STATE OF CALIFORNIA - THE RESOURCES AGENCY PETE WILSON, *Governor*

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Filed: 05/16/97
49th day: 07/04/97
49 day waiver 06/05/97
Staff: SG/RH
Staff Report: 02/25/98
Hearing Date:03/11/98

STAFF REPORT
REGULAR CALENDAR

APPLICATION:	**3-97-047, Pajaro River Lagoon Sand Bar Breaching**
APPLICANT:	**SANTA CRUZ COUNTY PUBLIC WORKS DEPARTMENT**
LOCATION:	Mouth of Pajaro River, extreme southwest Santa Cruz County (see Exhibit 1).
DESCRIPTION:	Breaching of the sand bar at the mouth of the Pajaro River as necessary for flood control purposes.
LOCAL APPROVALS:	None required by County.
FILE DOCUMENTS:	*Pajaro River Lagoon Management Plan*; Memorandum of Understanding Between the California Department of Fish and Game and the Santa Cruz County Department of Public Works; *Pajaro River Corridor Management Plan*; U.S. Fish and Wildlife Service, "Biological Opinion," April 9, 1997; U.S. ACE Application for Pajaro River Sandbar Breaching; Pajaro River Watershed Water Quality Management Plan, Scope of Services.

SUMMARY OF STAFF RECOMMENDATION

This project is the periodic breaching of the sand bar at the mouth of the Pajaro River as necessary for flood control purposes. Staff recommends that the Commission, after public hearing, **approve** the proposal as conditioned in this report to require that breaching occur only at specified times, location, and by specific method agreed to by the Department of Fish and Game. The conditions also require monitoring of the breach and the lagoon environment in order to gain a better understanding of any breaching impacts. The timing of the permit is coordinated with other agencies' requirements and future renewals or amendments are dependent on responding to the monitoring findings and further analysis of alternatives. The term of this permit would be synchronized with the Corps of Engineers 5-year permit.

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I. STAFF RECOMMENDATION

Staff recommends that the Commission adopt the following resolution by voting "**yes**" on the following Motion:

"I move approval of permit #3-97-47 with the recommended conditions."

RESOLUTION: Approval with Conditions:

The Commission hereby approves a permit, subject to the conditions below, for the proposed development on the grounds that the development will be in conformity with the provisions of Chapter 3 of the California Coastal Act of 1976, is located seaward of the first through public road, and is in conformance with the public access and public recreation policies of Chapter 3 of the Coastal Act and will not have any significant adverse impacts on the environment within the meaning of the California Environmental Quality Act.

II. STANDARD CONDITIONS (See Exhibit A)

III. SPECIAL CONDITIONS

1. Approved Development

This permit approves the breaching of the sand bar at the mouth of the Pajaro River Lagoon according to the methods and procedures described in the *Pajaro River Lagoon Management Plan* and the Memorandum of Understanding (MOU) between the County of Santa Cruz and the California Department of Fish and Game, as clarified in Finding B2 (pages 14-15) and as specified pursuant to Condition # 2 below.

2. Plans and Criteria for Breaching

PRIOR TO COMMENCEMENT OF THE FIRST BREACHING OF THE SAND BAR UNDER THIS PERMIT OR WITHIN 60 DAYS OF COMMISSION ACTION ON THIS PERMIT, WHICHEVER COMES FIRST, permittee shall submit to the Executive Director for review and approval two copies of plans, to scale, showing the breaching area. The plans shall indicate the staging area and routing for equipment to be used in the breaching and shall show the typical breaching site and typical dimensions of the breach, both for fall/winter and spring/summer scenarios. Permittee shall also submit two copies of a written description of the criteria under which breaching is proposed to take place and the operational aspects. The criteria shall include all actions directly related to breaching such as, but not necessarily limited to, lagoon water level which triggers breaching, timing and method of breaching, monitoring of lagoon outflow, avoidance of snowy plover nesting sites, and timing and method of closing the breach, when applicable. Based on the required monitoring, the permittee may update these plans during the life of the permit, subject to Executive Director review and approval of the changes. Also, any plan changes necessitated by the U.S. Army Corps of Engineers' permit review and the National Marine Fisheries Service and the U.S. Fish and Wildlife Service consultations shall be incorporated and submitted for Executive Director review and approval.

3. Term of Permit/Synchronization of Permits

a. Initial Periods: This permit is valid until at least June 1, 1999, which is the expiration date of the current Memorandum of Understanding with the Department of Fish and Game regarding Pajaro River mouth breaching. If the Memorandum is not extended, then this permit shall also expire at that time. If the Memorandum is extended with material changes, other than incorporating the conditions of this permit into it, then this permit will remain valid only upon its commensurate amendment. If the Memorandum is extended without material

changes and the U.S. Army Corps of Engineers has granted a 5-year approval, then this permit will remain valid through the same years, and will have an expiration which coincides with the expiration of the U.S. Army Corps of Engineers permit (or equivalent approval) for Pajaro River mouth breaching. If the Corps has not yet granted a permit, this permit shall then expire on April 1, 2003. (If the Corps has denied a permit, then this approval becomes moot.)

b. Renewals: At least six months prior to permit expiration, the applicant shall submit an outline of its intended strategy to manage the Pajaro River Lagoon mouth after that time to all the relevant regulatory agencies and shall seek a Corps interagency meeting to receive input on its plans. Prior to the permit expiration date, the applicant may seek an amendment to extend the expiration date another five years, provided all other agency permissions remain current and the permittee has submitted the five-year analysis report as outlined in Condition #4d below.

4. Monitoring and Evaluation

a. By SEPTEMBER 1, 1998, permittee shall submit to the Executive Director for review and approval a proposed monitoring program indicating parameters to be monitored, when, where, how, and by whom. The monitoring program shall have two components: a (1) pre- and post-breaching plan and (2) a summer plan.

Pre- and post-breach monitoring shall measure at a minimum fecal coliform, temperature, salinity, and dissolved oxygen and record sand bar status. This shall be in addition to recording the date and time of, equipment used, the wave activity at, and tidal stage at each breach, and the lagoon depth two times daily after the breach until stabilized, as required by the MOU. The monitoring plan should account for the possibility that a breach may have to occur quickly (e.g., monitoring equipment and personnel should be available on short notice to take a pre-breaching sample), to minimize the times when pre-breach sampling will not be possible.

