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

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STAFF REPORT REGULAR

APPLICATION NO.: 3-96-088

APPLICANT: MONTEREY COUNTY WATER RESOURCES AGENCY (MCWRA)
AGENT: John Gilchrist and Associates

PROJECT DESCRIPTION: Flood Control Berm, approximately 620 ft. in length, 10 feet wide at top, 25 foot wide footprint; maximum elevation 7.5 NGVD; import approximately 1400 cubic yards fill.

PROJECT LOCATION: Along east side of the Old Salinas River Channel, west of Moss Landing Road and south of Sandholdt Bridge, Moss Landing, Monterey County, APN 133-201-16, 17.

LCP JURISDICTION: North Monterey County
ZONING: RC (CZ) Resource Conservation
LUP DESIGNATION: Wetlands and Coastal Strand

CEQA: Negative Declaration 3/5/91; Negative Dec. 7/2/97

LOCAL APPROVALS: Monterey County Grading Permit, PC 7636 5/8/91.

STATE PERMITS: State Lands; Department of Fish and Game 1601
FEDERAL PERMITS: USACOE 19044S27 5/24/91, approved wetland delineation 7/7/95.

FILE DOCUMENTS: Certified North Monterey County Land Use Plan, 1982; Biological Assessment of Proposed Flood Control Dike at Old Salinas River, Moss Landing, ABA Consultants, September 28, 1989; Erosion Control Management Plan, MCWRA, October 1990; Alternative Analysis and Mitigation Plan, Moss Landing Flood Control Berm and Mitigation, MCWRA, January 1993 and July 1994; Moss Landing Berm-Wetland Redelineation, Habitat Restoration Group, April 25, 1995 and a Wetland Delineation, John Gilchrist and Associates, 1997; Revised Moss Landing Berm Wetland Mitigation Plan, John Gilchrist and Associates, October 1997.

SUMMARY OF STAFF RECOMMENDATIONS

The site is located on the Old Salinas River (OSR) south of Moss Landing Harbor and north of the Potrero tidegates. This area receives tidal flows through the harbor and fresh water flows from the Old Salinas River and its tributaries. The applicant proposes to construct a flood control berm between Watertower Hill, site of the future Moss Landing Marine Lab, and the existing flood control berm on Moss Landing Harbor District property. It will parallel and functionally replace a portion of a deteriorating railroad berm located 200 to 300 feet into the former channel. The floodplain area inland of the railroad berm receives limited tidal inundation from the OSR through breaks in the berm. A pickleweed marsh has reestablished in this area and the berm, though in large part located on upland grasslands, will fill 0.158 acres of delineated wetland.

Section 30236 of the Coastal Act provides for flood control projects where necessary for public safety or to protect existing development. High tidal flows in combination with high river flows flooded the town of Moss Landing in 1982-83. The existing railroad berm which previously protected the area has seriously deteriorated allowing increased tidal flows behind the berm. The applicant has demonstrated that the area is subject to flooding which could impact the safety of the public and existing development in the town of Moss Landing.

Section 30236 allows for alterations of rivers for flood control when no other method is feasible. The applicant examined and rejected as infeasible 3 alternatives: (1) no project - would not provide flood control; (2) repair of existing railroad berm - berm is significantly deteriorated and repair and maintenance would required equipment access across the wetland; (3) crossing North Monterey County School District Property - the School District will not allow encroachment on their site, parking areas and trees would be lost.

Section 30236 requires the best mitigation measures feasible when altering rivers. The berm footprint was reduced at the request of the DFG. The Moss Landing Berm Wetland Mitigation Plan achieves (1) like-for-like habitat replacement -- salt marsh is being destroyed and salt marsh is being replaced; (2) no net loss; existing wetlands are not being used to mitigate for loss of another wetland; (3) no net loss; an equal or greater acreage is being created. The ratio of wetlands restored to wetland lost is 3:1. In addition, the created wetland is directly adjacent to existing wetland increasing the probability for success. The berm is designed with two culverts to allow continued fresh water flow into the channel from the uplands. The Mitigation Plan has been approved by the DFG. See Special Conditions 2, 3, and 4.

Section 30253 requires that new development neither create nor contribute significantly to erosion, geologic instability or destruction of the site or surrounding area. The creation of Moss Landing Harbor and planned and unplanned dike breakage significantly accelerated erosion in Elkhorn Slough. The scientific community is concerned that altering the OSR riverbank will cause erosion. The applicant will leave existing dikes in place to deteriorate naturally. The DFG, USACOE, Monterey County and Coastal Commission will monitor the mitigation plan and provide for corrective actions. See Special Condition 4.

Section 30210-14 provides for maximizing public access. Currently there is no public access. The proposed berm appears to be almost exclusively on private property. Public access is planned on the adjacent Moss Landing Marine Lab to the south and on the Moss Landing

Harbor District site to the north. Future access across this site may be appropriate. Finding 7 recommends that the MCWRA work with the adjacent public agencies if an access network is planned.

Jurisdiction: The berm construction is located at the intersection of the Commission's original jurisdiction and the Monterey County permit jurisdiction. The development has been reviewed by Commission staff as a whole. Because of the greater potential for major storms and floods that may be created by the El Nino effect, to provide for expedient processing the Executive Director has filed the permit application prior to finalization of the legal easement to construct on the property of Richard Haake et al. (APN 133-201-16). The permit has been conditioned to require that prior to issuance of the permit, the applicant shall submit evidence of the legal right to construct the berm on the Haake property. See Special Condition 1. Special Condition 6 requires submittal of any Monterey County approvals required prior to commencement of construction.

The staff recommends **approval** of the project as conditioned.

EXHIBITS:
Exhibit 1 - Location Map
Exhibit 2 - North Monterey County Land Use Map (partial)
Exhibit 3 - Moss Landing Community Plan Map
Exhibit 4 - Schematic Site Plan and Surrounding Features
Exhibit 5 - Major Plant Communities on Project Site
Exhibit 6 - Site Plan
Exhibit 7 - Elevations
Exhibit 8 - Wetland Delineation
Exhibit 9 - Gilchrist & Associates, Letter of 10/16/97 re: Flood Risk
Exhibit 10 - Harbor District Mitigation Site/Proposed Flood Control Berm Site

I. STAFF RECOMMENDATION

Staff recommends that the Commission adopt the following Resolution:

Approval with Conditions

The Commission hereby grants a permit 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, will not prejudice the ability of the local government having jurisdiction over the area to implement a Local Coastal Program in conformance with the provisions of Chapter 3 of the Coastal Act, is located between the sea and the first public road nearest the shoreline 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. RECOMMENDED CONDITIONS

A. 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 this permit is reported to the Commission. 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 the 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 conditions will be resolved by the Executive Director or the Commission.

5. Inspections. The Commission staff shall be allowed to inspect the site and the project during its development, 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.

B. Special Conditions

1. Legal Interest to Undertake Development. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, for any portion of the development area not within the public trust, the permittee shall submit to the Executive Director for review and approval, evidence of legal interest to proceed with development activities on the Haake et al. property (APN-133-201-16). Such evidence can be in the form of recorded easements, encroachment permits, or other legal documentation acceptable to the Executive Director.

2. Final Plans. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit to the Executive Director for review and approval, the final plans for the flood control berm. Only clean fill material shall be used for the berm pursuant to California Department of Fish and Game direction. The permittee shall identify the source of the fill and shall provide an analysis of its grain size. Fill material of a grain size or source with the potential for contamination shall be analyzed pursuant to a request by the Department of Fish and Game.

Fill material analysis of grain size and potential contamination, and grading and construction plans shall be reviewed and approved by the Environmental Monitor and the Department of Fish and Game before submittal. Any subsequent modifications must be submitted for review and approval of the Executive Director prior to implementation.

3. 1601 Stream Alteration Agreement. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit to the Executive Director for review and approval a California Department of Fish and Game Final 1601 Stream Alteration Agreement. Conditions of the Agreement shall be reviewed and approved by the Executive Director and shall be implemented by the permittee.

4. Environmental Monitor. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit to the Executive Director for review and approval, the name, address, telephone number, and qualifications of an environmental and condition monitor. The environmental and conditions monitor shall be funded and provided by the permittee. The environmental and condition monitor shall submit a pre-construction report, a post construction report, and annually thereafter a monitoring report pursuant to the Mitigation Plan. The annual monitoring reports shall be submitted to the U.S. Army Corps of Engineers, the State Department of Fish and Game, Monterey County and the California Coastal Commission. At the conclusion of the five year monitoring and maintenance period, a report shall be provided to the Executive Director for review and approval, which either documents the successful establishment of the approved restoration plan or provides for an extended monitoring program, including appropriate corrective actions, which shall be implemented until successful establishment of the approved plan has been achieved to the satisfaction of the Executive Director.

5. State Lands. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit to the Executive Director:

a. Evidence that no State Lands are involved in the development; or

b. State Lands are involved in the development and all permits, including dredging, required by the State Lands Commission have been obtained, or

c. State Lands are involved in the development, but pending a final determination an agreement has been made with the State Lands Commission for the project to proceed without prejudice to that determination.

6. Other Permits/Approvals. PRIOR TO COMMENCEMENT OF CONSTRUCTION, the permittee shall submit to the Executive Director for review:

A. Army Corps of Engineers. A copy of the U. S. Army Corps of Engineers Permit, letter of permission, or evidence that no Corps permit is necessary.

B. U. S. Fish and Wildlife Service. Evidence that the U. S. Fish and Wildlife Service has reviewed and approved the mitigation plan.

C. Monterey County Permits as required.

III. FINDINGS AND DECLARATIONS

The Commission hereby finds and declares:

1. **Location, Project Description, and Coastal Jurisdiction**

Moss Landing Harbor is one of four harbors located along the Central Coast. It is sited near the center of Monterey Bay about 80 miles south of San Francisco. The harbor occupies a portion of the Old Salinas River (OSR) channel, paralleling the coast and separated from the ocean by sand dunes. The OSR is hydrologically connected to the Salinas River by a slidegate 3 miles to the south. The Moss Landing Harbor entrance channel divides the Harbor into a northern and southern arm. Approximately 175 recreational boats and 200 commercial boats are berthed in the Harbor including the Monterey Bay Aquarium Research Institute's ocean-going research vessel. The town of Moss Landing includes marine research facilities, commercial fishing and recreational boating operations, manufacturing and various visitor serving uses. Inland of the Harbor is the Elkhorn Slough National Estuarine Reserve whose tidal exchange flows through the Harbor. From the south, periodic winter flows continue to reach Moss Landing Harbor through the Old Salinas River channel and its tributary, Tembladero Slough; heavy winter river flows together with high tides can produce flood conditions. See Exhibits 1, 2, and 3 attached.

