

MINUTE ITEM

This Calendar Item No. C11
was approved as Minute Item
No. 11 by the State Lands
Commission by a vote of 3
to 0 at its 08/30/89
meeting.

CALENDAR ITEM

A 29

C11

08/30/89

S 14

W 24115 PRC 7326

Fong

GENERAL LEASE - RIGHT-OF WAY-USE

APPLICANT: The Abalone Farm, Inc.
P.O. Box 136
Cayucos, California 93430

AREA, TYPE LAND AND LOCATION:
A 0.13 acre parcel of tide and submerged
land in the Pacific Ocean near Cayucos,
San Luis Obispo County.

LAND USE: One intake pipeline and two discharge
pipelines for a mariculture facility.

TERMS OF PROPOSED LEASE:
Initial period: 30 years beginning October 1,
1989.

Surety bond: \$2,000

Public liability insurance: Combined single
limit coverage of \$500,000.

Consideration: \$160 per annum; five-year
rent review.

BASIS FOR CONSIDERATION:
Pursuant to 2 Cal. Code Regs. 2003.

APPLICANT STATUS:
Applicant is lessee of upland.

CALENDAR ITEM NO. C.11 (CONT'D)

PREREQUISITE CONDITIONS, FEES AND EXPENSES:

Filing fee has been received

STATUTORY AND OTHER REFERENCES:

- A. P.R.C.: Div. 6, Parts 1 and 2; Div. 13.
- B. Cal. Code Regs.: Title 2, Div. 3;
Title 14, Div. 6.

AB 884: 10/21/89.

OTHER PERTINENT INFORMATION:

1. The Applicant has operated an abalone mariculture facility on the upland property near Cayucos in San Luis Obispo County since 1969. The intake and discharge pipelines are used to transport seawater to support the abalone culture.
2. A Negative Declaration was prepared and adopted for this project by the County of San Luis Obispo; however, their document was not circulated through the State Clearinghouse. Staff has reviewed such document and has circulated it through the State Clearinghouse, SCH No. 89071212. Staff believes that the document, having been circulated, complies with the requirements of CEQA.
3. Staff and The Abalone Farm, Inc. have agreed to a settlement in the amount of \$2,000 for back rental for the period of unauthorized use from 1969 to 1989. Staff recommends that penalty and interest be waived.

APPROVALS OBTAINED:

State of California Aquaculture License, State Water Quality Control Board, and County of San Luis Obispo Land Use Permit.

FURTHER APPROVALS REQUIRED:

United States Army Corps of Engineers and California Coastal Commission.

EXHIBIT:

- A. Land Description.
- B. Location Map.
- C. Negative Declaration.

CALENDAR ITEM NO. C 11 (CONT'D)

IT IS RECOMMENDED THAT THE COMMISSION:

1. CERTIFY THAT A NEGATIVE DECLARATION, EIR ND 488, STATE CLEARINGHOUSE NO. 89071212, WAS PREPARED FOR THIS PROJECT PURSUANT TO THE PROVISIONS OF THE CEQA AND THAT THE COMMISSION HAS REVIEWED AND CONSIDERED THE INFORMATION CONTAINED THEREIN.
2. DETERMINE THAT THE PROJECT, AS APPROVED, WILL NOT HAVE A SIGNIFICANT EFFECT ON THE ENVIRONMENT.
3. AUTHORIZE THE ACCEPTANCE OF PAYMENT IN THE AMOUNT OF \$2,000 AS BACK RENT FOR THE UNAUTHORIZED USE OF STATE LANDS; AND AUTHORIZE THE WAIVER OF PENALTY AND INTEREST FOR THE PERIOD OF UNAUTHORIZED USE.
4. AUTHORIZE ISSUANCE TO THE ABALONE FARM, INC. OF A 30-YEAR GENERAL LEASE - RIGHT-OF-WAY USE BEGINNING OCTOBER 1, 1989, IN CONSIDERATION OF ANNUAL RENT IN THE AMOUNT OF \$160 WITH THE STATE RESERVING THE RIGHT TO FIX A DIFFERENT RENTAL ON EACH FIFTH ANNIVERSARY OF THE LEASE; PROVISION OF A \$2,000 SURETY BOND; PROVISION OF PUBLIC LIABILITY INSURANCE FOR COMBINED SINGLE LIMIT COVERAGE OF \$500,000; FOR INTAKE AND DISCHARGE PIPELINES ON THE LAND DESCRIBED ON EXHIBIT "A" ATTACHED AND BY REFERENCE MADE A PART HEREOF.

(REVISED 08/29/89)

-3-

CALENDAR PAGE	57
MINUTE PAGE	2648

EXHIBIT "A"

LAND DESCRIPTION

W 24115

Three parcels of tide and submerged land in the Pacific Ocean, San Luis Obispo County, California, said parcels lying immediately beneath the existing sea water intake pipelines and beneath two existing discharge pipes easterly or downcoast from the intake parcel. Said parcels adjacent to and seaward of Assessors Parcels 45-151-07 and 45-151-09 as conveyed to John A. Alexander, recorded February 29, 1968 in Book 1467 Page 33, San Luis Obispo Official Records, **TOGETHER WITH** a use area extending 10 feet from the extremities of said pipes.

EXCEPTING THEREFROM any portion lying landward of the ordinary high water mark of the Pacific Ocean.

END OF DESCRIPTION

PREPARED JULY 26, 1988 BY BIU 1.