The summer monitoring plan shall be for at least one year when a sandbar forms prior to June 20th (if this occurs over the life of the permit) to sample for fish and water quality. For fish, minimum sampling shall be planned for three times over summer at a minimum of three sites in the lagoon by gill netting or seining. This component shall be supervised by a professional biologist with expertise in aquatic biology. Any additional details of the fish monitoring program that emanate from the U.S. Fish and Wildlife Service and National Marine Fisheries Service consultation process shall be incorporated in the submitted plan. The permittee may be granted a time extension for completing this component of the monitoring plan if other agency review is not completed by September 1st.

For water quality, testing shall be planned to occur three times over the summer, and immediately after a breach, if one occurs, at four sites in the lagoon and at three sites seaward of the berm (opposite, upcoast, and downcoast of the lagoon). At a minimum, temperature, salinity, dissolved oxygen, 4.4DDE, endosulfan sulfate, fecal coliform, nitrates, and phosphates shall be sampled.

b. Within a week after each breach, the permittee shall provide a written description of the breach to the Commission.

c. BY JUNE 1, 1999, AND BY JUNE 1 OF EACH SUBSEQUENT YEAR, permittee shall submit to the Executive Director for review a report containing the results of any monitoring for the preceding year.

d. BY JUNE 1, 2003 or concurrent with an amendment request to extend this permit's time limits pursuant to Condition #3b above, permittee shall submit to the Executive Director a comprehensive description of the breaching that has occurred, the monitoring results, an analysis of any impacts that breaching has had on the species dependent on the lagoon, and, if continued breaching is planned, a updated alternatives analysis that incorporates information learned from the monitoring program and any changed circumstances. The alternatives analyzed shall include, but not necessarily be limited to, floodproofing the Shell Road pump station, raising Shell and Beach Roads and the sanitary sewer manholes, installation of a bypass, and pumping in the summer. The form of the submittal shall be a revision or supplement to the *Pajaro River Lagoon Management Plan*.

5. **Other Approvals**

PRIOR TO COMMENCEMENT OF THE FIRST BREACHING OF THE SAND BAR TO OCCUR PURSUANT TO THIS PERMIT, permittee shall submit a letter of approval or other documentation from the Department of Parks and Recreation and the US Army Corps of Engineers showing that the project has been approved by those agencies, or that no approval is necessary.

6. **Lagoon and River Management Planning**

Permittee shall participate in any future planning activities involving the Lower Pajaro River or Lagoon to ensure coordination between the breaching activities and other initiatives that may result from the planning process.

7. **Public Access**

Operational plans shall minimize any disruption of public access to and on the beach. Staging areas shall be located in a manner to least interfere with public

access and any equipment on the beach shall be promptly removed upon completion of the breaching operation.

IV. FINDINGS AND DECLARATIONS

A. Project Description, Purpose, and Current Method of Operation

1. Description and Purpose

The Pajaro River, which marks the boundary between Santa Cruz and Monterey Counties, forms a lagoon at its mouth when ocean waves build up a sand bar on the beach, blocking egress of the River (see Exhibit 1). Agricultural land lies on both sides of the river. Additionally, on the Santa Cruz County side of the river there is a residential area known as Pajaro Dunes. The agricultural fields and the residential area, as well as the road leading there, are subject to flooding when the water level in the lagoon rises behind the sand bar across the mouth of the river. This typically happens during the rainy season when the water often rises quickly, and during the summer months and early fall when the water rises slowly from agricultural runoff and other relatively small water sources.

Six different areas are impacted when water levels reach various heights above Mean Sea Level (MSL) (see Exhibit 2):

1. The farmland on the Monterey County side of the lagoon begins to be affected at water elevations of 3.0 to 3.5 MSL. At that level, the fields are not yet flooded but the soil becomes too saturated to support crops. Between 4.5 and 5.5 feet MSL the fields flood. Gravity drainage ditches function only at lower water levels. The Santa Cruz County side of the lagoon is somewhat more fortunate because there is a perimeter ditch system with pumps which controls summer flooding.

2. Marsh areas exist along the lagoon and the Watsonville Slough, a tributary to the lagoon which joins it from the north. At water levels of 3.5 to 4.0 MSL, these marsh areas flood. In spring and summer this can adversely affect nesting and foraging areas for waterfowl. Also, salt marsh vegetation is destroyed if it is inundated for too long a period.

3. The lower, mostly open space areas of the Pajaro Dunes residential development begins to flood at 3.5 to 4.0 MSL.

4. The Shell Road pumps, which function to lower water levels in Watsonville Slough, become ineffective when water rises above 5.0 MSL This leads to drainage problems on agricultural lands and makes the pumps work harder.

5. At elevation 5.5 MSL, Beach Road and Shell Road begin to flood. This can cut off vehicle passage to and from Pajaro Dunes.

6. A sewer pump station at Pajaro Dunes begins flooding at water level 6.0 MSL. This can result in raw sewage spills into Watsonville Slough.

2. Current Method of Operation

The proposed project consists of monitoring the level of water in the lagoon and breaching the sand bar at the river mouth, allowing lagoon water to flow into Monterey Bay, thereby reducing the flooding potential of the lagoon. No project plans were submitted with the application. A 1993 Memorandum of Understanding between the County and the Department of Fish and Game, amended in 1994, (MOU #339-93) governs the operation and serves as the narrative project description. When the gauge located in Watsonville Slough (on the southeast corner where Beach Road crosses the Slough) indicates water level is at 3.5 MSL during the rainy season and is rising, the County may begin mobilizing for mechanical breaching. The Department of Fish and Game must be notified. Breaching then begins when the staff gauge reads 4.5 MSL and river flows are predicted that would cause flooding or when water begins to flood Beach Road or Shell Road. In the dry season, mobilization begins when water level reaches 4.5 MSL; breaching may occur at 5.5 MSL. The thresholds are higher during the dry season because the rise in water level is much slower than in the rainy season where heavy rainfall upstream can cause a rapid and large rise in the water level. The breaching is accomplished by grading or digging an opening in the sand bar with heavy equipment. When the water level has dropped sufficiently, the breach may be closed with machinery or it may close on its own depending on tides and weather conditions. After breaching the lagoon, water level is monitored twice a day until stabilized and sand bar reformation has occurred. No attempt is made to close the breach in the rainy season. In the dry season, it is preferable to close the breach to facilitate conversion of the lagoon to fresh water habitat (see below). The County will attempt to close the breach when the water level has receded to 3.5 MSL and will attempt to maintain water level at a minimum level of 2.5 MSL.

