channel construction, or natural sandbar breach, or both). In addition, NMFS recommends the City provide information about the maximum rate of flow out of the Head Driven Culvert in order to determine the need for a Temporary Outlet Channel during Culvert operation (*i.e.*, what is the maximum rate flow (cfs) the horizontal discharge pipe can convey to the ocean?).

- The MND states that the demobilization and installation procedures of the Head Driven Culvert will be similar and will take approximately two weeks. Demobilization may occur in October or November, prior to the first major rainfall events, if practicable,

and installation may occur before July 1, as previously discussed. Although the timing of demobilization and installation and equipment best management practices (in the MND, Table 2) are intended to reduce impacts to coho salmon and steelhead, it is not clear whether or not the demobilization and installation activities during the construction periods will impact salmonid migration. NMFS recommends specific measures be designed and implemented for the demobilization and installation construction periods to avoid and or minimize any delay to salmonid migration.

NMFS appreciates the opportunity to comment on the MND and recommends the City continue to coordinate with us during the development of the project design. Please contact Joel Casagrande at (707) 575-6016, or joel.casagrande@noaa.gov, or Brian Meux at (707) 575-1253, or brian.meux@noaa.gov, if you have questions regarding these comments.

Sincerely,

for

Alecia Van Atta
Acting Assistant Regional Administrator
California Coastal Office

Copy to ARN File: 151422WCR2015SR00137
Copy to Chron File

(3) Flooding in basements of buildings along Pacific Avenue in Santa Cruz. The City of Santa Cruz received reports of flooding in basements of buildings along Pacific Avenue in Santa Cruz on September 14, 2014. Del Mar Theater photos show this effect.