CALENDAR PAGE	58
MINUTE PAGE	2649

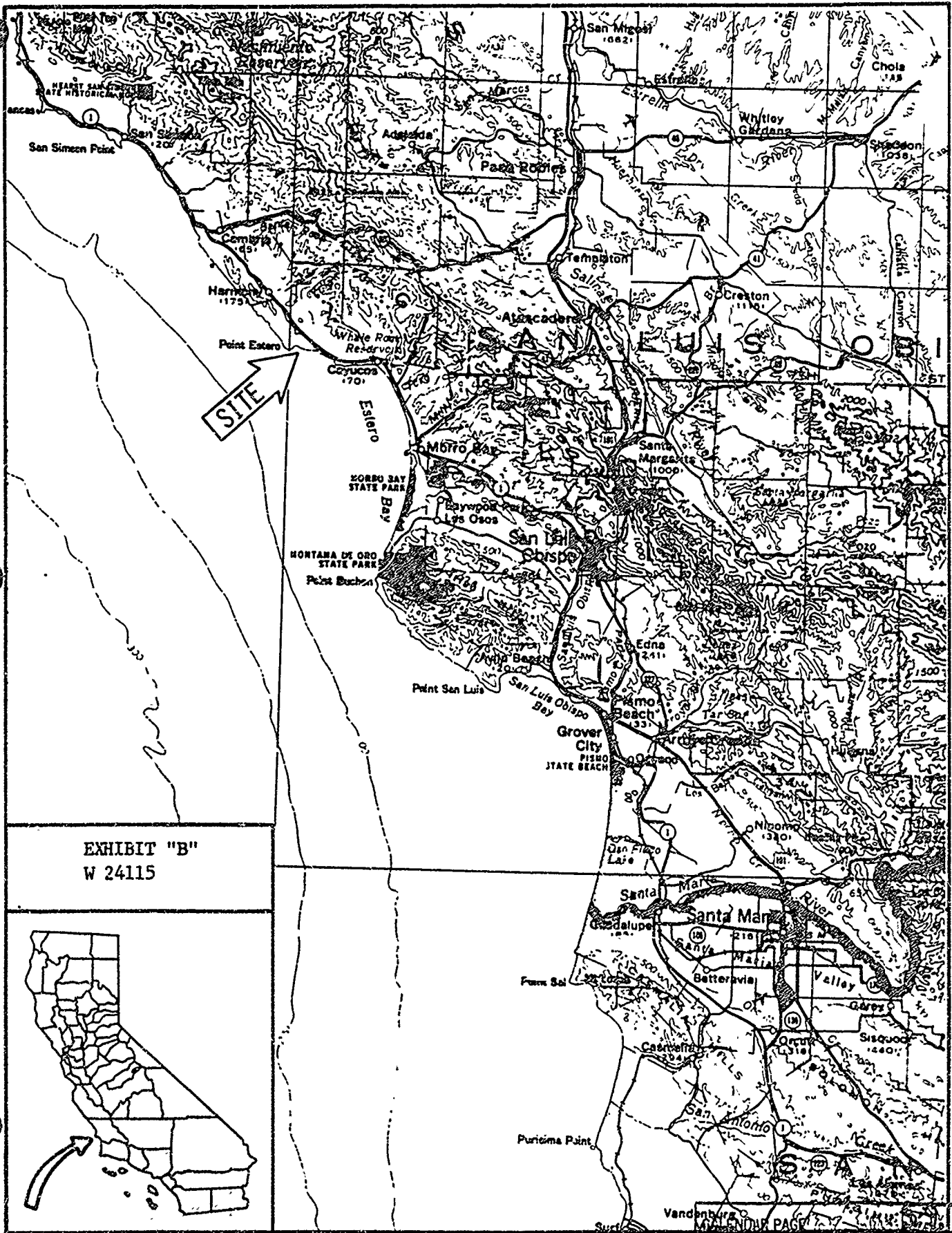


EXHIBIT "B"
W 24115



MINUTE PAGE

2550

STATE LANDS COMMISSION
1807 13TH STREET
SACRAMENTO, CALIFORNIA 95814PROPOSED NEGATIVE DECLARATION

EIR ND 488

File Ref.: W 24115

SCH#: 89071212

Project Title: The Abalone Farm Development Plan

Project Proponent: The Abalone Farm, Inc.

Project Location: On the coastal bluff 1/2 mile southwest of Highway 1, 6 miles west of Cayucos.

Project Description: The applicant proposes to expand existing Abalone farm facilities to include construction of additional raceway tanks..

Contact Person: Judy Brown Telephone: (916) 324-4715

This document is prepared pursuant to the requirements of the California Environmental Quality Act (Section 21000 et seq., Public Resources Code), the State CEQA Guidelines (Section 15000 et seq., Title 14, California Code Regulations), and the State Lands Commission regulations (Section 2901 et seq., Title 2, California Code Regulations).

Based upon the attached Initial Study, it has been found that:

the project will not have a significant effect on the environment.

mitigation measures included in the project will avoid potentially significant effects.

CALENDAR PAGE	60
MINUTE PAGE	2651

Form 13.17 (2/89)

1. Project Title: The Abalone Farm Development Plan
2. Lead Agency: State Lands Commission 3. Contact Person: WILLI EISWIT
3a. Street Address: 1807 12th Street 3b. City: ORLANDO
3c. County: Sacramento 3d. Zip: 95814 3e. Phone: (416) 224-4715

PROJECT LOCATION 4. County: Santa Clara 4a. City/Community: San Jose
4b. Assessor's Parcel No. 046-151-005 4c. Section NE 1/4 4d. Twp. 23 South Range 7 East

5a. Cross Streets: San Jose and New 5b. For Rural, Nearest Community: San Jose

6. Vicinity 2 miles: a. State Hwy # 1 b. Airports 0 c. Railways 0 d. Waterways Public

7. DOCUMENT TYPE
- 01. CEQA
 - 01. REP 06. HAZ
 - 02. Early Conc 07. HOC
 - 03. Req Doc 08. ROD
 - 04. Draft EIR
 - 05. Supplement/ Subsequent EIR (Prior SCH No.:
 - 09. FEIS 11. Draft EIS
 - 10. FOISI 12. EA
 - 13. Joint Document
 - 14. Final Document
 - 15. Other
8. LOCAL ACTION TYPE
- 01. General Plan Update
 - 02. Rez Element
 - 03. General Plan Amendment
 - 04. Master Plan
 - 05. Initiation
 - 06. Specific Plan
 - 07. Community Plan
 - 08. Redevelopment
 - 09. Rezone
 - 10. Lead Division (Subdivision, Parcel Map, Tract Map, etc.)
 - 11. Use Permit
 - 12. Waste Mgmt Plan
 - 13. Channel Ag Preserve
 - 14. Other
9. DEVELOPMENT TYPE
- 01. Residential - Units Acres
 - 02. Office: Sq. Ft. Acres Employees
 - 03. Shopping/Commercial: Sq. Ft. Acres Employees
 - 04. Industrial: Sq. Ft. Acres Employees
 - 05. Water Facilities: MGD
 - 06. Transportation: Type
 - 07. Mining: Mineral
 - 08. Power: Type Watts
 - 09. Waste Treatment: Type
 - 10. CCS Related
 - 11. Other: MARICULTURE

10. SPECIAL CONCERN:
- 01. X Aesthetic/Visual
 - 02. X Agricultural Lands
 - 03. X Air Quality
 - 04. X Archaeological/Historical
 - 05. X Coastal Zone
 - 06. Seismic
 - 07. X Flood Hazard
 - 08. X Flooding/Drainage
 - 09. X Geologic/Seismic
 - 10. Wetlands/Estuarine
 - 11. Minerals
 - 12. Noise
 - 13. Public Services
 - 14. Schools
 - 15. Seismic Systems
 - 16. Sewer Capacity
 - 17. Social
 - 18. Soil Erosion
 - 19. Solid Waste
 - 20. Toxic/Hazardous
 - 21. Traffic/Circulation
 - 22. Vegetation
 - 23. Water Quality
 - 24. Water Supply
 - 25. Wetlands/Alpharion
 - 26. Wildlife
 - 27. Growth Inducing
 - 28. Incompatible Landuse
 - 29. Cumulative Effects
 - 30. Other
13. FEDERAL (approx) Federal \$ _____ State \$ _____ Total \$ _____
14. FINANCY LEAD GEN AND ISSUES:

15. PROJECT DESCRIPTION: The applicant proposes to expand existing Abalone farm facilities to include construction of additional raceway tanks.