Currently, an abandoned railroad berm runs through the floodplain paralleling the OSR channel south of the harbor, providing flood control for businesses and residential properties along Moss Landing Road. See Exhibit 4 attached. The floodplain area inland of the railroad berm receives limited tidal inundation from the OSR through a small culvert. A pickleweed marsh has reestablished in this area. The railroad berm, built in the later 1800's, has been severely damaged by wave erosion over the past several years.

The proposed flood control berm will parallel and functionally replace a portion of the deteriorating railroad berm. The proposed berm would lie between Watertower Hill, site of the future Moss Landing Marine Lab, and the existing flood control berm on Moss Landing Harbor

District property. The berm would be approximately 620 feet in length, would average 3 feet in height with a maximum of 4 feet, and would be at elevation 7.5 feet National Geodetic Vertical Datum (NGVD). See Exhibits 6 and 7 attached.

The berm will require 1400 cy of fill which may be obtained from soil previously excavated from the adjacent Moss Landing Harbor District Mitigation Plan site immediately to the north. If not available, another source of fill will be sought. The berm will fill 0.158 acres of Corps of Engineers delineated wetland and provide mitigation that restores 0.474 acres of wetland. The construction period is estimated conservatively to be 20 to 25 working days.

The berm construction is located at the intersection of the Commission's original jurisdiction and the Monterey County permit jurisdiction. The permit has been conditioned (Special Condition 5) to require review by State Lands to identify its jurisdiction and permit the development. The berm will also be constructed on property which is deeded to Richard Haake et al. (APN 133-201-16) and to the Peterson Trust (APN 133-201-17). The MCWRA has obtained an easement for the Peterson Trust property. The easement for the Haake (formerly Rubis) property has not been finalized. The permit has also been conditioned (Special Condition 1) to require the MCWRA to submit evidence of the legal right to construct the berm on the Haake property prior to issuance of the coastal development permit. Special Condition 6 requires submittal of any Monterey County approvals required prior to commencement of construction.

The standard of review for the development within the Commission's original jurisdiction is the Coastal Act. The certified Monterey County Local Coastal Program for North Monterey County has also been reviewed and is cited to assure consistency with the County's planning program.

2. **Flooding Hazards**

Coastal Act and Local Coastal Program policies allow for protection of life and property in areas of high flood risk but strictly limit the circumstances under which rivers and wetlands may be altered. The proposed berm is a flood control structure to maintain channelization of the OSR and it will fill 0.158 acres of salt marsh wetland. There must be a demonstrated need for a flood control development and the type, location, material and construction activities must subsequently be determined to be consistent with Coastal Act resource protection policies.

The Monterey County North County Land Use Plan (certified June 1982) defines the 100-year floodplain as a high hazard area. The LUP does not allow for flood control projects to protect new development in the natural flood plain and it does not allow new flood control measures that cumulatively would increase the water surface elevation of the 100-year flood (2.8.3.B).

Historically, the Salinas River joined with the mouth of Elkhorn Slough and emptied into Monterey Bay north of Moss Landing. A reach of the river 5-7 miles long was tidally influenced fresh and brackish water marsh. The system experienced higher volumes and higher quality inflows. Following a series of storms in 1909-1910 the river changed course, creating a second rivermouth at its present location. See Exhibit 2 attached. The river was subsequently diked by farmers. The entrance to the old channel was blocked by the levee and the flow through it controlled by a culvert equipped with a slidegate. In the summer a berm forms across the new rivermouth and the Salinas River Lagoon forms behind it. The Old Salinas River Channel

connects the Salinas River Lagoon with the south end of Moss Landing Harbor approximately 5 miles downstream.

Since the major river flows began discharging to the south, the Old Salinas River has been modified by agricultural activity, construction of the harbor, maintenance dredging and hydraulic structures. The Old Salinas River carries periodic flows from the Salinas River Lagoon, major inflows from Tembladero Slough, and agricultural discharge via subdrains from the adjacent fields. Outflows from OSR to Moss Landing Harbor occur through a series of 13 culverts at Potrero Road, equipped with flap gates on the harbor side to restrict tidal flows into the Old Salinas River.

The proposed development is located on the floodplain of the east bank of the Old Salinas River Channel downstream of the Potrero Road tidegates and upstream of Sandholdt Road Bridge which demarcates the south end of Moss Landing Harbor. Tidal flows and Old Salinas River flows meet in this area.

Currently, an abandoned railroad berm runs through the floodplain paralleling the OSR channel and the proposed berm site. See Exhibit 4 attached. The railroad berm was believed to be constructed in the late 1800's as a railroad foundation. Presently, it serves as the only flood control structure along these properties between the Old Salinas River and the business and residential district along Moss Landing Road. Previously a small culverted opening approximately eight hundred feet south of the project site allowed high tidal flows in limited volumes to reach the salt marsh. A current field review by the consultant and Commission staff (November 3, 1997) revealed major breaks in the berm allowing significantly more water behind the berm both south and north of the culvert area. A single family residence and farm outbuildings are located on the Rubis Ranch property. The office for the North Monterey County Unified School District is located on the District's property. The proposed flood control berm will be constructed between 200 and 300 feet east and parallel to the railroad berm. It will functionally replace the railroad berm. The new berm would meet Watertower Hill to the south and connect to the Moss Landing Flood Control Berm to the north.

The hydrologic environment is controlled by seasonal rain, late season freshwater runoff from agricultural fields and tidal inputs. Seasonal rain is extremely variable. During the heavy storms in the winter of 1982-83 the railroad berm failed, flooding the adjacent fields and the town of Moss Landing during high tide sequences. Because of local and regional drought, there were no major local flooding incidents between 1982 and 1995. The major floods of 1995 impacted large areas of the Salinas River floodplain including the southern reaches of the Old Salinas River. However, Moss Landing itself did not flood in 1995.

Gilchrist and Associates, the project consultant, explained the differences in conditions between 1982-83 and 1995 in a letter report dated October 16, 1997. See Exhibit 9 attached. "Due to funding limitations for the flood control berm project, the MCWRA has not prepared a hydrologic analysis to precisely delineate a 100-year flood elevation for this project. However, various information sources do indicate that a flood hazard" occurs in this location when there is a combination of high runoff down the OSR (the major flow from Tembladero Slough) and a high tidal event in Monterey Bay. The railroad berm is +4 feet NGVD or 2 feet above the marsh plain. The town of Moss Landing is also approximately 4 to 5 feet NGVD. During periods of high OSR flows which coincide with extremely high tides, the berm is overtopped. In January 29, 1983 a mean daily flow (peak flow not available) of 450 cubic feet per second coupled with

a high tide of 6.5 feet topped the berm near the site and flooded the town of Moss Landing. However, on March 10, 1995 when the high mean daily flow was 377 cfs with a peak discharge of 659 cfs, the tide was between 2.3 and 3.4 and no flooding occurred on this section of river.

The report concludes that a large runoff volume down the Old Salinas River during flood periods can add 2 to 3 feet to the water surface elevation, causing flooding up to the 6 to 7 foot NGVD elevation during extreme high tides. The consultant acknowledges that a complete hydrologic modeling effort would be needed to fully document all variables but concludes that the simplified analysis does indicate that construction of a berm at the 7.5 NGVD elevation (allowing for about ½ foot subsidence) is necessary for flood protection.

Section 30253 of the Coastal Act provides, in part, that new development shall minimize risks to life and property in areas of high geologic, flood, and fire hazard. Section 30236 provides for flood control projects where necessary for public safety or to protect existing development. The applicant has demonstrated that the area is subject to flooding which could impact the safety of the public and existing development in the town of Moss Landing. Therefore, the proposed development as it relates to need is consistent with Sections 30253 and 30236 of the Coastal Act.

3. **Rivers and Wetlands/Allowable Types of Use**

Historically, the proposed berm site was part of a longitudinal band of a marsh system that bordered the lower Salinas River as it flowed north to its former mouth, approximately 1.5 miles north of the Harbor entrance. The dike system created after 1910 reduced freshwater inflow into the Old Salinas River Channel and caused significant redistribution of habitat types from freshwater marsh to salt marsh. Both the west and east banks of the Old Salinas River Channel, between Potrero Road to the south and Sandholdt Road to the north, contain extensive mudflats and salt marsh habitat.

The abandoned railroad berm runs through the floodplain paralleling the OSR channel south of the harbor and serves to channelize the river. The proposed berm will be constructed parallel to the railroad berm at distances from it of approximately 100 to 300 feet. The floodplain area inland of the railroad berm receives restricted tidal inundation from the OSR through eroded sections of the berm.

A Moss Landing Flood Control Wetland Delineation was done by John Gilchrist and Associates in February 26, 1997 and field confirmed by the U.S. Army Corps of Engineers (File No. 19044S) on June 27, 1997 and issued on July 28, 1997. The proposed berm will be constructed primarily on upland grasslands but will fill 0.158 acres of healthy non-tidal salt marsh wetland and will separate a small section of higher elevation (probably fresh water wetland) from the lower elevation salt marsh. Additionally, if the freshwater runoff from the upper site is restricted by the new berm both the freshwater and saltwater wetlands may be impacted. Finally, the abandonment of the railroad berm and its deterioration could impact the quality of the balance of the wetland that lies between the two berms.

The Commission has defined wetlands, coastal rivers and streams and their riparian corridors as environmentally sensitive habitat (Section 30240) and the proposed development will alter the bank or former bank of the Old Salinas River and impact a wetland. A flood control project is not one of eight

allowable uses in open coastal waters, wetlands and estuaries under Section 30233(a) of the Coastal Act. However, the Coastal Act does allow flood control projects if necessary. Section 30236 of the Coastal Act provides:

> Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to.... (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, ...

The proposed development is located in the floodplain and along the bank of the Old Salinas River. Wetlands are commonly associated with the perimeters of river systems where flood control structures may be necessary. At this location the Old Salinas River channel and its associated wetlands have long been a manipulated system. The proposed flood control berm will join an existing flood control structure at approximately the same elevation along the river floodplain and will replace an existing manmade berm located 200 to 300 feet on the interior of the river channel. The new berm will more closely follow the natural channel than the existing berm and with the further deterioration of the railroad berm the river will reclaim the area.

Pursuant to Section 30236 of the Coastal Act flood control facilities are an allowable type of use on water courses. Though Section 30233(a) does not specifically identify a flood control facility as an allowable type of use in a wetland, when evaluated within the context of the flood control system, the proposed flood control berm is necessary for the protection of existing development and to provide for public safety and will in the long term provide for a more natural wetland system in this area. Therefore, the proposed development as a type of use is consistent with the Coastal Act.