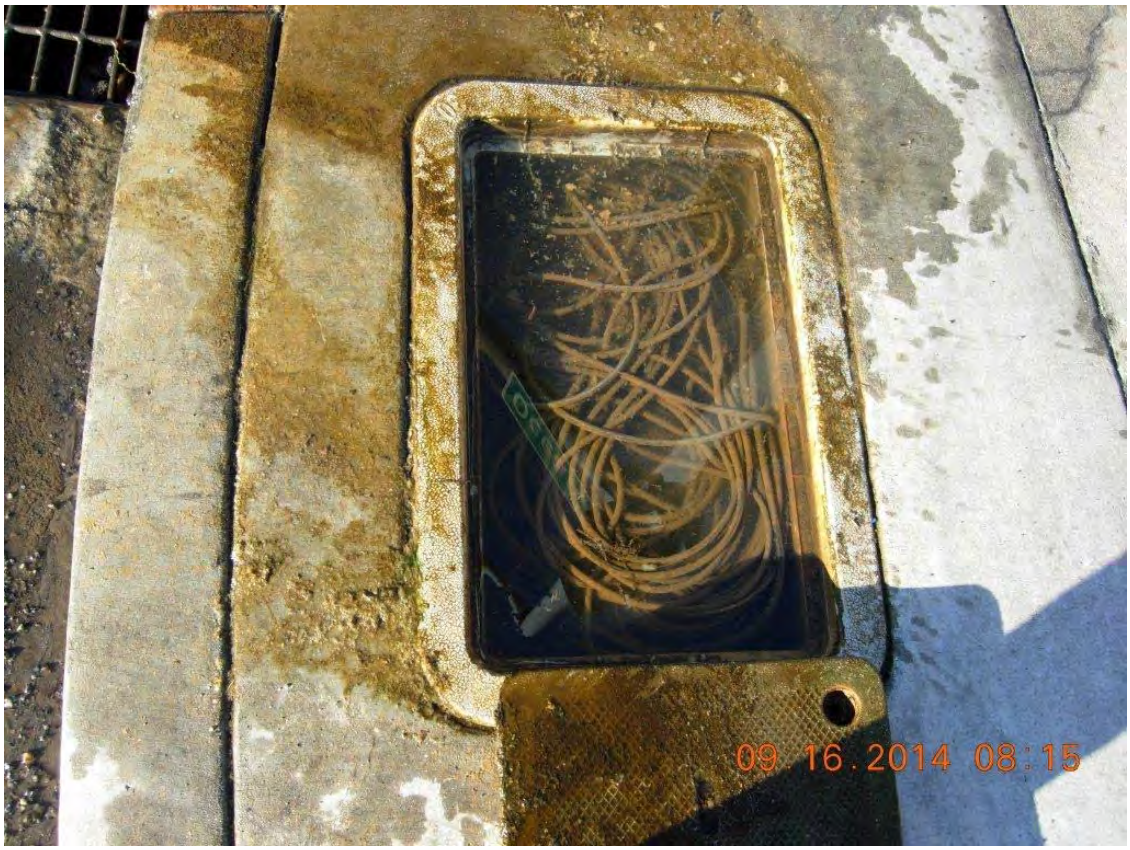


Photo 1: Flooded Electrical Box

Photo 2: Del Mar Theater Basement flooding

Photo 3: Del Mar Theater ground floor flooding

Photo 4: Del Mar Theater storage area flooding

Additional land use conflicts with closed lagoon conditions include public access and safety for Santa Cruz Main Beach, an area visited by over 3 million people annually. Under closed conditions as described above, a spillover channel does eventually form and bifurcates the beach in a westerly direction (Figures 6 and 7). This can make lifeguard access to the ocean edge difficult and hazardous. The spillover channel is also attractive to inexperienced swimmers who wish to avoid the ocean and can have marginal water quality conditions as well as an uneven bottom and depth. These are additional concerns for City lifeguards.

A history of unauthorized and emergency breaching has been documented at the river mouth due to a variety of factors including the heavily populated beach and issues with flooding in the surrounding developed area around the river mouth. The river mouth is also known as a prime surfing location when sediments from the river mouth deposit offshore and south swells come in the summer months. These favorable surfing conditions have allegedly resulted in illicit barrier beach manipulation by surfers to encourage sediment transfer onto the sandbar at the river mouth (see Figure 8). All these circumstances have led to unauthorized breaches of the sandbar during the spring and summer, which adversely effect habitat conditions for species that utilize the lagoon, especially anadromous species.

Photo 5: River water saturating Riverside Drive pavement and San Lorenzo River bikeway flooding, 2014. Photos by Revell Coastal.

Photo 6: Ground saturation

Photo 7: Flooded bike path at river

MITIGATION MONITORING PROGRAM - San Lorenzo River Lagoon Interim Management Plan

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements & Verification of Compliance
Biological Resources				
MITIGATION MEASURE 1: Avoid construction activities in the wetted areas of the lagoon, and implement fish survey prior to installation of the temporary outlet channel or head driven culvert, collect any tidewater gobies on the dewatered sandbars and in the outlet channel, and release them in a safe location.	Prior to initiation of channel construction a small mesh seine (10' long by 4' deep by 1/8" mesh) will be used to survey the area that will be disturbed during construction. All monitoring activities will be conducted under the supervision of a biologist possessing a 10(a)1(A) recovery permit from the US Fish and Wildlife Service, specific to the tidewater goby. Any tidewater goby (TWG) present will be removed to a nearby area with water depth of at least 2.0 feet. Captured TWG will be held and transported in 3-5 gallon containers and provided with oxygen if needed. When the channel is completed and the lagoon is draining, biologists will survey the entire lagoon for stranded TWG. Surveys will focus on areas with dewatering sandbars typically found around the mouth, at the bend across from Jesse Street marsh, the east bank upstream of Riverside Bridge, Branciforte Flood Control Channel, and the area between Laurel Street and Water Street. Four biologists will be on duty to cover this extensive area and ensure that stranded TWG are recovered before they die or are captured by predators. All TWG found stranded will be enumerated and condition noted (live, injured, deceased, etc.). Live fish will be captured with small aquarium nets. Fish will be held and transported in 3-5	City responsible for hiring qualified biologist to observe and implement mitigation in accordance with specified implementation actions. A report with findings of observed fish and actions undertaken will be submitted to the City Manager's Office, and City staff will transmit the report to all responsible agencies.	During installation of the Temporary Outlet Channel and Head Driven Culvert.	A report of activities will be completed following each channel construction event. The report will include a summary of the activity, timing of events, initial and final lagoon stages, photographs documenting the activity and areas where TWG were captured, photographs of captured individuals, description of areas surveyed, number of fish captured and released, number of mortalities, locations of fish capture, and activity of potential predators of stranded fish.