CLEARINGHOUSE CONTACT: GARRETT ASHLEY W/C N/C
916-463-0813
STATE REVIEW BEGAN: 7-12-89
DEPT REV TO AGENCY: 8-4
AGENCY REV TO SCH: 8-9
SCH COMPLIANCE: 8-11
PLEASE RETURN MOC WITH ALL COMMENTS
Resources
AQHD/APCD: 29 (File Date: 7/15)
FAX TELEPHONE: 916-323-3018

- Resources
- Conservation
- Fish & Game
- Parks & Rec/SWP
- Coastal Comm
- ARIS

PLANNING COMMISSION
COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA

February 23, 1989

PRESENT: Commissioners Gary Larson, Tom Maxwell, David Oakley, Kenneth Schwartz, Henry Wachtmann, Chairman Fabian Romano

ABSENT: None

RESOLUTION NO. 89-17
RESOLUTION RELATIVE TO THE GRANTING
OF A DEVELOPMENT PLAN

WHEREAS, The County Planning Commission of the County of San Luis Obispo, State of California, did, on the 23th day of February, 1989, grant a Development Plan (hereafter "Permit") to FRANK OAKS/TOM BAUMBERGER to allow an aquaculture facility involving the expansion of an existing abalone farm including abalone tanks, production buildings, nursery buildings, sea water control system, storage area and office and caretakers residences in the Agriculture Land Use Category. The property is located in the Agriculture Land Use Category. The property is located in the coastal zone of the county west of Highway 1 at the ocean bluff in the Estero Planning Area. County File Number: D870182D.

WHEREAS, The Planning Commission, after considering the facts relating to said application, , approves this Permit subject to the Findings listed in Exhibit A.

WHEREAS, The Planning Commission, after considering the facts relating to said application, approves this permit subject to the Conditions listed in Exhibit B.

EX-111-11-11-11-11

NOW, THEREFORE, BE IT RESOLVED, That the Planning Commission of the County of San Luis Obispo, State of California, in a regular meeting assembled on the 23th day of February, 1989, does hereby grant the aforesaid Permit, No. D870182D.

If the use authorized by this Permit approval has not been established or if substantial work on the property towards the establishment of the use is not in progress after a period of twenty-four (24) months from the date of this approval or such other time period as may be designated through conditions of approval of this Permit, this approval shall expire and become void unless an extension of time has been granted pursuant to the provisions of Section 22.02.050 of the Land Use Ordinance.

If the use authorized by this Permit approval, once established, is or has been unused, abandoned, discontinued, or has ceased for a period of six months (6) or conditions have not been complied with, such Permit approval shall become void.

On motion of Commissioner Maxwell, seconded by Commissioner Oakley, and on the following roll call vote, to-wit:

AYES: Commissioners Maxwell, Oakley, Larson, Schwartz, Wachtmann, Chairman Romano

NOES: None

ABSENT: None

the foregoing resolution is hereby adopted.

/s/ Fabian Romano
Chairman of the Planning Commission

ATTEST:
/s/ Diane R. Tingle
Secretary, Planning Commission

1450L

CALENDAR PAGE	63
MINUTE PAGE	2654

EXHIBIT A

FINDINGS

- A. The proposed project is consistent with the Land Use Element of the general plan because aquaculture is considered to be allowable as an S-3 use under Coastal Table "O"; and the project does not conflict with any other elements of the general plan.
- B. With the conditions of approval, the proposed project satisfies all applicable provisions of Title 23 of the San Luis Obispo County Code.
- C. The establishment and subsequent operation of conduct of the use will not, because of the circumstances and conditions applied in the particular case, be detrimental to the health, safety or welfare of the general public or persons residing or working in the neighborhood of the use, or be detrimental or injurious to property or improvements to the vicinity of the use because the conditions of approval will mitigate environmental concerns. The main building area cannot be readily viewed from Highway 1 or from surrounding properties due to the intervening ridgeline, except for one significant viewshed which will be screened from view by substantial landscaping and lighting screens.
- D. The proposed project or use will not be inconsistent with the character of the immediate neighborhood or contrary to its orderly development because the project will be locating within an agricultural area.
- E. The proposed use or project will not generate a volume of traffic beyond the safe capacity of all roads providing access to the project, either existing or to be improved with the project because the project will generate a very low volume of traffic.
- F. On the basis of the expanded initial study and all comments received, there is no substantial evidence that the project will have a significant effect on the environment.
- G. The project is consistent with the policies of the Local Coastal Plan.

1478j

EXHIBIT B

EXHIBIT D870182D:A
CONDITIONS OF APPROVAL

AUTHORIZED USE

1. This approval authorizes establishment of an aquaculture facility to include six primary buildings, one primary residence, one agricultural support quarters, parking areas, raceways, storage buildings, screened storage areas, seawater distribution systems; and an expansion area for additional raceways and a seawater distribution system. This facility includes two hatchery buildings not to exceed 35 feet in height; and intake and discharge pipelines for saltwater circulation. The use shall be reviewed by Planning Department 10 years from the date of approval for compliance with conditions of approval and report to Planning Commission.
2. Prior to issuance of any building or grading permits all of the existing buildings that have not received required building permits shall be brought into conformance with the Uniform Building Code through the issuance of the appropriate permits. Approval of the Development Plan for this project does not constitute individual building conformance with the Uniform Building Code.

REVISED SITE PLAN

3. Site development shall be consistent with a revised site plan to be submitted to the development Review Section of the Department of Planning and Building for review and approval before issuance of building/grading permits. The revised plan shall indicate the following:
 - parking areas to provide a total of 40 parking spaces
 - solid wood fencing between the main entrance road and the northeastern end of the Alexander Research Facility.
 - solid wood or other effective fencing for screening of two storage yards.
 - an additional storage building located to the west of the hatchery buildings.
 - all other buildings not currently shown on the site plan.

STORAGE

4. All stockpiles of unused metal objects and machinery shall be properly disposed of off-site prior to finalizing building permits on an ongoing basis.
5. All storage structures, mobile offices, recreational vehicles not associate with the caretakers personal use shall be removed from the site prior to finalizing building permits.