3. Regulatory History

Some form of lagoon breaching has been on-going for many years. Breaching generally as described in this report has been occurring for at most nine years. Commission regulatory authority was first exercised over the Pajaro Lagoon sand bar breaching in mid-1988 during a period of unusually high lagoon water (emergency permit #3-88-57G). Since that time dry season breaching has taken place pursuant to an Interim Criteria Plan which includes the Memorandum of Understanding between the County and the Department of Fish and Game.

According to the County, the breaching has never been subject to local permits, is an on-going activity which was established prior to adoption of County codes regulating such activity, and is statutorily exempt from CEQA as an on-going project (Memo from County Environmental Coordinator, March 16, 1994). Nevertheless, the proposal is not exempt from review under the Coastal Act. The area of the breaching operation remains under the retained coastal permit jurisdiction of the Coastal Commission; the standard of review is the Coastal Act.

While each breach could be considered a separate development, issuing a permit to cover more than one breach is a streamlining measure of benefit to the Commission and the County. The Commission finds that it is prudent to have a permitted operational plan agreed to by all relevant agencies in place, rather than to issue emergency and then subsequent follow-up permits for each breach. It is also noted that since the need to address potential lagoon flooding is well-documented, breaching does not really qualify as an emergency activity under the Coastal Act. On the other hand, as further detailed in these findings, the impacts of breaching on the lagoon and river system and habitat are still somewhat unknown, partly due to a lack of monitoring data. There may also be feasible flood management alternatives that do not involve physical alterations to the Pajaro lagoon. Therefore, the Commission cannot permanently endorse breaching to the exclusion of other lagoon management measures. Instead, in the long-term it is desirable to holistically focus on *Lagoon management*. In fact, it was in this vein, that the County Public Works Department and the California Coastal Conservancy contracted with Mitchell Swanson & Associates and the Habitat Restoration Group to prepare the *Pajaro River Lagoon Management Plan*, dated February 25, 1993.

The *Plan* recommends measures to reduce flooding, manage appropriate water levels, and improve water quality in the lagoon for the broader purpose of habitat management. However, as discussed below, the existing management plan needs to be updated and its discussion of lagoon management alternatives, other than breaching, is inadequate. Therefore, given the long-run objective of holistic lagoon management, yet recognizing the need to have a near term strategy for flood management, the Commission finds that it is reasonable to limit the length of time of this breaching permit to initially five years, (which is also the length of a Corps permit). During this time, monitoring, data analysis, and further examination of alternatives can occur. The monitoring information collected as part of the authorized breaching can be used to update the *Plan's* recommendations and conclusions. This update should form the basis of the County's strategy to address any adverse impacts of river mouth breaching or damming after the initial period of this permit approval.

Finally, the noted Corps permit is pending and will require consultation with National Marine Fisheries and U.S. Fish and Wildlife Service. In addition to the Memorandum of Understanding with the Department of Fish and Game which serves as Section 1601 approval, the project has a waiver of water quality certification from the Regional Water Quality Control Board and a State Lands lease. Part of the work may occur on the

Monterey County side of the River; the file includes an approval from Monterey County Water Resources Agency. An encroachment permit from the Department of Parks and Recreation will also be necessary.

B. Consistency of Breaching With Coastal Act

1. Flood Protection

Background: The Pajaro River drains a watershed that has been severely manipulated by urban development, conversion of wetlands to agricultural use, and containment of the river within levees. It is recognized that the River cannot be presently returned to a completely pristine, natural state. The River though, still maintains many of its natural attributes such as riparian vegetation and anadromous fish runs. In many respects it still functions as a natural system. For example, a lagoon still forms at the mouth of the River behind a sand bar with subsequent flooding of adjacent land. As discussed, the County has manipulated the water level in the lagoon for flood control purposes by means of breaching the sand bar. The intent of this report and permit is to more closely examine the manipulation of water levels in the lagoon to develop a method by which both flood control and lagoon and River system ecological objectives may be better achieved.

Governing Policy: The primary Coastal Act policy for addressing flood management concerns is Section 30236, which states:

> *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 floodplain 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.*

Breaching of the sand bar at the mouth of the Pajaro River is a substantial alteration of the River and its lagoon. It meets the three relevant tests of Section 30236. First, the best mitigation measures feasible are contained in the Memorandum of Understanding with the Department of Fish and Game, developed in consultation with professional biologists. Of course, new information from future monitoring may dictate changes in the method of lagoon water level manipulation or in the mitigation measures themselves, particularly concerning the timing of breaching activities.

Second, the public safety necessity is to prevent hazardous driving conditions on the roads. The existing structures needing protection are the roads, sewage system, pumps, and any facilities, such as tile drains, on the farmlands.

Alternatives: Finally, the third test of Section 30236 is that "no other method for protecting existing structures in the floodplain is feasible." As mentioned earlier in this report, rising water levels result in a variety of impacts in the vicinity of the Pajaro River mouth, including impacts to farmland, marsh areas, Pajaro Dunes fields, Beach Road and Shell Road, Shell Road pumps, and sanitary sewer manholes (see Exhibit 2 and Table 1)

In the case of the Pajaro River, alternatives to breaching would include floodproofing all threatened structures, providing back-up storage, using a pump or bypass, or further improving drainage; none of which are feasible in the immediate future, but some of which may be in the longer-term.