Exhibit 7
3-15-0144
1 of 7

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements & Verification of Compliance
	gallon containers and provided with oxygen if needed. Fish will be released in water at least 2.0 feet deep in areas unlikely to experience stranding (i.e. with steeper banks). Prior to closure of the temporary outlet channel, the biologists will survey the channel and capture any TWG that may have entered. These fish will be returned to the lagoon and released.			
MITIGATION MEASURE 2: If the head driven culvert is installed prior to July 1st, delay the operation start date (i.e. when the valve is opened) until the City has decided that the first seasonal longer-term closure has started and the steelhead and coho salmon migration period to the ocean has ended. This typically happens after July 1st, but the date may vary depending on how dry the year is. The culvert valve can be closed prior to the first major rainstorm of the year (when natural breaching would have occurred at the end of fall or beginning of winter). This will allow the lagoon to breach normally.	Actions specified in Measure and in the Head Driven Culvert Operation Procedures (ESA, May 9, 2015).	City responsible for monitoring conditions and insuring installation and operations occur within the specified parameters.	During installation of the Head Driven Culvert.	Documentation of date culvert operations started (valve open) and water levels.

Exhibit 7
3-15-0144
2 of 7

ESA

550 Kearny Street
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memorandum

date 5/19/2015

to City of Santa Cruz

from Dane Behrens, PhD, PE; Bob Battalio, PE

subject Proposed Head-Driven Culvert Operation Procedures

1. Introduction

At the request of the City of Santa Cruz, ESA is providing a set of proposed operation procedures for the head-driven culvert alternative outlined in the recent Geomorphic and Engineering Channel Feasibility Study. The goals of this memo are to (1) describe the design objective of the culvert and (2) to list the set of expected operations procedures for the management season.

ESA was hired by the City of Santa Cruz to develop criteria for an interim water level management plan and to provide a preferred channel outlet alternative. This work was funded by the City to support its Interim Management Plan (IMP) for the lagoon. Design of channel alternatives was based on the IMP's goals of reducing the need for artificial breaching, of preventing flooding of low-lying properties, and of providing habitat for aquatic species concurrent with acceptable species habitat.

The head-driven culvert was one of several alternatives initially presented to the City and permitting agencies. Design criteria for all alternatives included:

- Influence to listed species,
- Public safety and liability,
- Cost (annual and over program period),
- CEQA compliance,
- Regulatory viability,
- Ease of implementation (seasonality, length of beach disturbance, construction timeframes, and notification procedures)
- Outflow capacity, and
- Certainty of success.

The alternatives were evaluated based on these criteria with the help of the City and permitting agencies. To address the hydraulic criteria (the two last criteria listed above) ESA developed a water balance model for the lagoon to better understand the amount of flows needed to be exported from the lagoon to maintain the water level near the selected target elevation of 5.0 ft NGVD (ESA 2015). This analysis included freshwater flows into the lagoon, as well as wave overwash, evapotranspiration, pump operations, and seepage losses. It was determined that a minimum of 5 cfs would need to be passed by the preferred alternative to maintain a lagoon elevation around the target elevation under typical later summer flow conditions.

2. Design Objective

The primary objective of the head-driven culvert is to maintain a perched lagoon water surface elevation close to the target elevation, selected to be 5.0 ft NGVD, during the management season. An additional objective is to increase freshwater habitat in the lagoon by encouraging passive export of trapped saltwater from the lagoon.

These objectives were shaped in part by insights gained from City data collected in the lagoon from 2003-2013. ESA's Coastal Processes and Data Integration Report (ESA 2014) examined these data in detail, and provided context by also analyzing concurrent nearshore coastal processes. This report identified several key processes:

- The lagoon mouth closed in all years that data were collected, with closure events lasting from several days to several months. Closure duration is longer when streamflows and wave overwash are minimal.
- Closures are much more common and persistent after streamflows measured at the USGS gage on the San Lorenzo River in Santa Cruz drop below 20 cfs, which usually occurs in June or July. The mouth typically reopens in early winter with the first rainfalls of the year (typically between October and December).
- Saltwater trapped in the lagoon during mouth closure is exported over time, likely due to seepage flows through the beach berm. The rate of export increases for higher lagoon water levels, especially when lagoon stage is consistently above mean higher high water (MHHW).
- Bottom salinity is highest at the time of closure, and declines to brackish surface levels within 2-4 weeks.
- Temperature and dissolved oxygen in bottom waters are adversely influenced by the presence of stagnant saltwater.