4. **Analysis of Alternatives**

The Coastal Act provides that a flood control structure is a type of use that may be permitted in coastal waters and wetlands. However, the Act requires that there be no other feasible alternative (Section 30236) when altering a river and that there be no feasible less environmentally damaging alternative (Section 30233) when impacting a wetland.

Alternatives to the flood control berm or its location were discussed in a document prepared by the MCWRA staff (July 1994) Alternative Analysis and Mitigation Plan, Moss Landing Flood Control Berm and Mitigation Area and subsequently in the CEQA review (Negative Declaration July 1997). The following alternatives were considered:

- **No project**: According to the study the existing railroad berm is inadequate and Moss Landing will be subject to winter flooding such as occurred in 1982-83. Past flooding was substantial and caused business loss and property damage. The possibility exists that flooding will occur annually and several times in one season. This alternative would not provide for flood protection and is, therefore, not a feasible alternative.

- **Repair of Existing Railroad Berm**: The railroad berm has been severely damaged by wave erosion over the past several years and is in need of ongoing maintenance. According to the MCWRA (MCWRA letter October 19, 1994), "the responsibility to repair or modify the railroad berm belongs to the individual property owners. Because of severe

erosion damage and a large break [the break has been repaired] in the berm it is no longer feasible for the owners to attempt repairs." In addition, because of its small size and deteriorated condition, the berm top itself cannot support the heavy equipment needed for repair. The only other access for repair trucks would be across the adjacent salt marsh which would have ongoing unacceptable impacts to the resource. Hence, the analysis determined that repair of the railroad berm is not a feasible alternative for flood protection.

- **School District Alignment**: In this alignment the northern portion of the berm would be located across the western end of the North Monterey County School District property. The majority of the berm would be located over pasture land and through a line of trees adjacent to a driveway and would require minimal burial of salt marsh habitat. However, the alignment would require acquisition of school district property which is opposed by the school district and could require condemnation of the property and potentially lengthy litigation. The alignment would also require the removal of five cypress trees which are used for bird roosting. This alignment would require several ninety degree turns and additional engineering and would result in the loss of approximately 0.025 acres of wetlands. The analysis concluded that the school district alignment was not a feasible alternative.

The Alternatives Analysis concluded that the "No Project" alternative would leave Moss Landing exposed to potential flooding and that repair of the failing railroad berm alternative would require repeated episodic access across the marsh resulting in substantially more wetland damage and would not be a permanent solution to flood control. The School District Site alternative would impact minimal salt marsh but would require condemnation of property with a possible lengthy legal process which would leave Moss Landing exposed to possible flooding, a poor alignment to the existing berm system, and the loss of several cypress trees. The analysis concluded that none of the alternatives was feasible.

- **Reduced Berm Footprint**. At the time of the July 1994 Alternatives Analysis, the berm was proposed to cover 0.210 acres of wetland. In response to comments from the Department of Fish and Game the berm was redesigned to reduce the footprint by reducing the back berm slope from 3:1 to 2:1, thereby reducing the amount of wetland fill to 0.158, the minimal possible consistent within engineering constraints.

The Department of Fish and Game and the U.S. Army Corps of Engineers have reviewed the Negative Declaration and the Moss Landing Berm Wetland Mitigation Plan, Gilchrist and Associates, July 1997, (discussed below) and have found the berm location and size acceptable.

It is also relevant that the proposed flood control berm is both a replacement structure and a component of an existing flood control system. The proposed development does not initiate alteration of an undisturbed natural system but must be developed within the context of existing flood control structures and existing development. The option to create the least environmentally damaging alternative, e.g., completely outside the wetland areas, is not feasible.

The applicant has presented an analysis that supports the conclusion that the berm size and location is the least environmentally damaging alternative for flood control in this area.

Therefore, as to size and location, the proposed development is consistent with Section 30236 which allows for alteration of rivers for flood control purposes when no other feasible alternative is available and with Section 30233, which requires that to fill wetlands there must be no feasible less environmentally damaging alternative

5. **Mitigation Restoration**

In addition to determining that the proposed size and location are the least environmentally damaging feasible alternative, the construction materials and activities and the mitigation restoration plan must be found to be consistent with Coastal Act policies to minimize impacts on resources.

Coastal Act Section 30233 requires that diking, filling or dredging in existing estuaries and wetlands shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation and that the functional capacity of the wetland or estuary shall be maintained or enhanced. Section 30236 requires the best mitigation measures feasible when altering rivers or streams and Section 30240 protects against significant disruption of habitat values.

The proposed flood control berm has a long history. Several studies have been done to determine the existing habitat values. A Biological Assessment of Flood Control Dike at Old Salinas River, Moss Landing was prepared by ABA Consultants in September 1989 and included a habitat survey of the area where development impacts would occur and where mitigation for the project would be proposed. Other evaluations include An Erosion Control Management Plan, MCWRA, October 1990; Alternative Analysis and Mitigation Plan, Moss Landing Flood Control Berm, MCWRA, January 1993 and July 1994. A Wetland Delineation Moss Landing Flood Control Berm, HRG, 1995 and a Wetland Delineation by John Gilchrist and Associates, 1997, also documented site vegetation. Most currently a Revised Moss Landing Berm Wetland Mitigation Plan by John Gilchrist and Associates was completed in October 1997.

The studies found that numerous species of shorebirds and waterfowl are common in this part of the Old Salinas River including willets, long-billed curlews, marbled godwits, sanderlings, western sandpipers, and several gull species. Large mammals commonly found include raccoons, muskrats, opossum, red and gray fox, rabbits and deer. Weasels, squirrels, moles, shrews, bats gophers and voles are also found. The most common marine mammals are harbor seals who swim along the Old Salinas River and probably feed there and periodically haul out. The Elkhorn Slough region has several species of fauna currently listed as threatened or endangered by state or federal government. Species that may occur near or on the study site include the California clapper rail, the Santa Cruz long-toed salamander, American peregrine falcons, California brown pelicans, the black shouldered kite, snowy plover and least tern. The California sea otter also maintains a small population in the slough system. The California brackish-water snail inhabits the nearby Moro Cojo Slough mouth. None were found on the project site.

Vegetation in the study area fell into distinct zonation patterns which generally correlated with elevation above mean sea level. A cross section of the general area showed mudflats at the river, pickleweed on the lower banks of the railroad berm and fat hen and alkali heath with salt grass higher up. The railroad berm had bands of vegetation including pickleweed, fat hen and

alkali heath with salt grass higher up. The top of the berm contained salt marsh and uplands plants, e.g. salt grass, mustard, dock, coastal gum bushy, dune grass and rabbits foot. The trough between the railroad berm and the proposed flood control berm site contained bands of pickleweed and pickleweed/fat hen/salt grass. The proposed berm site contains pickleweed/fat hen/salt grass and winter grass. The area inland of the proposed berm site is winter grass with patches of pickleweed. Pickleweed marsh (Salicornia virginica, a wetland indicator specie) covered 90% of the study area. See Exhibit 5 attached.

The October 1997 Moss Landing Berm Wetland Mitigation Plan by John Gilchrist and Associates (Mitigation Plan) reported wetland losses and proposed wetland restoration. Exhibits 6 and 8 attached illustrates the areas. The following outlines wetland losses and restoration mitigation.

Area of Wetland Loss	Acres
Salt Marsh Near School	0.156
Drainage Ditch	0.002
Total Loss	0.158

Proposed On-Site Mitigation	Acres	Description
Salt Marsh Restoration	0.223	Lower mitigation area by one to two feet and replace non native grasses and wild radish with salt marsh habitat adjacent to existing salt marsh.
Restoration at Sand Dune Deposit	0.251	An upland sand dune deposit 1.5 to 2 feet higher than marsh is vegetated with ruderal grasses and herbaceous species. The upland will be excavated 1 to 2 feet and revegetated with salt marsh species.
Revegetation of Proposed Lower Berm with Wetland Vegetation	Not included as mitigation.	Upper berm will be vegetated with native bush lupine, coastal gum bush, and alkali rye grass. Lower berm will be revegetated with salt marsh species.
Abandon existing railroad berm.	Secondary benefit.	Berm currently supports mature community with wetland vegetation. It will be allowed to naturally erode and create "islands" with increased habitat heterogeneity.
Total Mitigation	0.474	

The Mitigation Plan achieves (1) like-for-like habitat replacement - salt marsh is being destroyed and salt marsh is being replaced; (2) no net loss; existing wetlands are not being used to mitigate for loss of another wetland; (3) no net loss; an equal or greater acreage is being created. The ratio of wetlands restored to wetland lost is 3:1. In addition, the created wetland is directly adjacent to existing wetland increasing the probability for success.

The berm is designed with two culverts to allow continued fresh water flow into the channel. Flapgates will prevent salt water inflow. See Exhibit 6 attached.

Some of the important details of the Mitigation Plan are: the Mitigation Plan uses baseline data from an adjacent reference site to establish performance standards; a performance standard greater than or equal to 90% vegetative cover will be used; the existing elevations of the undisturbed salt marsh will determine elevations for the proposed mitigation areas. construction impacts will be controlled by fencing and flagging and by the presence of a qualified biologist on site during grading to ensure that work is completed consistent with approved plans and conditions; soils will be tested for appropriate plantings; existing vegetation that is salvageable will be saved for revegetation; the site will be revegetated with plants appropriate for the elevation; wildlife surveys will be conducted twice a year in spring and fall to correspond to nesting and migration periods; the site will be monitored and maintained for five years or longer if needed to assure restoration success; records will be maintained of progress; and annual monitoring reports will be submitted to the Corps of Engineers, Coastal Commission and Monterey County Planning Department.

The applicant proposes to use dredge materials from the adjacent Moss Landing Harbor District site. However, it is not clear that this fill will be available. The permit has been conditioned to require that only clean fill material shall be used for the berm, that the permittee identify the source of the fill and shall provide an analysis of its grain size and subsequent analysis for contamination if needed with review by the Department of Fish and Game. See Special Condition 2.

In the short term, in non-flood conditions, the proposed berm will have little if any effect on the OSR and its channel since the existing railroad berm will not be altered. In the long term the railroad berm will further deteriorate, creating islands surrounded by Salicornia marsh, and establishing the new berm as the inland extent of the channel. The islands will attract large numbers of resting and feeding birds. The Mitigation Plan expects that the overall health of the salt marsh will improve and normal drainage patterns will be re-established. Hence, the construction of the new berm and abandonment of the old berm may allow the river to more closely reclaim its old channel. Also see Finding 6, Coastal Erosion, below.