Floodproofing: The "problem" structures, (the Shell Road pump, Shell and Beach Roads, and the sanitary sewer manholes) might be able to be protected from flooding by discrete means such as elevating or isolating them from the lagoon with levees. The Commission has no information on the cost of accomplishing this, or what other constraints may exist (e.g., lack of road right-of-way, relationship of infrastructure to roadways). The Shell road pump station is located in lower Watsonville Slough, and floodproofing may trigger various resource agency permit requirements. To determine if it would be feasible to floodproof all threatened structures in the long-term, the Commission would need information on physical requirements, regulatory requirements, legal and other constraints, and costs for floodproofing each structure.

The Commission notes that area flooding is of greater concern in the context of winter storms after the sandbar is breached and that continuing studies and projects are underway to provide more flood protection to the lower Pajaro River valley, such as Santa Cruz County's *Pajaro River Corridor Management Plan* and AMBAG's Pajaro River Watershed Water Quality Planning Project. The Commission supports development of a comprehensive flood control strategy which addresses all hydrologic issues in a manner that is least environmentally damaging and consistent with the Coastal Act. It is thus important for the County Public Works Department to participate in such future planning activities involving the Lower Pajaro River or Lagoon to ensure coordination between the breaching activities and other initiatives that may result from the planning process, as conditioned.

Flood Overflow: Another flood control concept is to recognize and use the historic capacity of floodplains to handle storm water. As noted, significant open lands are flooded when lagoon water backs up before the berm is breached. Buying flood easements on these lands would lessen the need to breach. This is the approach being taken further south at the Carmel River, where a combination of State land purchase and private landowner donation has resulted in a greatly expanded agricultural floodplain. Such an approach might also include a habitat restoration component; i.e., the overflow areas should be chosen and managed in a manner that enhances wetland habitat as well as provides flood protection. To undertake such a program would likely require the participation of other departments and agencies

besides the Santa Cruz County Public Works Department and may or may not alleviate the need for all breaching.

Drainage: Another possible alternative is to find a different way to drain water that backs up behind the lagoon berm. The *Lagoon Management Plan* examined such an approach, but only as a partial alternative to breaching. The *Plan* describes this alternative as including

> *improving and/or adding pumps, perimeter ditches, and culverts and continuing the interim breaching program. When implemented, this alternative should buffer adjacent lands from flooding when the Summer lagoon reaches 5.0+ feet. A monitoring program would be implemented to ensure the success of this alternative.* (Page 31)

The *Lagoon Management Plan* goes on to state that these improvements would be less effective

> *when the sand bar is present during periods of rainfall. Under these circumstances, often in the fall, it may be necessary to breach the sand bar when the lagoon level reaches critical stage (above 4.5 feet) or earlier . . . .* (page 31)

The improvements listed under this alternative involved the Shell Road pumps, Beach Road drainage ditch outlet, and gravity outfalls on the Monterey County side of the River. These pumps drain Watsonville Slough, a tributary to the lagoon. Part of the Shell Road pump outlet pipe was subject to leakage, causing the pumps to operate inefficiently and thereby reducing drainage capability. It was recommended that the pump outlet pipe be repaired until the pump system could be replaced with an upgraded facility. The Beach Road drainage ditch runs along Beach Road, which is the only road into and out of the Pajaro Dunes area. The outlet is a 36 inch culvert with a flapgate which has experienced leakage, allowing water from Watsonville Slough to backflow into the Beach Road Ditch exacerbating flooding of the road. It was recommended that the flapgate be replaced. Two gravity flow culverts on farm land on the Monterey County side of the lagoon provide some drainage from the fields to the lagoon. The *Lagoon Management Plan* recommended the installation of pumps landward of the two culverts to pump water over the levee.

Although all of the recommended improvements have now been implemented, it is as yet unknown how well the improvements have worked. Whether even additional improvements could be made to further reduce the need to still breach under this alternative is also unknown.

Pumping: Another alternative is to pump out water rather than breaching the sandbar. The *Pajaro River Management Plan* examined pumping, with three variations. The pumping alternative was based on the use of pumps to regulate the water level in the lagoon. The pump or pumps could discharge onto the beach or near the Pajaro Dunes

rip rap. According to the *Plan*, the pumps would very likely disturb the bottom sediments where pesticide contaminated sediment lies and thus which could not be discharged onto the beach or directly into the ocean. The *Plan* considered connecting the pump(s) to an old outfall line, but that alternative was rejected because of the cost of repairs to the old line and, again, there would be an undiluted and untreated discharge into the ocean. The third alternative using pumping considered discharge into the existing City of Watsonville sewage outfall line. That alternative was rejected because "contamination of lagoon waters by pesticides could be worsened by the increased circulation of waters and muddy substrates brought about by pumping. A separate pump and drainage system would be required," including access across private properties, a pipeline from the contaminated source areas and a separate pump, estimated to cost $300,000 to $500,000. Thus, none of the pumping alternatives were found to be feasible.

The Commission concurs there are too many constraints to render any of these pumping alternatives immediately feasible. There are, however, possible ways to overcome these constraints that deserve evaluation. Further evaluation of the water quality is necessary to determine both the extent of the contamination problem and whether there are pumping methods to minimize stirring up the bottom sediments. Pumps could be placed within the water so that they do not stir up bottom sediments. The County could work with the City of Watsonville to secure Regional Water Quality Control Board approval to use the wastewater discharge line, as Santa Cruz City has done at Neary Lagoon. More information is needed to determine if an expensive, separate pump system is required, as contended. Thus, for the longer-term, further review of the pumping alternative is warranted.

Bypass: Yet another alternative is installation of a drain culvert structure near the mouth of the lagoon such as exists in Capitola on Soquel Creek or the drain approved by the Commission, but not yet implemented by the City of Santa Cruz, for the San Lorenzo River Lagoon. This structure would have a gate or other device for regulating amount of water passing through it and would include a pipeline through the beach berm. Whether such a device which was designed for San Lorenzo River at the base of a rock point would be feasible at Pajaro River Lagoon with its wider, less constrained mouth is unknown.