LANDSCAPING

6. Submit landscape, irrigation, landscape maintenance plans and specifications as required by Sections 23.04.180 through 23.04.186 of the Coastal Zone Land Use Ordinance to the Development Review Section of the Department of Planning and Building for review and approval before issuance of a building or grading permit. The plans shall include the following:
- a. Rows or Groupings of trees of a fast growing, drought tolerant variety located at the eastern perimeter of the parcel (or leasehold) to effectively screen the facility (especially the taller buildings) from the view shed occurring on Highway 1 headed north.
 - b. Rows of Cyprus or other appropriate species indigenous to the area around all building groups.
 - c. Grasses and other ground cover to stabilize denuded areas and prevent further erosion.
 - d. Screening of caretakers residences located on the hillsides.

Where possible the plans shall show species which are non-invasive to existing plant species, although some use of non-native species may be necessary to bring about timely screening of buildings.

7. Landscaping in accordance with the approved landscaping plan shall be installed or bonded for prior to final building/grading inspection. If bonded for, landscaping shall be installed within 60 days after final building inspection and thereafter maintained in a viable condition on a continuing basis.

REVEGETATION

8. The applicant shall submit a revegetation plan to address construction impacts for review and approval by the Planning Department and the Environmental Coordinator's Office prior to issuance of grading/building permits. The plan shall include the following:
- a. Revegetation and stabilization of disturbed areas including:
 - The access road into the site;
 - All cut and fill slopes associated with the construction of the existing facility and the proposed expansion.
 - Bluff areas disturbed by the seawater intake and outfall pipelines, and drainage facilities as deemed appropriate by the Environmental Coordinator.
 - b. Propagation program for indigenous plant species where deemed appropriate.

DRAINAGE AND EROSION CONTROL

9. Submit grading, sedimentation and erosion control, and drainage plans prepared in accordance with the requirements of Section 23.05.024, 23.05.028, 23.05.036 and 23.05.044 of the Coastal Zone Land Use Ordinance to the Planning Department for review and approval before issuance of grading and building permits. If so required, review of the plan shall be subject to an inspection and checking agreement with the Engineering Department and/or the plan shall be prepared by a registered civil engineer.
10. The grading and/or drainage plans shall demonstrate to the County Engineering Department that the following factors have been evaluated and incorporated into the final design:
 - a. Slope stability and soil erodability.
 - b. Bearing capacity.
 - c. Seismic loads.
 - e. Wind and run-off erosion.
11. Applicant shall enter into a performance agreement in a form acceptable to County Counsel and submit a bond to ensure compliance with restoration/reclamation plan.
12. Excavation for burial of the pipelines throughout the site shall minimize site disturbance, especially near the bluff.
13. No borrow areas for "extra fill" shall be permitted without review and approval by the Planning Department of precise plans depicting the exact location and extent of excavation.

INTAKE/DISCHARGE FACILITIES

14. Energy-efficient electric pumps shall be used for the intake system.

UTILITIES

15. All new utility lines shall be underground, except where infeasible or where existing poles and lines provide access to the site.

FIRE PROTECTION

16. The applicant shall obtain a fire safety plan approved by the California Department of Forestry prior to issuance of building/grading permits.

17. The applicant shall install any required fire improvements prior to finalizing the building permits as specified in the fire safety plan approved by CDP.

SEWAGE DISPOSAL

18. The applicant shall submit evidence from the Environmental Health Department that they have reviewed all septic systems on the site, or submit plans for the septic systems designed by a registered engineer for review and approval prior to issuance of permits. Such plans shall certify that proper separation be maintained between groundwater and leach lines at all times. Low water-using fixtures shall be used for bathrooms.

OPERATION

19. The applicant shall provide bus or van pooling to the site for any large tours of the facility exceeding ten persons.
20. Opaque screens shall be used at night on the eastern side of the hatchery buildings to reduce visual impacts.
21. All exterior lights shall be hooded.

ENVIRONMENTAL

General Mitigation Measures

22. Concentrated runoff from the site shall not be allowed to flow over the coastal bluff, and shall be intercepted before reaching the bluff and diverted to control devices.
23. All areas of recent fill along the edge of the bluff will be planted to fast-growing grasses at the onset of the wet season to minimize first-year erosion, with native, salt-tolerant vegetation being introduced as rapidly as feasible for long-term stability.
24. Facilities to discharge collected runoff and seawater from the tanks on the site will be constructed so that the released water does not impact on the terrace deposits, but is released onto bedrock or the gravel beach. For most locations at the site, piping will extend down the bluff to an elevation of approximately 20 feet above mean sea level.
25. Discharge facilities will be constructed so that they can be periodically modified to accommodate changing bluff configurations. The large diameter PVC pipe now in use would appear to be ideal for this purpose.

Mitigation Measures for the Existing Abalone Farm Facilities

26. Drainage control will be improved at Points A and B (Figure 5 of the expanded Initial Study), north of the Alexander Marina Research Laboratory, so that concentrated runoff is conveyed westerly along the access road to the primary collection Point C rather than crossing the road and flowing to the bluff along uncontrolled channels.
27. An open concrete "V" ditch, similar to that along the southerly edge of the east raceway tanks, will be installed southerly from the west raceway tanks. This ditch could be located in the center or along the southerly edge of this access road. The ditch will be designed to carry the total seawater flow to these tanks in the event of a spill, or runoff from the local area for a 100-year storm, whichever is greater. The area between this access road and the bluff (now loose fill) will be graded to direct surface flow back to the "V" ditch to the extent that this is feasible.
28. Drainage facilities along the road to the intake pumphouse will be revised as follows:
 1. The intake to the pipe at the bottom of the road will be improved to include a concrete box configured to minimize sediment clogging (i.e., edges raised above road level but below the level of the berm at the south edge of the road).
 2. Concentrated runoff from above the steep segment of this road (easterly of Point D on Figure 5 of the expanded Initial Study) will be intercepted and conveyed to the box inlet at the bottom of the road by a pipe buried in the roadway. (This improvement is intended to minimize runoff flowing down the steep segment of the road and consequent erosion and sedimentation at the box inlet.)
 3. Runoff from the steep segment of the road will be channeled in a drainage pipe of non-erosive device located in the center of the road or on the inland side of the road, and conveyed to the box inlet at the bottom end of the road.
 4. Discharge from the pipe from the box inlet shall be onto bedrock and not onto the softer terrace deposits (i.e., at or below an elevation of approximately 20 feet).

Specific Mitigation Measures for the Abalone Farm Expansion Facilities

29. Control of excess surface runoff or a spill of seawater from the expansion facilities will be controlled by providing an open concrete ditch along the southerly perimeter of the facility.