The applicant has designed and located the proposed flood control berm in the best feasible way, has provided a wetland mitigation plan that reduces impacts to the minimum feasible, and has included a monitoring program to evaluate the programs success and rectify problems.

A Preliminary 160l Stream Alternation Agreement has been issued by the Department of Fish and Game. The Agreement requires conformance with the Wetland Mitigation Plan with several conditions including limitation on elevations of grading. The permit is conditioned to required submittal of and conformance with the Final 1601 Stream Alteration Agreement and Executive Director review and approval of the final plans. Fill material analysis of grain size and potential contamination, and grading and construction plans are to be reviewed and approved by the Environmental Monitor and the Department of Fish and Game before submittal to the Executive Director. Comments from the Corps have not been received. The permit has been conditioned to require U.S. Army Corps approval prior to commencement of construction. See Conditions 2, 3 and 6.

The permit has also been conditioned to require an environmental monitor to report on the construction of the berm and do follow up monitoring and reporting. At the conclusion of the five year monitoring and maintenance period, a report shall be provided to the Executive Director for review and approval, which either documents the successful establishment of the

approved restoration plan or provides for an extended monitoring program, including appropriate corrective actions, which shall be implemented until successful establishment of the approved plan has been achieved to the satisfaction of the Executive Director. See Special Condition 4.

North Monterey County Land Use Plan Policy 2.4.2.2 provides that in order to prevent further reduction in the size and quality of remaining wetlands habitat, diking, dredging, or filling are to be limited to the minimum required for allowable uses and are permitted only when an equivalent area of new or degraded wetlands within the same estuarine system is created or restored in a manner which maintains or enhances overall biological productivity. These LCP policies reflect Coastal Act policies and the Commission's findings and conditions assure compliance with the LCP.

Therefore, in conjunction with Finding 6 below and as conditioned, the proposed development is consistent with Coastal Act Section 30233 which requires that diking, filling or dredging in existing estuaries and wetlands shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation and that the functional capacity of the wetland or estuary shall be maintained or enhanced; with Section 30236 which requires that flood control projects shall incorporate the best mitigation measures feasible for alterations made to rivers or streams; and with 30240, which protects against significant disruption of habitat values.

6. **Coastal Erosion**

Section 30253 states in part:

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

Section 30231 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.

Erosion of Wetlands/Previously Proposed Alternative Mitigation Area: The Commission approved a 1300 lineal feet riprap bulkhead on the west bank of South Moss Landing Harbor (3-88-47) in 1988. Coastal development permit jurisdiction was split with Monterey County and the County approved its portion of the project under permit PC-6524. As mitigation for the

proposed wetland fill and for unauthorized activity involving the filling of jurisdictional wetlands within the Moss Landing Harbor District, the permits required a wetland restoration program. The restoration project site was the Moss Landing Harbor District Mitigation project on the parcel north of the subject site of this permit application. See Exhibit 10 attached. The Commission reviewed the restoration mitigation under its permit conditions. Monterey County reviewed and permitted the restoration under PC 6930 (August 1989). The County further required as a condition of PC 6930 the completion of the proposed flood control berm system through to Watertower Hill and the abandonment of the railroad berm.

The September 1989 Biological Assessment of Proposed Flood Control Dike at Old Salinas River, Moss Landing by ABA Consultants reported as follows:

> Although periodic flooding is a major problem around Old Salinas River, the most important environmental problem within the main Elkhorn Slough system is erosion of wetlands. We briefly summarize this erosion to indicate potential problems along the Old Salinas River that have not been taken into account in past planning. The primary erosion was caused by the construction of Moss Landing Harbor and the maintenance of the harbor entrance at the slough's mouth since 1947. The pre-harbor slough was a shallow estuarine embayment with mild tidal currents and no intertidal flats (Schwartz et al. 1986). The harbor opening exposed large areas of intertidal mudflats. It scoured the slough with strong tidal currents (over 50 cm/sec, Clark 1972, Smith 1973) eroding every major sedimentary habitat. The main channel increased from less than 7 m in width to 125 m and from 1 m in depth to 7 m. Tidal creeks in the marshes increased in width an average of 72% from 1931 to 1980, when the cover of salt marsh plants decreased from an average of 92% to 69%.
>
> Rates of erosion increased during the present decade with breakage of dikes surrounding five former wetlands (pastures and salt ponds). The diked areas added 2.8 km of new wetland to the slough, and almost doubled the total volume of water in the slough at high tide. Tidal creeks draining natural marshes increased in size by 18% from 1980 to 1987; and increased 74% in creeks draining habitats with broken dikes. During the same time, the cover of vegetated salt marsh decreased by 8%. The rate of wetland loss from 1980 to 1987 was significantly greater than the rate from 1931 to 1980. Dike breakage was a planned and unplanned strategy for restoring salt marshes, which unfortunately accelerated habitat loss. These dramatic patterns of erosion caused important changes in biological communities. Extensive eel grass habitat was eroded; freshwater vegetation and anadromous fishes disappeared; and native bird, fish, and invertebrate communities were replaced by more marine assemblages (Gordon 1977, Nybakken et al.1977, Oliver et al. 1989).
>
> The removal of the dike and excavation of channel and mudflat habitat at the harbor mitigation site must be considered in the broader context of wetland erosion in Elkhorn Slough.

The ABA discussion documents the serious impacts that accelerated erosion is having on Elkhorn Slough and the potential for unmitigatable erosion in the Old Salinas River. The Assessment commented on the adjacent Harbor Mitigation Project (at that time not constructed) and warned that though the purpose was to create channel and mudflat habitat, planning did not consider the extensive erosion problems in the entire Elkhorn Slough system.

Newly excavated channels may act as erosion centers and once salt marsh is eroded there is no depositional process to replace it. Because of the potential for erosion the Assessment recommended that the available on site mitigation for the proposed flood control berm, removal of the railroad dike, not be pursued but that a regional mitigation bank be established.

The flood control berm extension to Watertower Hill was approved by Monterey County under permit PC-7636 for in May 1991. The County found that because most of the site was already salt marsh or wetland, it was not possible to fully mitigate for the new berm on site as required, and recommended off-site mitigation on property owned by the Elkhorn Slough Foundation. The proposed mitigation site was a 16 acre site on the east side of Highway One bordering the main channel of Moro Cojo Slough.

In May 1991 the Army Corps of Engineers circulated a Public Notice (19044S27) for the project. The Corps reviewed an ABA mitigation plan dated November 1990 and determined that it was only conceptual and that a wetland delineation and a specific mitigation site was required. It was also determined that the berm was partially within the Coastal Commission's original jurisdiction. The Monterey County Permit was not exercised.

The Department of Fish and Game does not support off-site mitigation. Subsequent mitigation plans were prepared and processed which did not propose offsite mitigation. The current Revised Moss Landing Berm Wetland Mitigation Plan, John Gilchrist and Associates, October 1997, identified on site areas of mitigation that have been accepted by the U.S. Army Corps of Engineers and the Department of Fish and Game.

Regarding the potential for increased erosion from the proposed flood control berm project, the proposed Wetland Mitigation Plan leaves the existing railroad berm undisturbed as recommended in the ABA assessment and will allow for its gradual deterioration. It also does not alter the east/west section of the Harbor District Mitigation Site berm though that section of berm is deteriorating. Since the proposed project does only minor excavation in a small area to alter the elevation to provide the correct hydrology for sustaining salt marsh and does not remove any of the existing earth structures that are slowing erosion along the banks, it is not expected to directly impact the erosion rates.

Therefore, the proposed project is consistent with Section 30253(2) which requires that new development neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area, and with Section 30231 which protects the biological productivity and quality of coastal waters and wetlands appropriate to maintain optimum populations of marine organisms by, among other means, controlling runoff and substantial interference with surface water flow.

7. **Public Access**

The proposed berm is located between the first public road and the sea and in proximity to public recreational areas.

Coastal Act Section 30210 provides:

> 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 resources areas from overuse.

Section 30211 protects existing access to the sea where acquired through use or legislative authorization. Section 30212 provides for establishment of public access from the nearest public roadway to the shoreline and along the coast in new development projects except where it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, or where adequate access exists nearby, or where agriculture would be adversely affected.

The berm has been designed to allow for vehicular access for performance of necessary maintenance and for emergencies. Unauthorized vehicular access will be controlled by a gate and fence at Sandholdt Road.

In order to protect wetland resources, the North Monterey County Land Use Plan, Site Specific Recommendations for Access Areas, does not provide for access or trails to or along the Old Salinas River in this area. However, pedestrian access is currently permitted at the northerly adjacent Moss Landing Harbor District Mitigation site where a flood control berm and wetland restoration project were approved by the Commission in 1988. A public observation area approximately 600 feet to the north will be developed as part of that mitigation program.

According to the Wetland Mitigation Plan pedestrian access to the proposed MCWRA flood control berm will be allowed though not encouraged. Foot access would be from surrounding properties with landowner permission or through the gate on Harbor District property. Low level pedestrian traffic is not expected to seriously interfere with vegetation establishment as the berm's location will tend to limit use to local residents. If in the future, a trail network to the Salinas River State Beach and/or Moss Landing State Beach is developed, this berm could be incorporated into the system. However, a analysis of impacts on wildlife and habitat would need to support the proposed use and level of use.

At this time applicant has not secured legal interest to develop the berm on the Haake property and the terms of the legal interest and whether it will permit access have not been determined. There is little if any public use of the site and public prescriptive rights do not exist. Hence, the proposed berm will not impact existing access.

The proposed development does not specifically provide for public access and the presence of important wetland resources requires protection from overuse for consistency with Section 30210 and 30212 of the Coastal Act. If in the future it is determined that access is appropriate, nothing in the proposed development design precludes the future use of the berm as a segment of a formal public system if one is established. The applicant is encouraged to participate with the Moss Landing Harbor District, the Moss Landing Marine Lab, and the State Department of Parks and Recreation in any future efforts to plan and implement an access system that would include the berm.

The development of the access system would require coastal development permits from the County of Monterey or the Coastal Commission. Therefore, as conditioned, the proposed

development has the potential to improve public access if found appropriate and is consistent with the Public Access and Recreation policies of the Coastal Act.

7. **Local Coastal Program/Wetland Management Planning/CEQA**

The section of the Old Salinas River Channel that is the subject of this permit is a small part of a larger hydrologic and ecologic system. The North Monterey County Land use Plan certified by the Commission in June 1982 designates the Old Salinas River Channel Resource Conservation, Wetlands and Coastal Strand (p.69). The Resource Conservation designation emphasizes the protection of sensitive resources, plant communities, and animal habitats. This land use is applied to wetlands, dunes, and riparian corridors under the Wetlands and Coastal Strand Category, and to sensitive forest and upland habitats. Only very low intensity uses and supporting facilities compatible with protection of the resource are allowed.