The design of the head-driven culvert was shaped based on these observations and the design criteria listed above. The culvert is designed to be fed by seepage flows through the bed of the lagoon. A series of three 4' diameter standpipes (risers) would be partially buried in the lagoon adjacent to San Lorenzo Point, and would be connected to a horizontal culvert buried in the beach connecting the lagoon to the ocean. Lagoon water would seep into the porous bottoms of the risers, feeding flows into the horizontal culvert. A weir is included to maintain the water level near the 5.0 ft NGVD target through surface overflow into the culvert when water levels reach this elevation.

Maintaining the lagoon at this perched elevation and allowing for passive seepage intake is intended to export bottom saltwater from the lagoon, speeding the natural freshening process observed from the 2003-2013 data. The intake through the sand avoids fish and sediment entrainment that might occur if the intakes were located just above the bed. More information about the design of the head driven culvert is available in the Geomorphic and Channel Feasibility Study (ESA 2015).

3. Proposed Operation Procedures

The anticipated culvert system installation and operations are described below.

3.1 Mobilization and Demobilization

Mobilization and demobilization will be timed based on consideration of stream flows and fish passage. The culvert will be installed over a two week period in early summer, preferably during open-mouth conditions before flows at the USGS Santa Cruz gage on the San Lorenzo River have dropped below 20 cfs. After installation, to prevent interfering with seasonal salmonid migration, the culvert will not be operated until natural mouth closure has occurred. City data collected in the lagoon after 2002 show that once flows on the San Lorenzo River at the Santa Cruz gage drop below 20 cfs, mouth closure typically occurs within two weeks. In most years this led to a prolonged closure event by July. Demobilization will occur before the first major rainfall of the season, to prevent scouring and loss of equipment. This typically occurs in late fall or early winter (November-December).

3.2 Operation during Mouth Closure

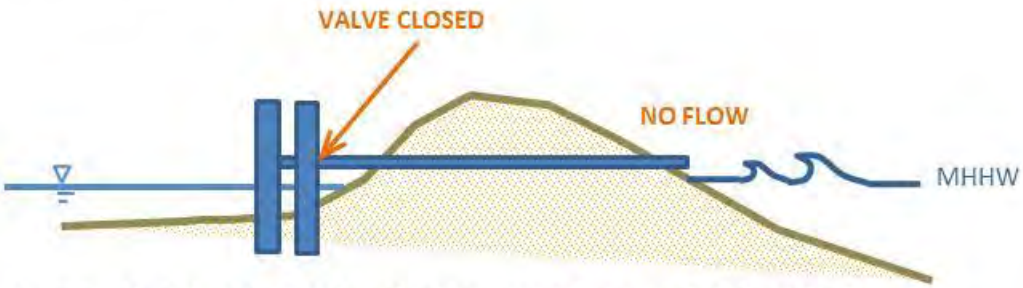
Once installed, the culvert will be operated to maintain a perched lagoon with a water surface elevation at about 5.0 ft NGVD, and to allow the lagoon to reach this level at the same rate that it has in the past. This is illustrated by the diagram below. For the majority of closure events, the lagoon stage rises to the target flood stage of 5.0' NGVD within several days, but during drought years, this may take over one week. To allow the lagoon to reach this elevation naturally (and thus maximize freshwater habitat in the lagoon), the culvert will be operated with a valve, which will be manually operated by City staff to allow flows into the culvert when decided upon by the City. The operation procedure can be summarized as follows:

- During and immediately after installation, the valve will be closed, so that no flows leave the lagoon through the culvert during open mouth conditions.
- Once mouth closure occurs, the valve will remain closed until lagoon stage approaches 5.0 ft NGVD.
- Once the lagoon stage reaches a threshold level below 5.0 ft NGVD, the City will manually open the valve, allowing flows to begin to leave the lagoon from seepage intake into the risers,
- Once the lagoon stage reaches 5.0 ft NGVD, lagoon water will enter the culvert from both seepage intake and weir overflow at the risers.