Conclusion: At this time there are no feasible alternatives to breaching and thus the project can be considered consistent with Coastal Act Section 30236. There are six identified areas that are impacted by rising waters trapped behind the Lagoon beach berm. There are different approaches to alleviating these impacts, many of which have identified constraints. Further research and actions regarding funding, agency approvals, and other matters are needed to establish feasibility. It is likely that different approaches may be most feasible and appropriate for different impacted areas. From these, it may be possible to derive one or more alternative scenarios to breaching involving a combination of measures. Given the policy directive and the adverse impacts that can result from breaching (see next finding), the Commission would expect

that the County use the five year period of this permit to institute alternative measures to reduce, if not eliminate, the need to breach. In order to do so, further alternatives analysis is necessary. If the County chooses to continue breaching over the longer-term, submittal of information on the infeasibility of breaching will be crucial. As conditioned to review breaching alternatives and to limit initial effectiveness to five years, this permit is consistent with Coastal Act Section 30236.

2. Marine and Riverine Lagoon Environment

Background: The fish population of the Pajaro River Lagoon includes marine and freshwater species. Pacific herring, shiner perch, staghorn sculpins, striped bass, juvenile steelhead, and tidewater gobies, have been found in the lagoon. Both the steelhead and the tidewater goby are listed by the federal government as endangered species. The lagoon and surrounding vegetation support several species of birds including the federally listed brown pelican, ducks and migratory waterbirds. The federally listed snowy plover nests on the sandy beach. Vegetation in and around the lagoon includes pickleweed, salt grass, alkali heath, willow, and other species of salt marsh, brackish marsh, riparian, and coastal scrub communities.

Governing Policy: The following Coastal Act sections are relevant to the protect of the marine and riverine environment:

> *Section 30230: Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*
>
> *Section 30231: The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*
>
> *Section 30240(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.*

Breaching may be beneficial to the habitat. As mentioned above, marsh areas along the lagoon flood at water levels of 3.5 to 5.0 MSL, disrupting nesting and foraging. Flooding of the marsh areas can, according to the *Lagoon Management Plan*,

> *significantly preclude wildlife use of portions of the lagoon and slough habitats, particularly use of the marshes by nesting ducks and shorebirds.*

This is clearly a concern under Coastal Act Sections 30231 and 30240. Of course, historical maps of the area show a much larger area of salt marsh than is there now. Most of the historical marsh has been converted to farmland or residential uses. Thus, retaining the remaining marsh area in a functional manner is important.

Potential Impacts and Necessary Mitigations: However, breaching can also have deleterious effects on marine and riverine resources. The quantity and quality of habitat can be radically altered by breaching. For example, species living in the lagoon can be swept out to the ocean, changes in salinity could be detrimental to the fish, and possible pesticides in the lagoon water could be released to the ocean when the sand bar is breached.

Species and Salinity: Sand bar formation and subsequent breaching can have varying effects on the habitat, depending on season. When the lagoon is open to the ocean the salinity of the water ranges from ocean levels, around 34 parts per thousand, to fresh or almost fresh water levels in the extreme upstream end of the lagoon. The salinity varies not only horizontally, but also vertically. Calm conditions result in stratification -- the "layering" of water where the hotter, denser, heavier saline water occupies the lower portions of the water column with cooler, lighter, less saline water rising to the top of the water column. Strong winds or the influx of additional water can cause the layers to mix, resulting in a more uniform water column with respect to salinity. With a greater or lesser amount of freshwater inflow from upstream and a lack of additional saltwater because of the sand bar, a closed lagoon will gradually convert from saline water to fresh water. The data in the *Management Plan* indicate that, at least in drier years, conversion of the lagoon water from saline to relatively non-saline could occur in about 2.5 months. The later the sand bar forms and/or the more salt water that enters the lagoon, the longer it takes to convert to fresh water and the greater potential for harming organisms dependent of the conversion. Conversely, without tidal mixing (which implies a breached sand bar, mechanically or by current and/or wave action), water quality may not be adequate for species such as steelhead.

If a sandbar forms in the **spring**, high lagoon water levels would not generally occur, but could with a late rain or release of water from College Lake. The County will maintain the sandbar when it is possible to do so safely. Mature steelhead migrate

from the river to the ocean from April to early June and should be out of the lagoon before a sandbar forms. If one does form and a breach is necessary, the Memorandum of Understanding includes provisions prohibiting the County from mechanically reclosing the berm before June 15th. This is because closure of the berm may trap outmigrating steelhead smolts. According to biologist Jerry Smith, steelhead should be out of the lagoon by June 1st. This is one aspect of the MOU that could benefit from additional monitoring and could be modified, if necessary to reflect this earlier date..,

Breaching in **late spring or summer** months delays seasonal conversion to freshwater. The sand bar usually forms in early to mid-summer, but has closed as late as August. The Pajaro River lagoon then changes from a brackish water system to a fresh water system during these summer seasons when there are no abnormal weather patterns or events. According to the *Lagoon Management Plan*,

> *A well circulated lagoon in the summer months is important for biological productivity, especially benthic (bottom dwelling) organisms. These become food for larger animals and eventually birds. Steelhead trout may use the lagoon for juvenile rearing since the lagoon can provide good conditions for growth before entering the Ocean. Sand bar breaching delays or prohibits the summer conversion to fresh water and causes a degradation of habitat quality, possibly creating lethal conditions . . . . It should be noted that in general high lagoon levels (say above 4.0 feet MSL) are not necessarily needed to have good habitat per se, what is important is to find alternative methods of flood prevention and lagoon water level control without sand bar breaching.*

Breaching may also wash spawning fish out to sea before they are ready, which is not until late fall. Formation of the sandbar in the summer also "optimizes habitat conditions for the tidewater goby by minimizing tidal and stream currents up to and beyond the bridge at Highway 1" where they spawn and rear. (U.S. Fish and Wildlife Service, "Biological Opinion," April 9, 1997). Therefore, the Memorandum of Understanding requires the County to attempt to re-close the river mouth after a "late spring artificial breach" once the water level recedes to +3.5 MSL; i.e., before the lagoon completely empties. The MOU could be clarified to state that this refers to the period after early June, when the steelhead migration is complete. since this criteria is appropriate into the summer as well.