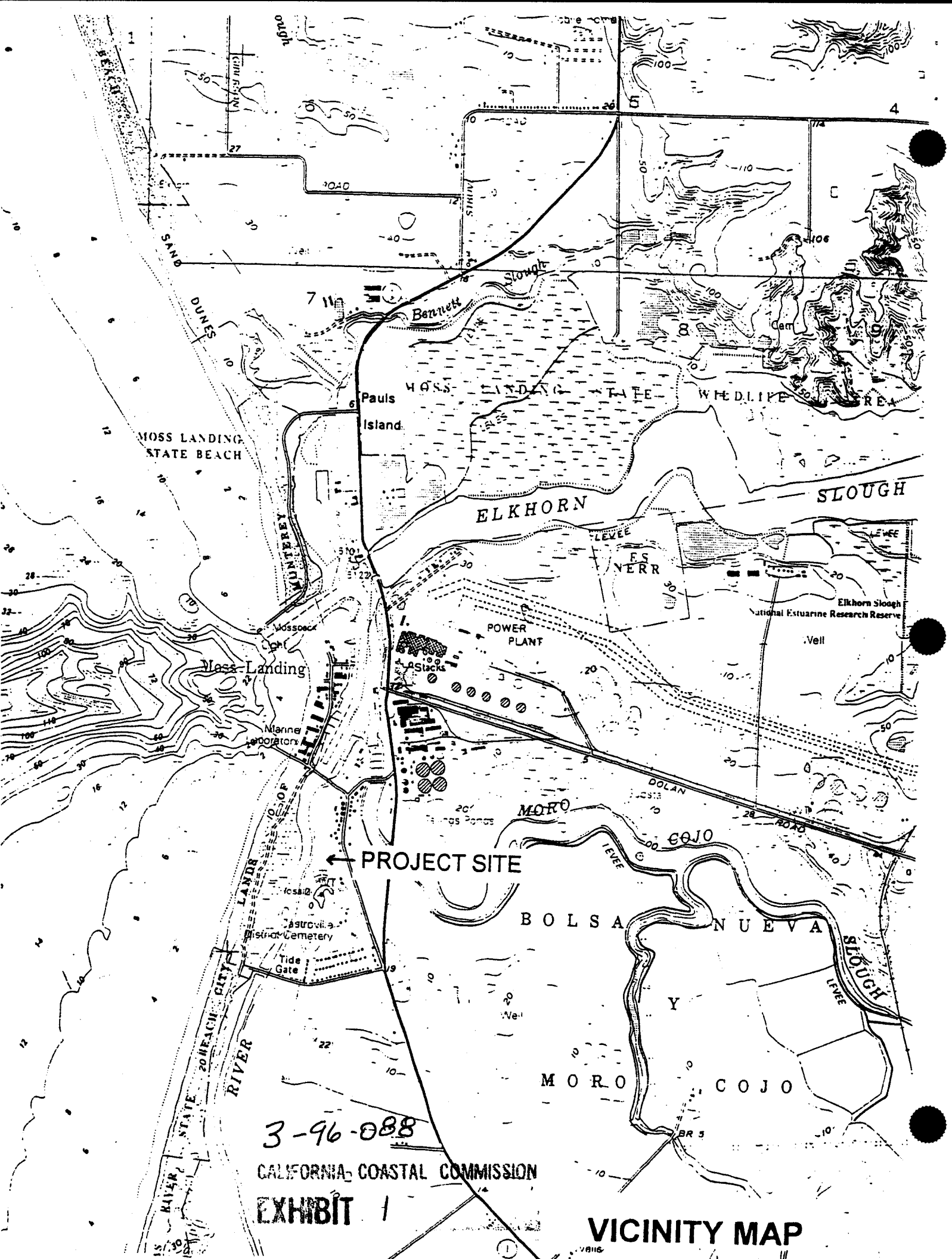
The LCP provides for protection of plant and wildlife values of all wetland areas, for development of a comprehensive natural resources and water basin management plan for North County and wetland management plans for the sloughs and estuarine areas.

Specifically, Policy 2.3.4.2 states that a comprehensive wetlands management plan should be completed for the Bennett Slough, Moro Coho Slough, Elkhorn Slough, and the Old Salinas River estuarine areas.

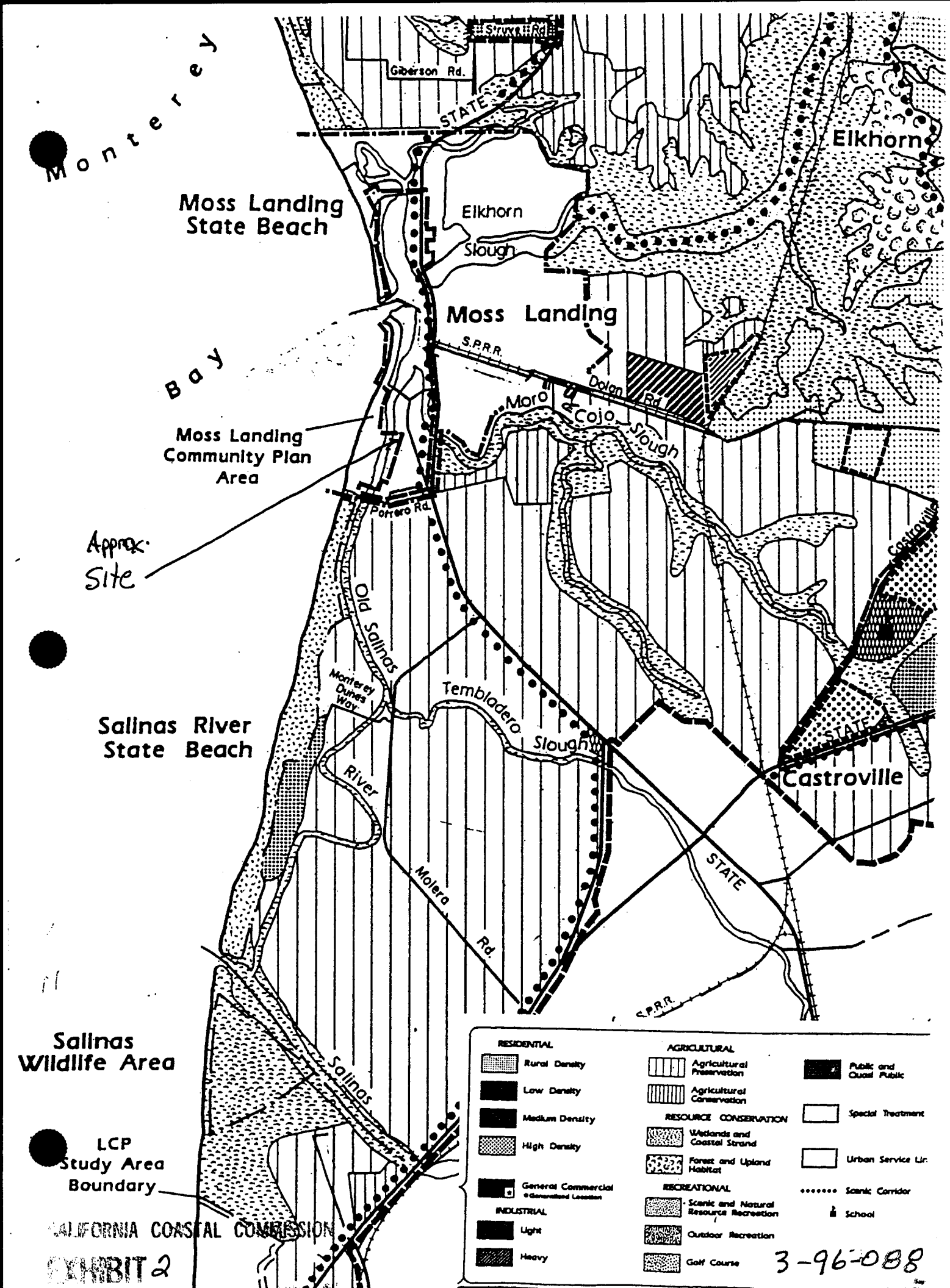
The Commission's ReCap surveyed all the wetlands in the Monterey and Santa Cruz Countie's coastal zone. Eighteen of the twenty five wetlands were subject to management plans; the Old Salinas river was one of the largest still lacking one. Thus, ReCAP recommends that management plans be prepared for those wetlands lacking them.

Unfortunately efforts to achieve comprehensive planning for the Old Salinas River wetlands have not been successful. Wetland restoration has been on a case-by-case basis either as mitigation for permitted development projects or to remedy violations from unpermitted projects. The Commission encourages the MCWRA to pursue and participate in future comprehensive management of the OSR channel.

A Negative Declaration was adopted for the proposed Harbor District flood control berm on July 2, 1997. As conditioned there are no additional feasible mitigation measures which would significantly lessen any adverse environmental impacts of the proposed project; the project will not cause any significant adverse environmental impacts within the meaning of CEQA.