Specific Mitigation Measures for the Alexander Marine Research Laboratory

30. Prior to issuance of building/grading permits, a qualified geologist approved by the Environmental Coordinator will visit the site and determine if the seepage from the concrete pond is still significant or whether the leak has been adequately mitigated. In the event the geologist determines the seepage is still significant, the supply of water to the pond by the applicant will be terminated until corrected.
31. The drainage course along the southeasterly side of the concrete pond will be improved to conform to the general recommendations listed above.

ARCHAEOLOGY

32. The proposed construction area shall be flagged in the field within 100 feet of the Sensitive Archaeological Area identified in the Archaeological Report. In the event that additional archaeological resources are discovered, construction activities shall cease until further authorized by the Planning Department to allow for evaluation and retrieval.

COASTAL COMMISSION

33. The applicant shall obtain a Coastal Development Permit for the portion of the site that is within Coastal Commission jurisdiction before finaling permits.

TW/hf/1478j
2/17/89

(200) FOR OFFICIAL USE ONLY
COUNTY OF SAN LUIS OBISPO
NOTICE OF DETERMINATION AND
NEGATIVE DECLARATION

ENVIRONMENTAL DETERMINATION NO. ED88-200, 120 DATE DECEMBER 16, 1988

PROJECT DESCRIPTION

APPLICATION/ENTITLEMENT: The Abalone Farm Development Plan and Grading Permit; D870182D, GP#60447

PLANNING AREA: Estero, rural

LAND USE CATEGORY: Agriculture

LUE COMBINING DESIGNATIONS: Local Coastal Plan (LCP), Sensitive Resource Area (SRA)

PARCEL SIZE: Total acreage of owner's property at this location 350 acres. Total acreage of project - 18.5 acres

LOCATION: The subject property is located on the coastline, directly west of the intersection at Villa Creek road and Highway 1, north of the community of Cayucos

PROPOSED USES/INTENT: A request to construct and operate an abalone-raising facility that has already been constructed. The project consists of several linked components: a seawater intake and discharge system with pipelines, two hatchery buildings (totaling 3,100 square feet), two nursery buildings (totaling 9,600 square feet), a production and office building, and a caretaker's residence. An expansion of the existing facility is also a part of this request and includes installation of a new seawater and air control system, an air blower containment building and additional abalone growing tanks.

APPLICANT: Frank Oakes; Cayucos, CA

APPLICANT: Frank Oakes; Cayucos, CA

APPLICANT: Frank Oakes; Cayucos, CA

APPLICANT: Frank Oakes; Cayucos, CA

ENVIRONMENTAL SETTING

Topography: Nearly level to moderately sloping
Vegetation: Grasses, forbs
Soil Type: Cropley clay, Gazos-Lodo clay loams, Lodo clay loam, Salinas loam, still gravelly sandy loam
Soil Characteristics: Low to moderate erodibility; very poor to not well drained; may cause some limitations to the percolation of sewage effluent
Geologic Hazards: Very low to essentially nonexistent liquefaction potential; moderately high landslide potential
Fire Hazard: Moderate
Water: On-site well
Sewage Disposal: On-site septic systems
Existing Use: Abalone culture facility
Surrounding Uses: Agriculture (grazing)

ADDITIONAL INFORMATION

Additional information pertaining to this environmental determination may be obtained by contacting the Environmental Coordinator's Office, County Government Center Rm. 370, San Luis Obispo, CA 93408, (805) 549-5011.

STATEMENT OF FINDINGS

The Environmental Coordinator, after completion of the initial study, finds that there is no substantial evidence that the project may have a significant effect on the environment, and the preparation of an Environmental Impact Report is not necessary. Therefore, a Negative Declaration (pursuant to Public Resources Code Sections 21108, 21151 & 21167) is proposed.

ACTION TAKEN

On _____ 19___, the San Luis Obispo County Board of Supervisors/Planning Commission/Staff, having considered the Environmental Coordinator's action, approved/denied this project.

A copy of the Negative Declaration is available for review from the San Luis Obispo County Clerk, Room 385, County Government Center, San Luis Obispo, CA 93408.

SAN LUIS OBISPO COUNTY

INITIAL STUDY SUMMARY - ENVIRONMENTAL CHECKLIST

Project Environmental Analysis

The County's environmental review process incorporates all of the requirements for completing the Initial Study as required by the California Environmental Quality Act (CEQA) and the CEQA Guidelines. The Initial Study includes staff's on-site inspection of the project site and surroundings and a detailed review of the information in the file for the project. In addition, available background information is reviewed for each project. Relevant information regarding soil types and characteristics, geologic information, significant vegetation and/or wildlife resources, water availability, wastewater disposal services, existing land uses and surrounding land use categories and other information relevant to the environmental review process are evaluated for each project. The Office of Environmental Coordinator uses the checklist to summarize the results of the research accomplished during the initial environmental review of the project. Persons, agencies or organizations interested in obtaining more information regarding the environmental review process for a project should contact the San Luis Obispo County Office of Environmental Coordinator in Rm. 370, County Government Center, San Luis Obispo, CA or call (805) 549-5011.

Initial Study Reference and Agency Contacts: The following reference materials are used in the environmental review for each project and are hereby incorporated by reference into the Initial Study.

- * Project File for the Subject Application
- * County General Plan (Including all maps & elements)
- * County Land Use Ordinance
- * Area of Critical Concerns Map
- * Fire Hazard Severity Map
- * Rare and Endangered Species Map
- * Areas of Special Biological Importance Map
- * County Seismic Safety Element
- * Archaeological Resources Map
- * U.S. Soil Conservation Service Soil Survey for San Luis Obispo County
- * Flood Hazard Maps
- * Other special studies, reports and previously prepared EIRs as appropriate.
- * Airport Land Use Plans

In addition to the above, the County Planning Department and/or the Office of Environmental Coordinator contacted responsible and trustee agencies for their comments on the proposed project. With respect to the subject application, the following agencies have been contacted.

- | | |
|--|--|
| <input checked="" type="checkbox"/> County Engineering Department | <input checked="" type="checkbox"/> State Coastal Commission |
| <input checked="" type="checkbox"/> County Planning Department | <input type="checkbox"/> CA Dept. of Forestry |
| <input checked="" type="checkbox"/> County Dept. of Environmental Health | <input type="checkbox"/> County Airport Manager |
| <input checked="" type="checkbox"/> Agricultural Commissioner's Office | <input type="checkbox"/> Airport Land Use Commission |
| <input checked="" type="checkbox"/> Air Pollution Control District | |
| <input checked="" type="checkbox"/> Regional Water Quality Control Board | |
| <input checked="" type="checkbox"/> California Dept. of Transportation | |
| <input checked="" type="checkbox"/> State Department of Fish and Game | |
| <input type="checkbox"/> Other _____ | |

Checklist Identification of Mitigations for Potential Impacts:

The checklist provides the identification and summary of the project's potential environmental impacts. Where potential impacts require mitigation, the following list of mitigations explains how the identified potential environmental impacts can and will be avoided or substantially lessened.