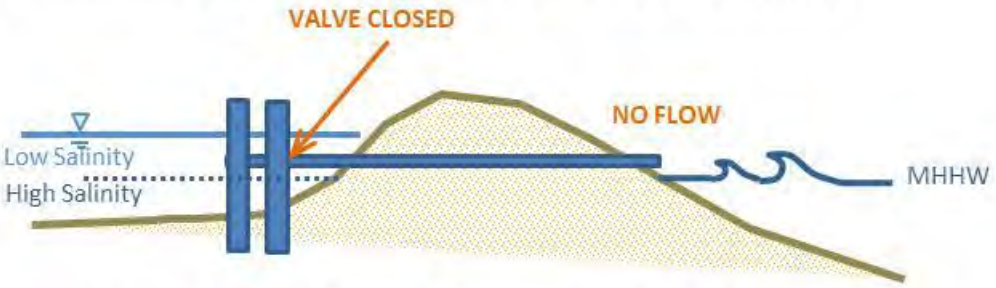
The weir at 5.0 ft NGVD will have an adjustable flashboard, allowing the level at which water overtops into the culvert system to be adjusted to a range of higher elevations. Both the weir and the shutoff valve will be protected from vandalism by welding tops to the risers and enclosing with a lock.

The culvert is not designed or anticipated to influence the natural process of mouth closure. Since the invert of the culvert is above MHHW, it cannot influence flows in the lagoon until the water levels are above this elevation. Since its design includes a manually operated valve, it is not anticipated to influence water levels until they approach 5.0 ft NGVD.

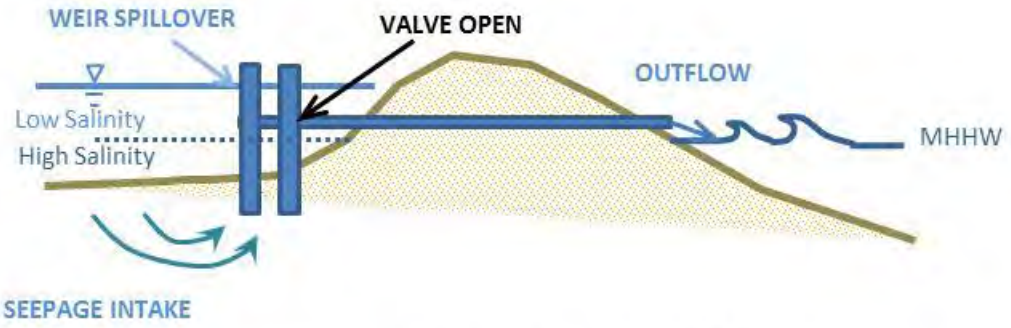
Open Mouth, After Installation



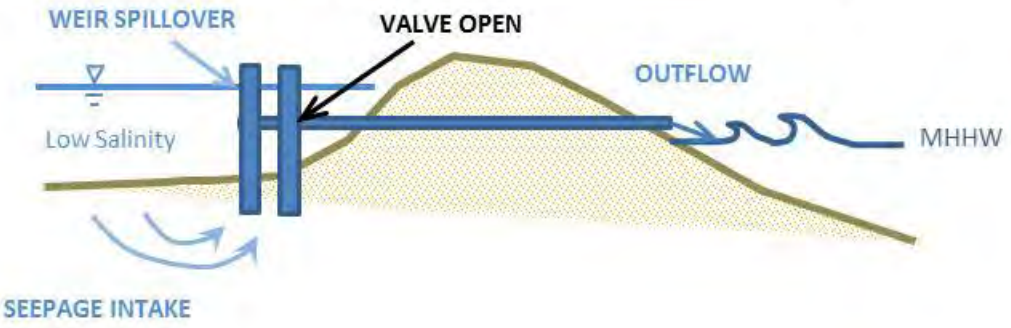
Immediately After Mouth Closure, Stage < 5.0 ft NGVD



After Mouth Closure, Stage Approaching 5.0 ft NGVD



After Mouth Closure, Stage Maintained at 5.0 ft NGVD



4. References

ESA PWA. 2014. San Lorenzo River Lagoon Interim Management Program: Coastal Processes and Data Integration to Support Interim Management Alternatives. Prepared for the City of Santa Cruz.

ESA PWA. 2015. San Lorenzo River Lagoon Interim Management Program: Geomorphic and Engineering Channel Feasibility Study. Prepared for the City of Santa Cruz.