Breaching in the **fall** creates salinity conditions that are too high. After a breach, the sand bar would reform quickly and create highly saline, stratified conditions in the lagoon. The *Lagoon Management Plan* states, "Under stratified conditions, fish and other aquatic organisms, especially benthic organisms, cannot survive. Without the basis for a healthy food chain, the biological productivity of the lagoon is diminished for fish, birds and other wildlife." (Page 3) The usual scenario, is for the sand bar to be breached by high flows in the River combined with a beach reduced in height by storm waves in late fall or early winter. Lagoon levels can raise quickly to higher levels in the rainy season. At such times mechanical breaching may be hazardous if not impossible

if there are also large storm waves which can preclude operation of heavy equipment on the sand. However, in drought years the sand bar may remain closed throughout the year. This may necessitate a fall or winter breach if the lagoon water level gets too high. The Memorandum of Understanding requires the County to delay a fall breach as long as possible.

Winter flows associated with upstream rainfall often lead to non-mechanical breaching of the sand bar, again depending on the specific weather pattern for that year. Thus, open lagoons are a natural occurrence in winter and artificial breaching typically does not need to occur.

One additional species of concern is the snowy plover. Plovers nest on the beach, and could be affected by equipment traveling along the beach to do the breaching. Operational plans should ensure that the nests are not impacts, as conditioned. Consultations with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service that will occur as part of the U.S. Army Corps of Engineers permit review may provide more specifics as to any required mitigation, which should then be incorporated into the operational plans.

Pesticides: The waters of the Pajaro River and it tributaries run through agricultural, residential, and industrial areas before reaching the lagoon. The lagoon itself is bordered mostly by agricultural fields. According to the *Pajaro River Lagoon Management Plan,* pesticides have been found in the lagoon waters, including, "endosufhan sulfate, a by-product of endosulphan, a pesticide often used in artichoke cultivation . . . and 4,4 DDE a toxic by-product of DDT." Both of these are toxic to organisms found in and around the lagoon. Both contaminants are found in the soils and are apparently washed into the lagoon by rain water or possibly irrigation water. Untreated urban stormwater flows into the lagoon and may contain grease, oil, heavy metals, and other pollutants. Breaching may release these contaminants to the ocean. However, since natural breaching may do the same and since breaching is not the cause of the contamination, it can be allowed to proceed in the interim. For future evaluation of breaching it will be helpful to better understand its relationship to contaminants, particularly concerning the question of whether other alternatives exist that might still achieve flood management goals yet minimize environmental impacts. Also, as noted, concern with the contamination which could result from pumping led to a rejection of that alternative, based more on speculation than actual data. Therefore, over the life of this permit, some additional water quality testing should occur. More systematic testing for these two known contaminants may yield some useful information, recognizing that it will not present a complete picture of the extent of water quality problems. It will complement future lagoon sediment testing funded by AMBAG as part of the Pajaro River Watershed Water Quality Management Plan. Although the County does not routinely test for these contaminants, they have the equipment and ability to do so in house; therefore, there should not be a very large expense involved. (Peters to Hyman 2/2/98).

Future Monitoring and Mitigation: The *Pajaro River Lagoon Management Plan* (pp. 18-19) summarizes these water quality and habitat issues, primarily based on two years of observation, 1991 and 1992. However, two years of data is insufficient for adequate understanding of lagoon habitat dynamics, particularly since these years may have been atypical in terms of sandbar formation. Moreover, since the *Management Plan* was prepared, the steelhead and tidewater goby have been listed as endangered. Given the likelihood that the County may wish to continue breaching in the long-term, more information on the fish population and needs is necessary. If there is a year where the sandbar forms prior to summer (i.e., June 20th), then baseline information on the fish population should be gathered. This would enable a better understanding of what impacts could result from spring breaching. A minimum of three sites should be sampled in the lagoon three times each during the summer, using a gill netting or seining from a boat. Consultations with National Marine Fisheries Service and U.S. Fish and Wildlife Service that will occur as part of Army Corps permit may provide more specifics as to the required monitoring protocols. Furthermore, if any endangered species are "taken" as a result of breaching, mitigation will likely be required.

Additionally, although the Memorandum of Understanding is designed to minimize adverse impacts, it is not absolute. For example, it states that "attempts" must be made to close summer breaches, but they could fail. Therefore, it is important to known the condition of the lagoon after each breach (as well as before, to have measurements to compare). In addition to measuring salinity and pesticides as discussed above, other complementary parameters to know to determine the health of the lagoon and its suitability as habitat include temperature, dissolved oxygen, and fecal coliform. The County already monitors for fecal coliform, and has the equipment available to monitor and derive the results of these other factors in-house.

As noted in the previous finding, the Coastal Act requires alternatives to breaching, if they are feasible, and it may be possible to develop a comprehensive alternative. If not, some measures could still be instituted to reduce the need for breaching or possibly to fine-tune the breaching protocol to better protect the species that inhabit the lagoon. Given the greater concerns with summer breaching and the fact that late fall/winter breaching occurs naturally, focusing on summer breaching is most worthy. Despite the negative evaluation to date, the alternative measure that seems most promising is pumping. This would better control the amount of water that needed to be drained and alleviate the need to try to manually reclose a breach.

Given that the County may wish to continue at least some breaching into the longer-term, i.e., beyond five years, more data would be necessary to be able to continue making a finding of consistency with the cited Coastal Act sections. Over the last several years that the breaching has taken place, no impacts which would significantly degrade the area have been apparent, but neither has there been any on-going monitoring of the lagoon habitat. This data will also prove useful in the evaluation of alternatives to breaching that may be developed. Furthermore, implementation of the Memorandum of Understanding and the possible need to respond to new situations

(e.g., that the recent listing of the tidewater goby and steelhead to the endangered species list that may require more protective measures) make monitoring imperative. The results of such monitoring can supplement the previous monitoring reported in the *Lagoon Management Plan* and the conclusions updated if necessary. Any impacts on the marine and river lagoon environment will have to be mitigated. In conclusion, because of no notable adverse impacts to date from breaching, the habitat protection measures built into the Memorandum of Understanding, the interim nature of the breaching allowed by this permit, and the additional monitoring and analysis required, the Commission finds that the proposal, as conditioned, is consistent with Coastal Act Sections 30230, 30231 and 30240.