- A. The project has been changed to avoid or substantially lessen environmental impacts. Where changes require explanation, the change(s) will be discussed in the Special Environmental Considerations section or attached material following the checklist.
- B. The project is subject to standards and requirements of the Land Use Element/Land Use Ordinance and/or other County ordinances that include provisions to avoid or substantially lessen environmental impacts. These provisions are requirements that must be incorporated into the project.
- C. The project is subject to state and/or federal regulations, laws and/or requirements that include provisions to avoid or substantially lessen environmental impacts. The project must incorporate the above provisions in order to be in compliance with Federal and/or State law.
- D. A special mitigation plan to avoid or lessen environmental impacts has been agreed to by the applicant. This will be noted on the checklist and, if necessary, discussed in an attachment to the checklist.

SAN LUIS OBISPO COUNTY
INITIAL STUDY CHECKLIST

Project Title & No. The Abalone Farm Development Plan and Grading Permit; ED98-200, 120, (DA70182D, GP#60447)

	Potential Significant Impact	Impact Can and Will be Mitigated	Insignificant Impact	Not Applicable
I. <u>BIOLOGICAL RESOURCES</u>				
A. Wildlife	()	()	()	()
B. Vegetation	()	()	()	()
C. Habitat Area	()	()	()	()
D. Rare and/or Endangered Species	()	()	()	()
E. Unique or Fragile Biotic Community	()	()	()	()
F. Area of Critical Concern	()	()	()	()
G. State Area of Special Biological Importance	()	()	()	()
H. Riparian/Wetland Area	()	()	()	()
I. Other: _____	()	()	()	()

Mitigation: A _____ B _____ C _____ D _____
 See attached exhibit ()
 See Special Environmental Considerations ()
 See Document in file _____ ()

II. DRAINAGE, EROSION AND SEDIMENTATION

- A. Increased Storm Water Runoff
- B. Erodible Soils/Erosion
- C. Poorly Drained Soils
- D. Sedimentation
- E. Contributes to Existing Drainage Problem
- F. Alters Existing Drainage Course or Waterway
- G. Other: _____

Potential Significant Impact	Impact Can and Will be Mitigated	Insignificant Impact	Not Applicable
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()

Mitigation: A B C D
 See attached exhibit(s) _____
 See Special Environmental Considerations _____
 See Document in file _____

()
()
()

III. GEOLOGICAL HAZARDS/SITE ALTERATION

- A. Landslide Hazard
- B. Seismic Hazard
- C. Topographic Alteration; Grading for Buildings _____, Driveways _____, Roads _____, Other _____
- D. Soil Expansion
- E. Steep Slopes
- F. Other: Bluff Retreat

()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()

Mitigation: A B C D
 See attached exhibit(s) _____
 See Special Environmental Considerations _____
 See Document in file _____

()
()
()

IV. WATER RESOURCES

- A. Groundwater Quantity
- B. Groundwater Quality
- C. Surface Water Quantity
- D. Surface Water Quality
- E. Stream Flow Change
- F. Change to Estuarine Environment
- G. Other: _____

()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()
()	()	()	()

Mitigation: A B C D
 See attached exhibit(s) _____
 See Special Environmental Considerations _____
 See Document in file _____

()
()
()

Potential Significant Impact
 Impact Can and Will be Mitig.
 Insignificant Impact
 Not Applicable

V. POLLUTION

- A. Hazardous Materials () () () ()
- B. Groundwater Pollution () () () ()
- C. Surface Water Pollution () () () ()
- D. Increase in Existing Noise Levels () () () ()
- E. Exposure of People to Severe Noise Levels () () () ()
- F. Substantial Air Emissions () () () ()
- G. Deterioration of Ambient Air Quality () () () ()
- H. Creation of Objectionable Odors () () () ()
- I. Other: _____ () () () ()

Mitigation: A _____ B _____ C _____ D _____
 See attached exhibit(s) _____ ()
 See Special Environmental Considerations ()
 See Document in file _____ ()

VI. TRAFFIC

- A. Increase in Vehicle Trips () () () ()
- B. Reduced Levels of Service on Existing Public Roadways () () () ()
- C. Limited or Unsafe Access () () () ()
- D. Creates Unsafe Conditions on Public Roadways () () () ()
- E. Areawide Traffic Circulation () () () ()
- F. Internal Traffic Circulation () () () ()
- G. Other: _____ () () () ()

Mitigation: A _____ B _____ C _____ D _____
 See attached exhibit(s) _____ ()
 See Special Environmental Considerations ()
 See Document in file _____ ()

VII. PUBLIC SERVICES

- A. Fire Protection Services () () () ()
- B. Police Services () () () ()
- C. Schools () () () ()
- D. Community Wastewater () () () ()
- E. Community Water Supply () () () ()
- F. Solid Waste Disposal () () () ()
- G. Onsite Wastewater () () () ()
- H. Onsite Water () () () ()
- I. Other: _____ () () () ()

Mitigation: A _____ B _____ C _____ D _____
 See attached exhibit(s) _____ ()
 See Special Environmental Considerations ()
 See Document in file _____ ()

VIII. AESTHETIC/CULTURAL RESOURCES

- | | Potential Significant Impact | Impact Can and Will be Mitigated | Insignificant Impact | Not Applicable |
|--------------------------------------|------------------------------|----------------------------------|----------------------|----------------|
| A. Visual Impact from Public Roadway | () | () | () | () |
| B. Increased Light or Glare | () | () | () | () |
| C. Alters Important Scenic Vista | () | () | () | () |
| D. Archaeological Resources | () | () | () | () |
| E. Historic Resources | () | () | () | () |
| F. Other: _____ | () | () | () | () |

Mitigation: A _____ B _____ C _____ D _____
 See attached exhibit(s) _____ ()
 See Special Environmental Considerations ()
 See Document in file _____ ()

IX. HOUSING AND ENERGY

- | | | | | |
|---|-----|-----|-----|-----|
| A. Creates Substantial Demand for Housing | () | () | () | () |
| B. Uses Substantial Amount of Fuel or Energy | () | () | () | () |
| C. Encourages Growth Beyond Resource Capacities | () | () | () | () |
| D. Other: _____ | () | () | () | () |