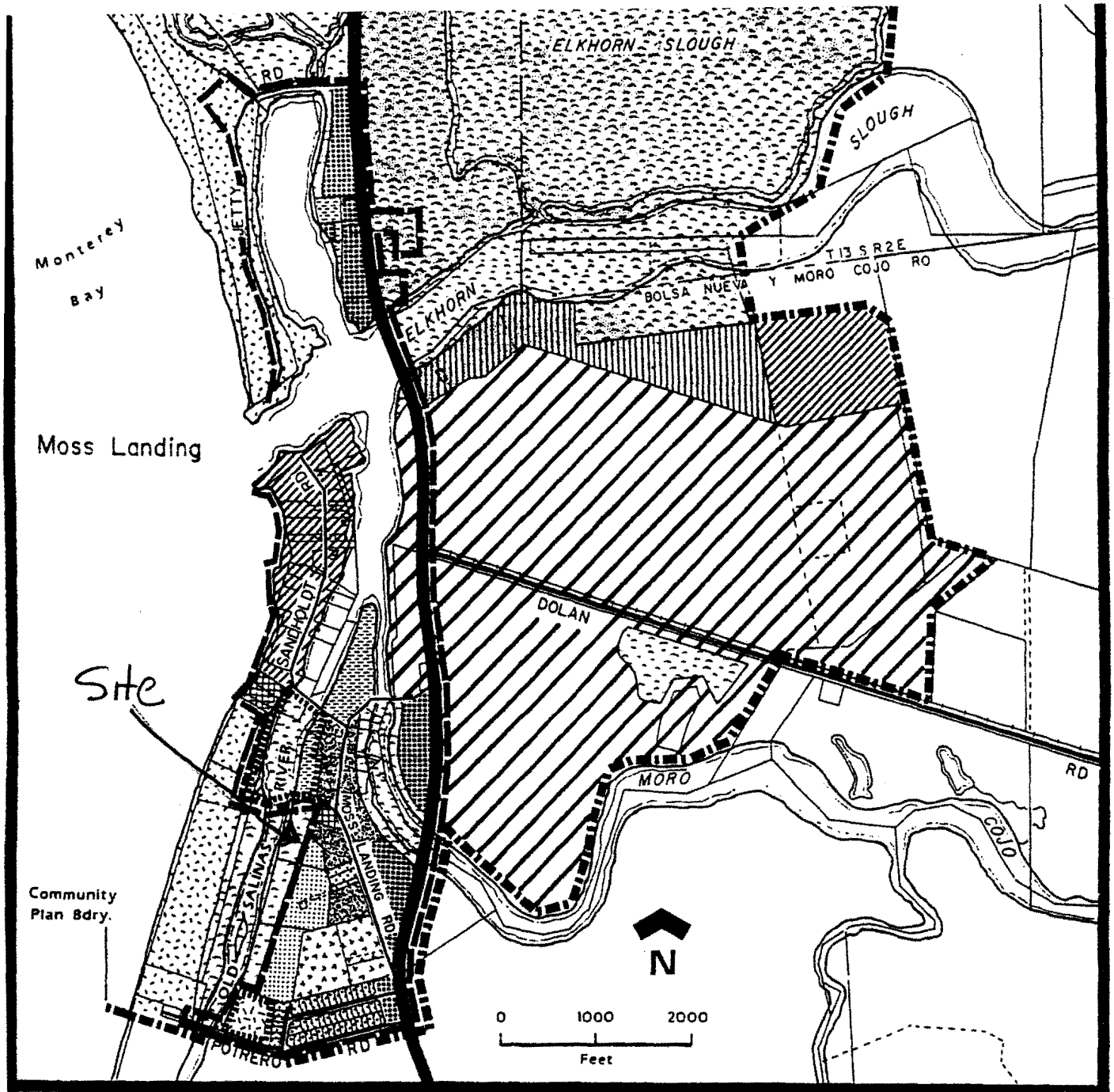
VICINITY MAP



CALIFORNIA COASTAL COMMISSION

EXHIBIT 2

3-96-088



MOSS LANDING COMMUNITY PLAN

INDUSTRIAL - Coast Dependent
- Light
- Heavy

RESIDENTIAL
- Low Density
- Medium Density

COMMERCIAL
- Recreation & Visitor Serving
- General

PUBLIC/QUASI-PUBLIC
- Harbor Facilities
- Educational - Scientific
- Cemetery

AGRICULTURAL/ AQUACULTURAL
- Agricultural Conservation
- Aquaculture (overlay)

RECREATIONAL
- Scenic & Natural Resource Recreation
- Outdoor Recreation

RESOURCE CONSERVATION
- Wetlands & Coastal Strand

SPECIAL TREATMENT

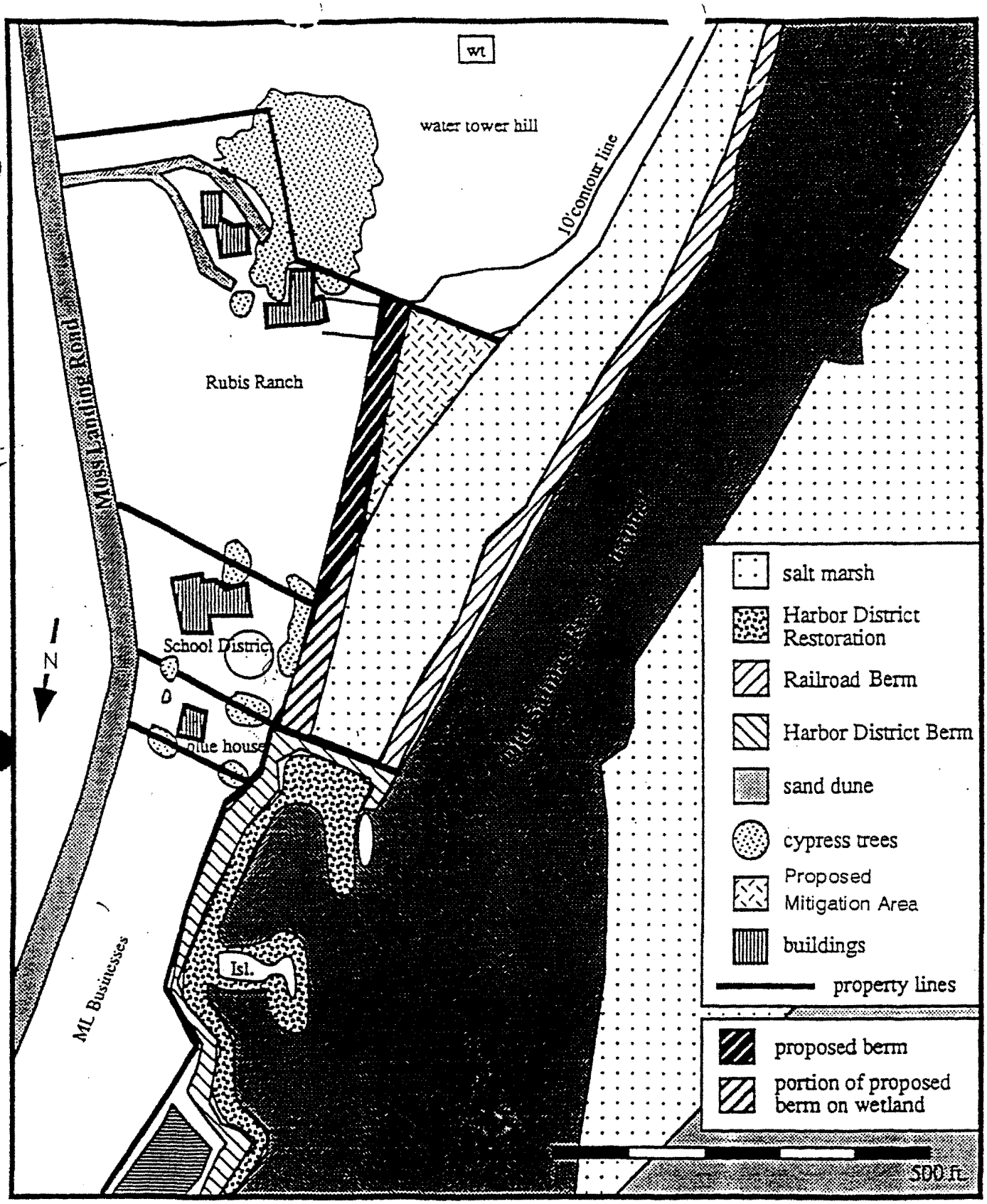
URBAN SERVICE LINE

CIRCULATION
- 4 Lane Divided Scenic Highway
- 2 Lane County Road
- Proposed Road

Prepared by Monterey County Planning Department from Jefferson Associates Moss Landing Community Plan.

FIGURE 2

3-96-088
CALIFORNIA COASTAL COMMISSION
EXHIBIT 3



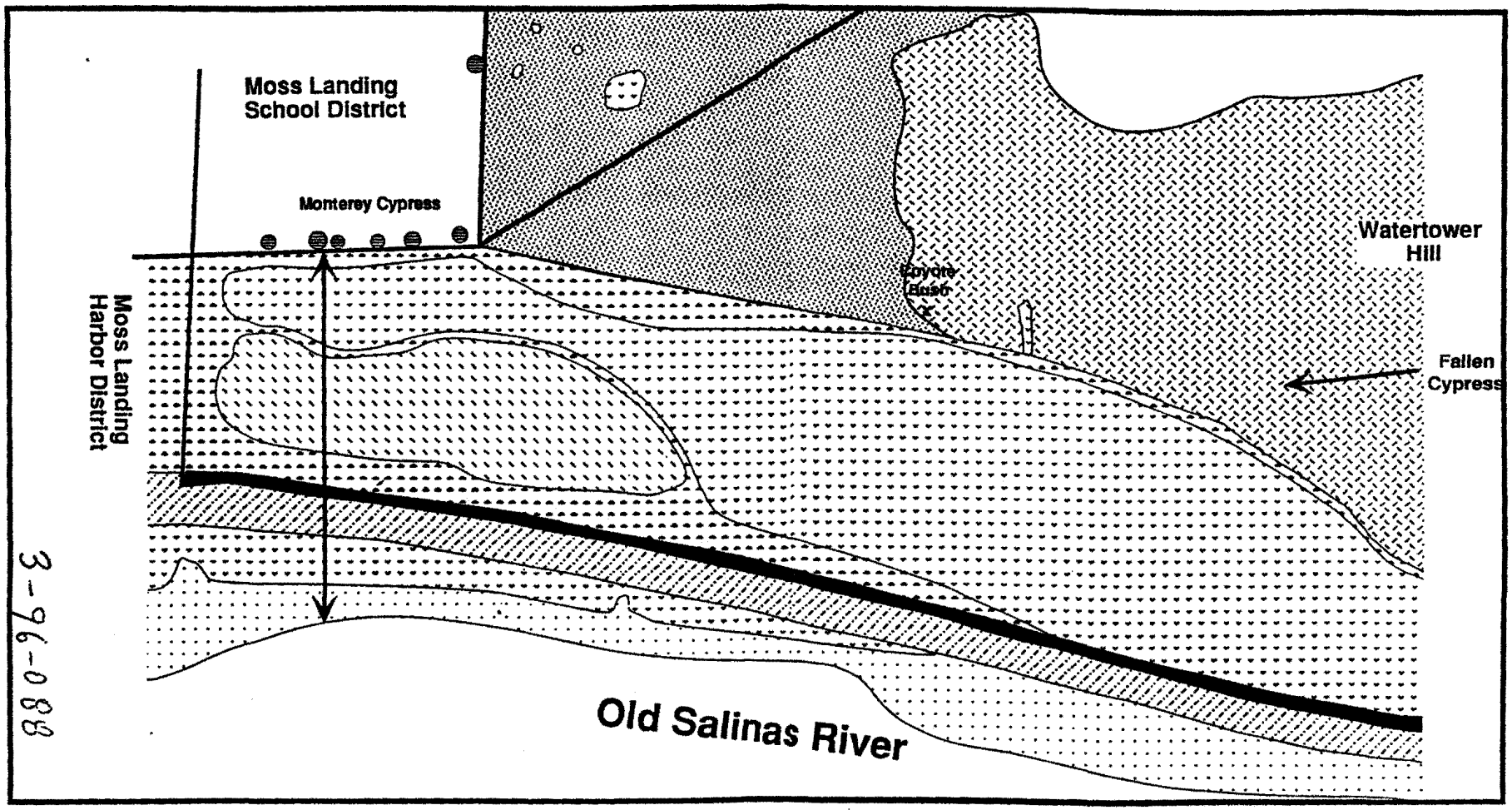
Alignment of the proposed berm presented in alternative 3, the preferred alternative. The northern portion of the berm will bury wetland.