3. Public Access

The following Coastal Act Sections must be adhered to with respect to public access:

> *Section 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.*
>
> *Section 30212: (a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources,*

The beach seaward of the Pajaro River Lagoon is accessible from Sunset State Beach to the north and Zmudowski State Beach to the south; the beach itself is owned and managed by the Department of Parks and Recreation, who will need to permit the County to access it to perform the breach. The wide sandy beach is almost always passable; the times when it may not be are when there are high tides coupled with storms or when the Pajaro River is flowing to the ocean.

The number of times per year that the Public Works Department breaches the lagoon can vary widely depending on winter rainfall, the height of the sand bar, agricultural runoff, etc. In any event, when the sand bar is breached, either with or without human assistance, the beach may be impassable depending on the depth of the channel resulting from breaching and the strength of the current of the flow from the lagoon.

Coastal Act Sections 30211 and 30212 together require that development generally not interfere with the public's right of access to the sea and along the coast. One of the exceptions to this requirement is when such access is inconsistent with public safety. In the case of breaching, whether natural or induced, the volume and velocity of water flowing from the lagoon to the ocean may be such that lateral beach access is impossible. There are two public safety issues here. One is the hazardous nature of attempting to cross the river; the other is the need to protect the public from sewage

spills if the sewer pump station is flooded and from hazardous driving conditions if Beach Road floods. If the sewage pump fails, the lagoon waters will become contaminated and a public hazard will result. Therefore, maintenance of water levels in the lagoon is essential for maintaining safe public access.

On the other hand, the work should be accomplished in a manner that minimizes the time and area that the beach is closed or impassable. The required final operational plans should show that any disruption of public access to and on the beach is minimized. Staging areas shall be located in a manner to least interfere with public access and any equipment on the beach shall be promptly removed upon completion of the breaching operation. As conditioned, and as further conditioned for Department of Parks and Recreation approval, the proposal is consistent with Coastal Act Sections 30211 and 30212.

C. California Environmental Quality Act (CEQA)

Section 13096 of the California Code of Regulations requires that a specific finding be made in conjunction with any coastal development permit applications showing the application to be consistent with any applicable requirements of CEQA. The project is statutorily exempt from CEQA (County Environmental coordinator 3/16/94). Nevertheless, Section 21080.5(d)(2)(i) 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 impact which the activity may have on the environment. The Commission finds that only as approved and conditioned will the project not have any significant adverse impacts on the environment and can be found consistent with CEQA.

W14b

EXHIBIT-A

RECOMMENDED CONDITIONS

STANDARD CONDITIONS:

1. Notice of Receipt and Acknowledgement. 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. Compliance. All development must occur in strict compliance with the proposal as set forth in the application for permit, subject to any special conditions set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.

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

5. Inspections. The Commission staff shall be allowed to inspect the site and the development during construction, subject to 24-hour advance notice.

6. 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.

7. 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.