Mitigation: A _____ B _____ C _____ D _____
 See attached exhibit(s) _____ ()
 See Special Environmental Considerations ()
 See Document in file _____ ()

X. AGRICULTURAL/MINERAL RESOURCES

- | | | | | |
|--|-----|-----|-----|-----|
| A. Eliminates Valuable Mineral Resources | () | () | () | () |
| B. Prime Agricultural Soils | () | () | () | () |
| C. Conflicts with Existing Agricultural Area | () | () | () | () |
| D. Change from Agriculture to Other Uses | () | () | () | () |
| E. Other: _____ | () | () | () | () |

Mitigation: A _____ B _____ C _____ D _____
 See attached exhibit(s) _____ ()
 See Special Environmental Considerations ()
 See Document in file _____ ()

XI. GROWTH INDUCING/CUMULATIVE EFFECTS

	Potential Significant Impact	Impact Can and Will be Mitigated	Insignificant Impact	Not Applicable
A. Growth Inducing Effects	()	()	()	()
B. Precedent for Change in Area Land Use	()	()	()	()
C. Cumulative Effects: _____	()	()	()	()
D. Other: _____	()	()	()	()

Mitigation: A _____ B _____ C _____ D _____

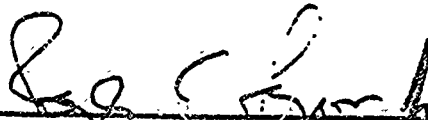
See attached exhibit(s)	()
See Special Environmental Considerations	()
See Document in file _____	()

(3504u)

Developers Statement ABALONE FARM DEVELOPMENT PLAN
E.D. 88-200; DEVELOPMENT PLAN APPLICATION
NO. D870182D

The applicant agrees to incorporate the following measures into the project. These measures become a part of the project description and therefore become a part of the record of action upon which the environmental determination is based. The applicant understands that any other changes made to the project may require a new environmental determination for the project.

See Attachment "A" incorporated herein by this reference. All references in Attachment "A" to "Figures," "Appendices" are to the expanded initial study for this project dated November 22, 1988, prepared by the Morro Group.


Name ROGER C. LYON, JR., Attorney
for Applicant ABALONE FARM, INC.

December 6, 1988
Date

SM:tb/mm
ds (key)

ATTACHMENT "A"

I. GENERAL MITIGATION MEASURES:

- A. Concentrated runoff from the site will not be allowed to flow over the coastal bluff, but should be intercepted before reaching the bluff and diverted to control devices.
- B. All areas of recent fill along the edge of the bluff will be planted to fast-growing grasses at the onset of the wet season to minimize first-year erosion, with native, salt-tolerant vegetation being introduced as rapidly as feasible for long-term stability.
- C. Facilities to discharge collected runoff and seawater from the tanks on the site will be constructed so that the released water does not impact on the terrace deposits, but is released onto bedrock or the gravel beach. For most locations at the site, piping will extend down the bluff to an elevation of approximately 20 feet above mean sea level.
- D. Discharge facilities will be constructed so that they can be periodically modified to accommodate changing bluff configurations. The large diameter PVC pipe now in use would appear to be ideal for this purpose.

II. MITIGATION MEASURES FOR THE EXISTING ARLONE FARM FACILITIES:

- A. Drainage control will be improved at Points A and B (Figure 5), north of the Alexander Marine Research Laboratory, so that concentrated runoff is conveyed westerly along the access road to the primary collection Point C rather than crossing the road and flowing to the bluff along uncontrolled channels.
- B. An open concrete "V" ditch, similar to that along the southerly edge of the east raceway tanks, will be installed southerly from the west raceway tanks. This ditch could be located in the center or along the southerly edge of this access road. The ditch will be designed to carry the total seawater flow to these tanks in the event of a spill, or runoff from the local area for a 100-year storm, whichever is greater. The area between this access road and the bluff (now loose fill) will be graded to direct surface flow back to the "V" ditch to the extent that this is feasible.
- C. Drainage facilities along the road to the intake pumphouse will be revised as follows:
 1. The intake to the pipe at the bottom of the road will be improved to include a concrete box configured to minimize sediment clogging (i.e., edges

raised above road level but below the level of the berm at the south edge of the road).

2. Concentrated runoff from above the steep segment of this road (easterly of Point D on Figure 5) will be intercepted and conveyed to the box inlet at the bottom of the road by a pipe buried in the roadway. (This improvement is intended to minimize runoff flowing down the steep segment of the road and consequent erosion and sedimentation at the box inlet.)
3. Runoff from the steep segment of the road will be channeled in a non-erosive device located in the center of the road or on the inland side of the road, and conveyed to the box inlet at the bottom end of the road.
4. Discharge from the pipe from the box inlet will be onto bedrock and not onto the softer terrace deposits (i.e., at or below elevation approximately 20 feet).

III. SPECIFIC MITIGATION MEASURES FOR THE ABALONE FARM EXPANSION FACILITIES:

- A. Control of excess surface runoff or a spill of seawater from the expansion facilities will be controlled by providing an open concrete ditch along the southerly perimeter of the facility.
- B. Diversion and control of runoff flowing toward the expansion facility will be governed by the General Mitigation Measures above.

IV. SPECIFIC MITIGATION MEASURES FOR THE ALEXANDER MARINE RESEARCH LABORATORY:

- A. Within thirty (30) days of issuance of the negative declaration, a qualified geologist will visit the site and determine if the seepage from the concrete pond is still significant or whether the leak has been adequately mitigated. In the event the geologist determines the seepage is still significant, the supply of water to the pond by the applicant will be terminated.
- B. The drainage course along the southeasterly side of the concrete pond will be improved to conform to the general recommendations listed above.

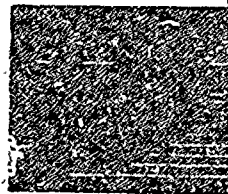
CALENDAR PAGE	81
MINUTE PAGE	2672

Expanded Initial Study
ABALONE FARM DEVELOPMENT PLAN

ED-88-200 D870182D

Prepared for:
Office of the Environmental Coordinator
County of San Luis Obispo

Prepared by:
The Morro Group



P.O. Box 6297
Los Osos, CA 93412

November 22, 1988

CALENDAR PAGE	<u>82</u>
MINUTE PAGE	<u>2673</u>

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. SUMMARY	2
III. PROJECT DESCRIPTION	6
IV. ENVIRONMENTAL SETTING	
A. Physical Setting	13
B. Consistency with Applicable Plans and Policies	13
V. ANALYSIS OF ENVIRONMENTAL ISSUES	
A. Geologic Hazards	17
B. Drainage and Erosion	22
C. Biological Resources	28
C. Archaeological Resources	29
D. Visual Considerations	30
E. Traffic	34
F. Air Quality	35
<u>Appendices:</u>	
Appendix A Engineering Geology Report	A-1
Appendix B Terrestrial Biology Report	B-1
Appendix C Marine Biology Report	C-1