Schematic; Represents Surrounding Features. Does Not Represent Revised Berm And Mitigation Areas. See Exhibit 6; Site Plan/Restoration Plan.

3-96-088

CALIFORNIA COASTAL COMMISSION

EXHIBIT 4



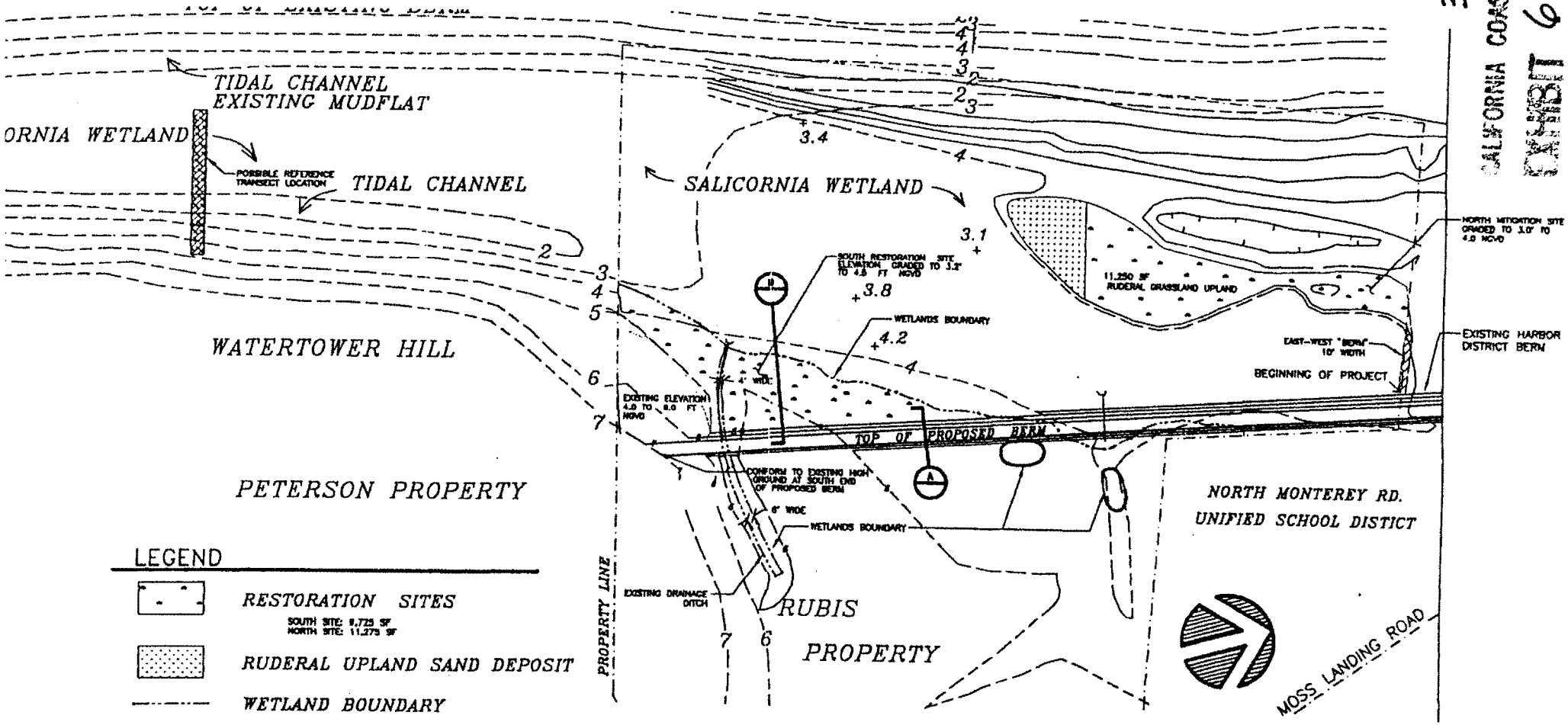
VEGETATION MAP

Revised by Gilchrist and Associates to Reflect Current Conditions 11/4/97

Consultants

3-96-088

CALIFORNIA COASTAL COMMISSION
EXHIBIT 5



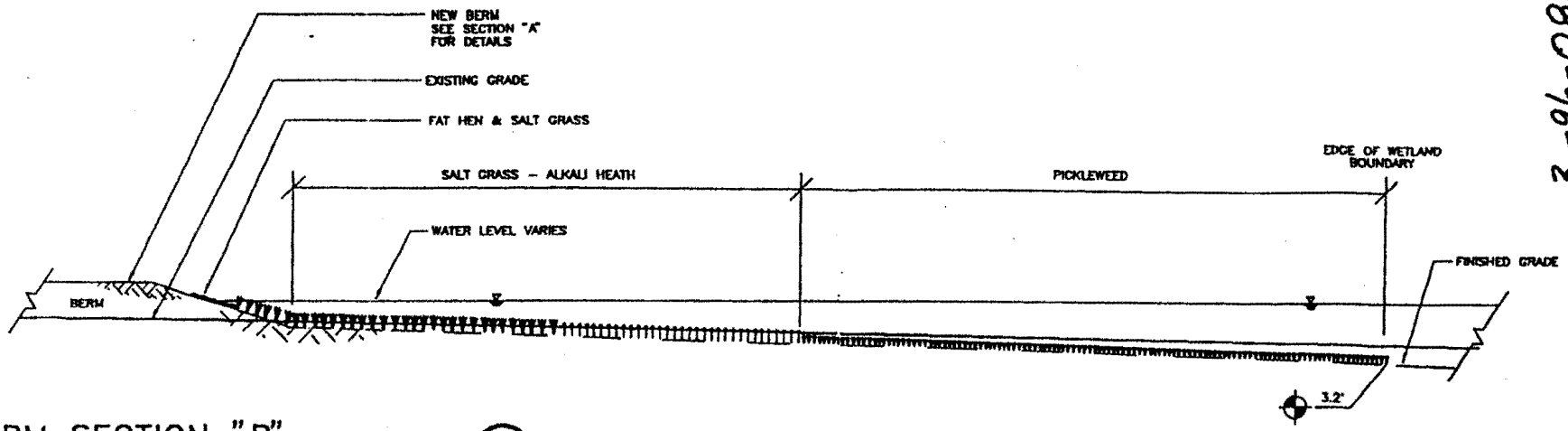
MOSS LANDING FLOOD CONTROL BERM

FIG. 2

DESIGNED BY:	KG/SH
DATE:	10/17/97
JOB #:	97126
SCALE:	1"=80'

JOHN GILCHRIST & ASSOCIATES
429-4366

3-96-088
CALIFORNIA COASTAL COMMISSION
EXHIBIT 6
6

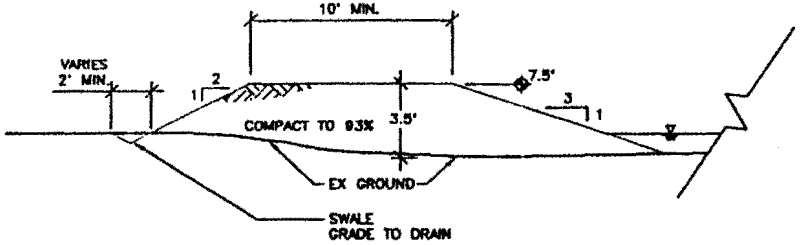


BERM SECTION "B"

SCALE: N.T.S.

B

02



BERM SECTION "A"

SCALE: N.T.S.

A

01

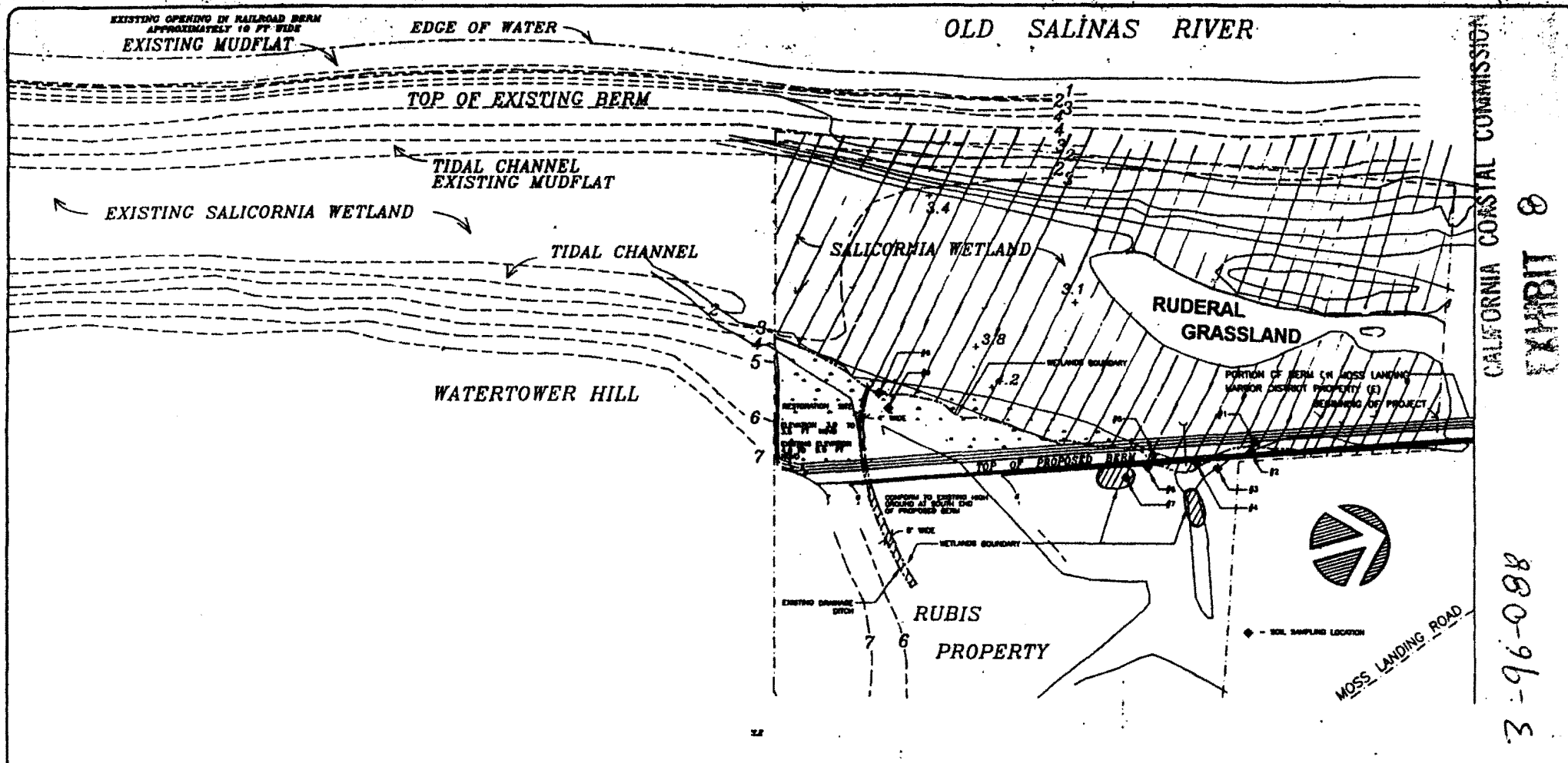
MOSS LANDING FLOOD CONTROL BERM	DESIGNED BY: KG/SH	MERRITT-MILLER ENGINEERING Civil and Structural Engineering 224 Walnut Ave. Santa Cruz, CA 95060 408 429 3188
	DATE: 10/20/97	
	JOB #: 97126	JOHN GILCHRIST & ASSOCIATES 429--4355
FIG. 4	SCALE: AS NOTED	