EXHIBIT NO. A

APPLICATION NO.
3-97-47

Standard Conditions

California Coastal Commission

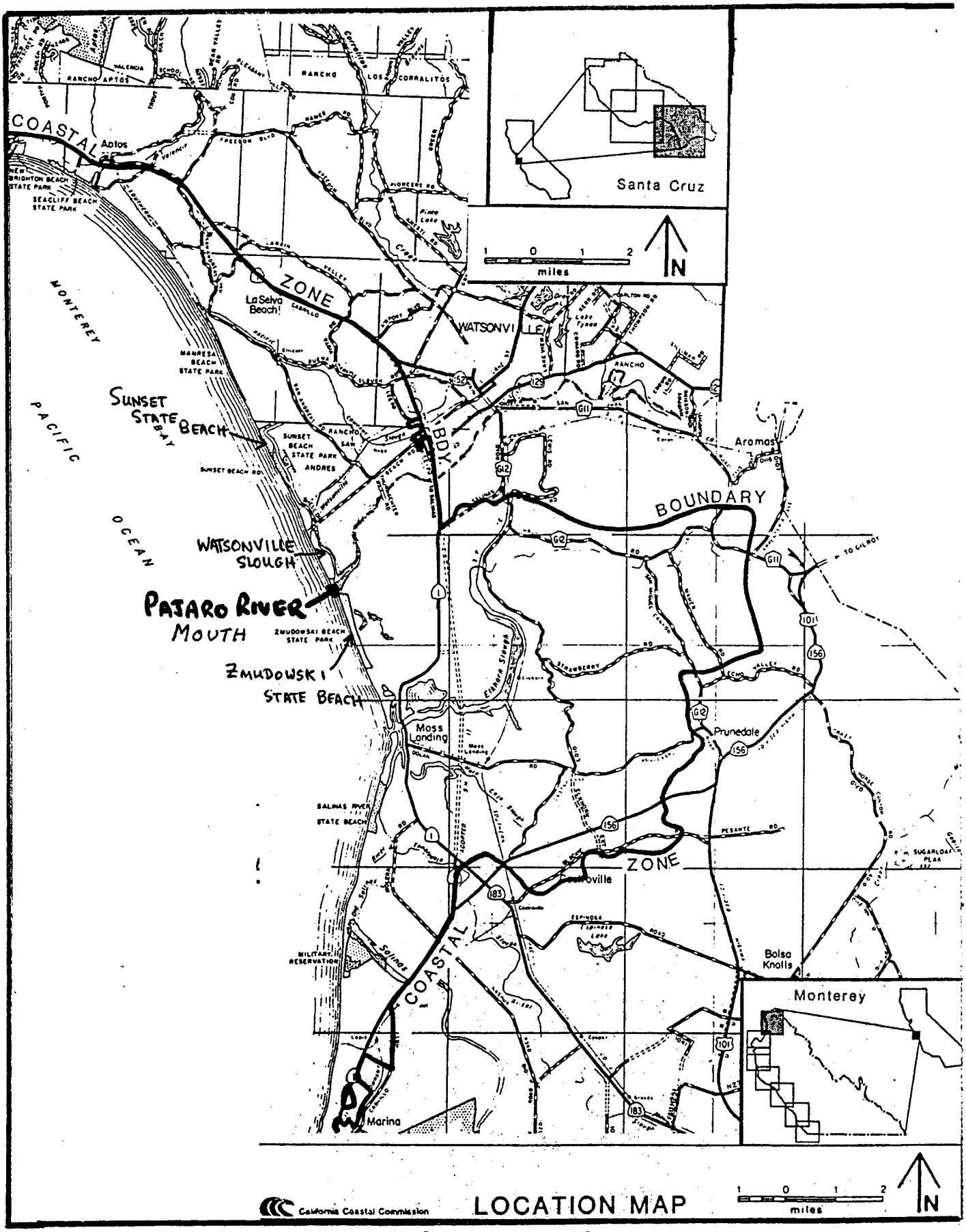

EXHIBIT 1
3-97-047

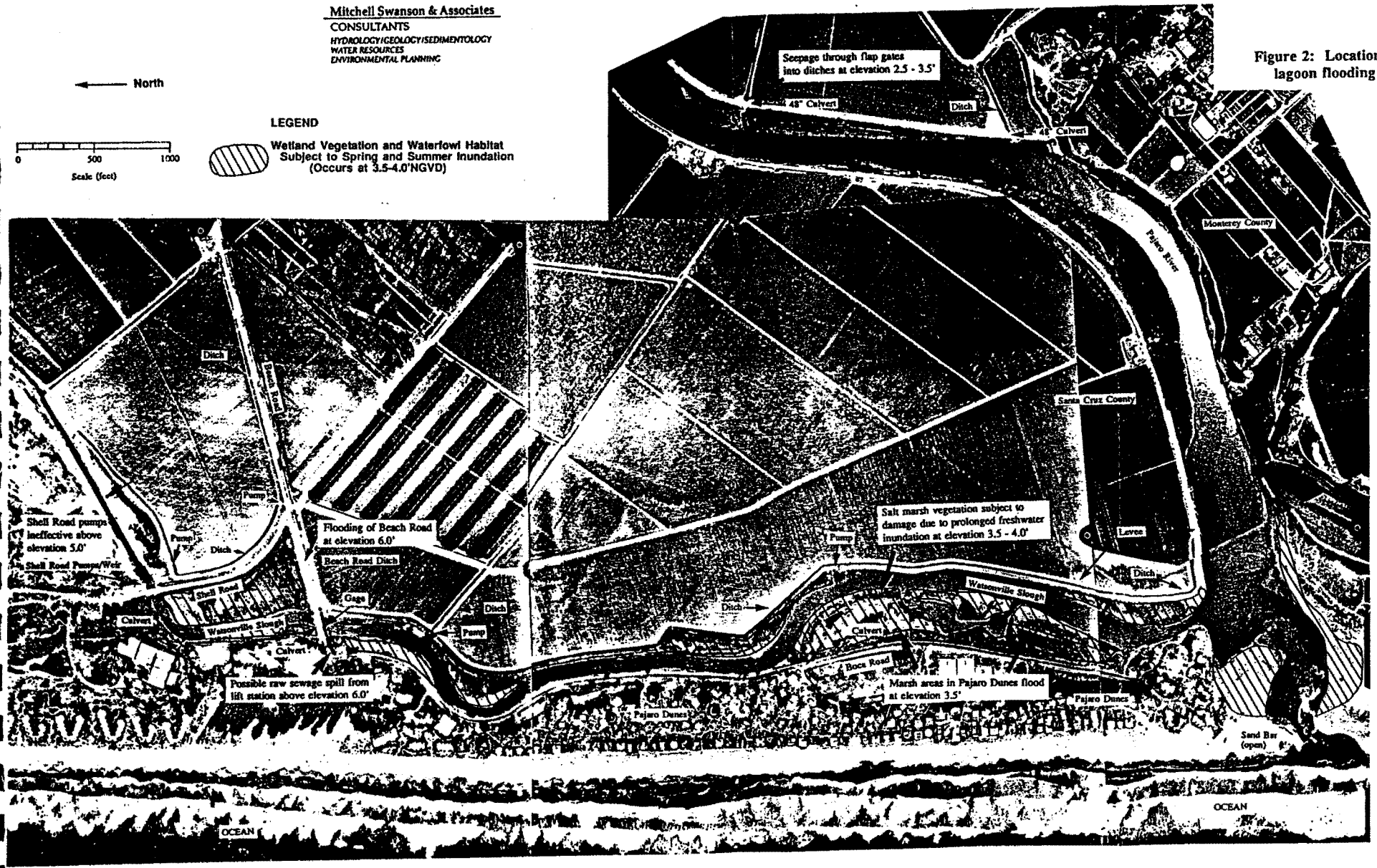

Figure 2: Location of summer lagoon flooding problems.

EXHIBIT 2
3-97-047

PAJARO DUNES SHORE BIRDS
101 SHELL DRIVE, WATSONVILLE, CA 95076
(408) 761-7752

August 27, 1997

California Coastal Commission
Central Coast Area Office
725 Front Street Suite 300
Santa Cruz, CA 95060
Attn: Steve Guiney

Dear Mr. Guiney:

This is in regards to Permit Number 3-97-047 Pajaro Rivermouth, Santa Cruz APN 052-231-18

I represent the homeowners of Pajaro Dunes Association and Pajaro Dunes North Association.

It is imperative that this permit be granted in order to protect the 565 homes, five office buildings, and six conference halls at Pajaro Dunes as well as neighboring farm land.

Santa Cruz County Department of Public Works, State Parks, and Fish and Game have worked together for several years to formulate this plan. It works well and I believe satisfies all concerned agencies.

Prior to the current plan, the County road leading to Pajaro Dunes and much of our property would flood before the river was breached. Access was impossible and several structures were in jeopardy.

Thank you for your attention to this matter.

Sincerely,

Carol L Turley

Carol L. Turley
Manager
Pajaro Dunes North Association

EXHIBIT NO. 3
APPLICATION NO.
3-97-47
Correspondence