3-96-088

CALIFORNIA COASTAL COMMISSION

EXHIBIT 7

7



FINAL WETLAND DELINEATION

Preliminary Wetland Delineation conducted 2-26-96
Field Checked by USCOE staff on 6-27-97
Final Wetland Delineation issued on 7-28-97

PROPERTY LINE

RESTORATION SITE

MOSS LANDING FLOOD CONTROL BERM

John Gilchrist & Associates

226 Spring Street, Santa Cruz, CA 95060 (408) 429-4355 FAX 429-5788

October 16, 1997

Ms. Joy Chase
California Coastal Commission
725 Front Street
Santa Cruz, CA 95060

RE: Moss Landing Flood Control Berm project

Dear Joy:

You have requested that the Monterey County Water Resources Agency provide information on flood risk to the town of Moss Landing. It is our understanding that this documentation is necessary to construct a flood control structure in wetlands pursuant to CCC guidelines. Due to funding limitations for the flood control berm project, the MCWRA has not prepared a hydrologic analysis to precisely delineate a 100-year flood elevation for this project. However, various information sources do indicate that a flood hazard does exist from the Old Salinas River, and that protection is needed for the town.

A flood hazard occurs in this location when there is a combination of high runoff down the Old Salinas River channel (with the major component of flow coming from Tembladero Slough), and a high tidal event in Monterey Bay. Currently the town of Moss Landing is protected by a narrow railroad berm on the east river bank. Elevations of this berm are approximately +4 feet NGVD, or about 2 feet higher than the surrounding marsh plain. Elevations in the town of Moss Landing are also approximately 4 to 5 feet NGVD. A small culverted opening in this berm (approximately 800 feet south of the project site) allows high tidal flows to reach the salt marsh; however, the culvert is too small to allow sufficient inundation that would reach further inland to Moss Landing Road or the improvements in the town. The exception to this is during periods when high OSR flows coincide with extremely high tides, and the berm is overtopped in various places. This occurred during January 1983 when a *mean daily* flow of 450 cubic feet per second (cfs) down Tembladero Sl. occurred during a high tide of 6.5 feet, about 10:00 A.M. on January 29 (see Attachment A). No peak flow information is available for Tembladero or the Old Salinas River, but peak flows in the lower Salinas River occurred in the midday during the highest tidal period.

A review of the 1995 runoff in the Tembladero/Old Salinas River system shows a different scenario. On March 10th high mean daily flow was 377 cfs. A peak discharge of 659 cfs occurred at 1645 when the tide was about 2.3 feet moving toward a high tide of 3.4 at 19:11 (see Attachment B). Water overtopped the old railroad levee and flooded Moss Landing in 1983 (see Attachment C), but no flooding took place in Moss Landing in 1995.

A central issue for the MCWRA is the deteriorating condition and maintenance requirements for the Old Railroad berm. The berm is only 2 feet high, 2 to 3 feet wide, is poorly compacted and subject to direct wave and runoff erosion from the Old Salinas River. Due to its small size and the presence of the intervening saltmarsh, the Agency cannot provide normal maintenance of this structure. Agency staff has therefore chosen to abandon use of the railroad berm as a flood control structure, allow it the slowly deteriorate, and build the proposed berm.

When the Old Railroad berm deteriorates so that unrestricted tidal channels are opened from the OSR to the saltmarsh, nearby lowlying properties will be subject to flooding during high tide events. Absent any intervening flood control structure, properties at the 3.5 to 4' NGVD elevation would be inundated by 6.5' to 7.0' high tide events (corresponding to 3.6 to 4.1 NGVD datum) (See Attachment D). A large runoff volume down the Old Salinas River during flood periods can add 2 to 3 feet to the water surface elevation (see Attachment E), causing flooding up to the 6 to 7' NGVD elevation during extreme high tides. This analysis is somewhat oversimplified in that it doesn't consider factors such as flood water distribution over Moss Landing floodplain, the influence of Moro Cojo Slough, or the actual tidal prisim through harbor to the project site. A complete hydrologic modeling effort would be needed to fully document all variables. This simplified analysis does indicate that construction of a berm at the 7.5 NGVD elevation (allowing for about ½ foot subsidence) is necessary to provide protection against the combination of high runoff during a high tide.

I hope this provides the information you are seeking on this issue. Please don't hesitate to call if I can answer any questions or provide additional information.

Sincerely,

John Gilchrist

Attachments

Cc: Rich Boyer, MCWRA

3-96-088
CALIFORNIA COASTAL COMMISSION
EXHIBIT 9 2 of 2

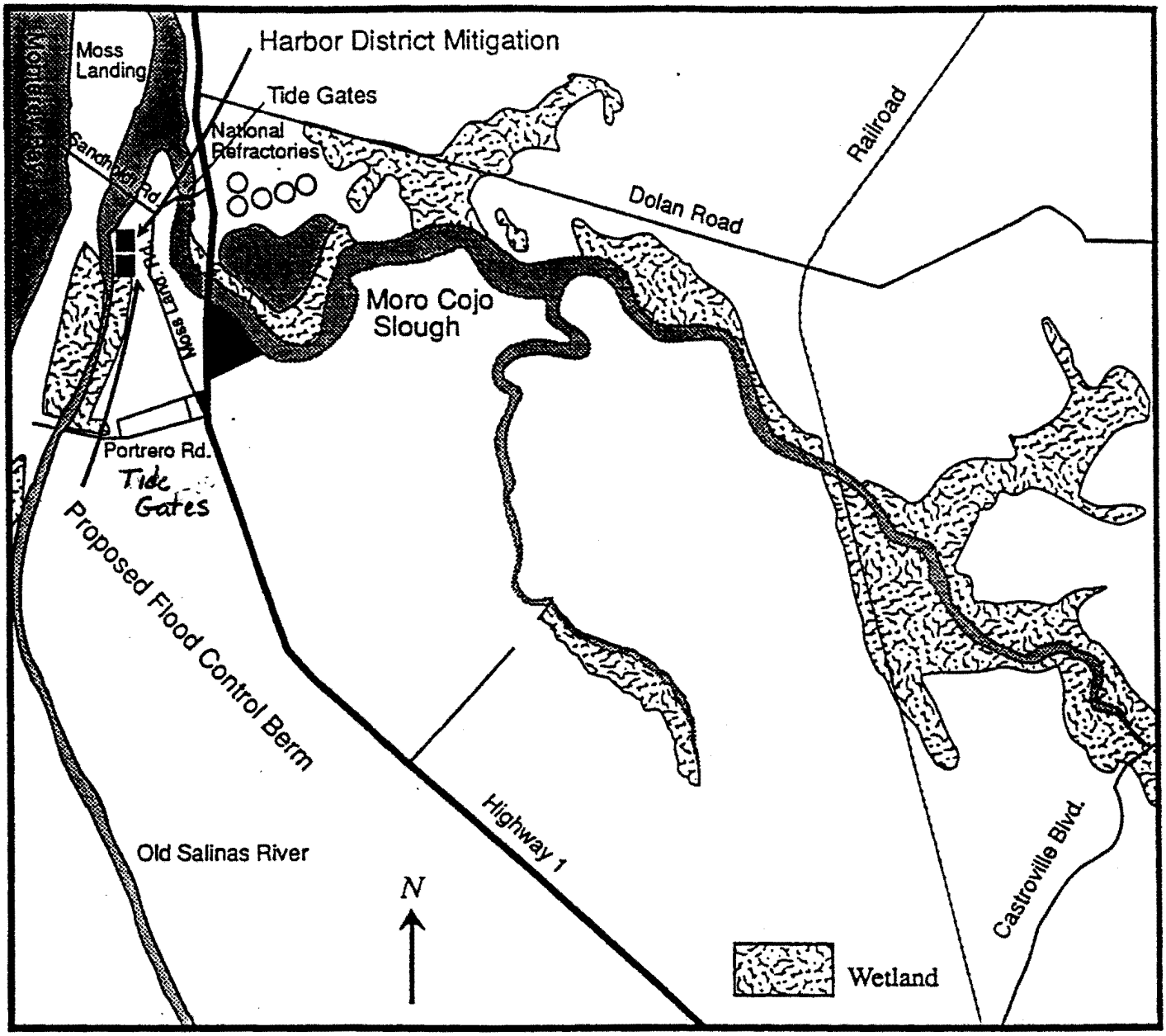


Figure 1. Vicinity of Moss Landing showing sites of Harbor District mitigation project, proposed Flood Control District berm.

3-96-088
CALIFORNIA COASTAL COMMISSION
EXHIBIT 10

VICINITY MAP
APPLICATION BY:MONTEREY COUNTY WATER RESOURCES AGENCY
PO BOX 930 SALINAS, CA 93940
PROPOSED MOSS LANDING FLOOD CONTROL BERM
IN:MOSS LANDING AT:EAST SIDE OF OLD SALINAS RIVER CHANNEL
COUNTY OF: MONTEREY STATE: CA
PURPOSE: PREVENT FLOODING IN SURROUNDING AREA
DATUM: NGVD LIST OF ADJACENT PROPERTY OWNERS ATTACHED