LIST OF FIGURES

1. Location map	7
2. Project map	8
3. Views of existing facilities and the expansion area	9
4. Views of the outfall structures and the intake facilities	10
5. Layout and grading plan for expansion of the raceway tanks	11
6. Cross sections through raceway tanks and headworks	12
7. Rates of bluff retreat	20
8. Surface runoff	23
9. Hydrologic map of the access road area	25
10. Index to views to/from Highway 1	31
11. Views to/from Highway 1	32
12. Visibility of the site from Highway 1	33

I. INTRODUCTION

The proposed project is a request to construct additional facilities for the raising of abalone at the Abalone Farm located approximately 1/2 mile southwest of Highway 1, 1/2 mile west of the mouth of Villa Creek, and approximately 6 miles west of Cayucos. The proposed facilities are additional raceway tanks which are used to raise the abalone to marketable size. The existing hatchery and nursery facilities are adequate to support the expanded raceway tanks.

The existing facilities have been operating under a lease from John Alexander, owner of the property and operator of the Alexander Marine Research Laboratory which is adjacent to the existing Abalone Farm. However, the existing facilities have not previously received a permit from the County, and the initial grading of the expansion area has precipitated permitting under the Local Coastal Plan with environmental review as required under the Plan.

Environmental issues identified in the review of this proposal include: setback for coastal bluff retreat; control of surface runoff and bluff erosion; terrestrial biological resources; marine biological resources; archaeological resources; effects on views from Highway 1; and effects on traffic on Highway 1 and air quality. This Expanded Initial Study addresses these concerns. The results of the analysis are summarized below, and the detailed analyses are included under Analysis of Environmental Issues.

II. SUMMARY

Geologic Hazards

- Analysis of rates of bluff retreat at the site indicate that the proposed expansion is located well inland of the projected 75-year edge of bluff.
- The raceway tanks at the existing facilities and the seawater pond at the Alexander Marine Research Laboratory may be affected by bluff retreat within the next 75 years. However, the value of these facilities is such that it is unlikely that expensive bluff protection measures would be proposed to protect these facilities.
- No other geologic hazards have been identified at the site and no mitigation measures are proposed.

Drainage and Erosion

- Erosion of the coastal bluff adjacent to the existing facilities appears to have occurred in the past as a result of concentrated surface runoff and/or overflow of the raceway tanks due to plugging or other failures in the seawater discharge facilities.
- Overflows due to plugging of the seawater discharge facilities have been largely eliminated by converting piping to open concrete channels with short, easily cleaned sections of pipe only where required.
- Surface runoff is a problem at some locations within the existing facilities, and measures are recommended to improve the control of concentrated runoff.
- Runoff from the access road, as it may result in erosion and sedimentation downstream in the adjacent "wetland" at the mouth of Villa Creek, has been investigated, and erosion from the road and sedimentation downstream are insignificant.
- Seepage from the bluff at the terrace bedrock contact suggests that leakage from the large concrete-lined pond at the Alexander Marine Research Lab is substantial. This condition poses a significant potential for large-scale failure of the terrace section in the bluff on the seaward side of the pond.
- Potential impacts resulting from erosion by concentrated runoff or spills of seawater from the raceway tanks can be avoided or minimized by implementing the following mitigation measures:

General Recommendations

- Concentrated runoff from the site shall not be allowed to flow over the coastal bluff, but shall be intercepted before reaching the bluff and diverted to control devices.
- All areas of recent fill along the edge of the bluff shall be planted to fast-growing grasses at the onset of the wet season to minimize first-year erosion. Native, salt-tolerant vegetation should be introduced as rapidly

as feasible for long-term stability. A list of species is included on page 6 of Appendix B.

- Facilities to discharge collected runoff and seawater from the tanks on the site shall be constructed so that the released water does not impact on the terrace deposits, but is released onto bedrock or the gravel beach. For most locations at the site, piping should extend down the bluff to an elevation of approximately 20 feet above mean sea level.
- Discharge facilities should be constructed so that they can be periodically modified to accommodate changing bluff configurations. The large diameter PVC pipe now in use would appear to be ideal for this purpose.

Specific Recommendations for the Existing Abalone Farm Facilities

- Drainage control shall be improved at Points A and B (Figure 8), north of the Alexander Marine Research Laboratory, so that concentrated runoff is conveyed westerly along the access road to the primary collection point C rather than crossing the road and flowing to the bluff along uncontrolled channels.
- An open concrete "V" ditch, similar to that along the southerly edge of the east raceway tanks, shall be installed southerly from the west raceway tanks. This ditch could be located in the center or along the southerly edge of this access road. The ditch shall be designed to carry the total seawater flow to these tanks in the event of a spill, or runoff from the local area for a 100-year storm, whichever is greater. The area between this access road and the bluff (now loose fill) shall be graded to direct surface flow back to the "V" ditch to the extent that this is feasible.
- Drainage facilities along the road to the intake pumphouse should be revised as follows:
 - The intake to the pipe at the bottom of the road shall be improved to include a concrete box configured to minimize sediment clogging (i.e., edges raised above road level but below the level of the berm at the south edge of the road).
 - Concentrated runoff from above the steep segment of this road (easterly of Point D on Figure 8) shall be intercepted and conveyed to the box inlet at the bottom of the road by a pipe buried in the roadway. (This improvement is intended to minimize runoff flowing down the steep segment of the road and consequent erosion and sedimentation at the box inlet.)
 - Runoff from the steep segment of the road shall be channeled in a non-erosive device located in the center of the road or on the inland side of the road, and conveyed to the box inlet at the bottom end of the road.
 - Discharge from the pipe from the box inlet shall be onto bedrock and not onto the softer terrace deposits (i.e., at or below elevation approximately 20 feet).

Specific Recommendations for the Abalone Farm Expansion Facilities

- Control of excess surface runoff or a spill of seawater from the expansion facilities shall be controlled by providing an open concrete ditch along the southerly perimeter of the facility.
- Diversion and control of runoff flowing toward the expansion facility shall be governed by the General Recommendations above.

Specific Recommendations for the Alexander Marine Research Laboratory

- Leakage from the concrete pond shall be stopped or reduced to a level of insignificance, or the use of this facility shall be terminated. Seepage at the bluff is substantial, and piping, with a major increase in the volume of flow and the possible collapse of the terrace underlying the seaward side of the pond, could develop at any time. The result could be a major scar on the coastal bluff.
- If use of this facility is to be terminated, then it shall be removed and the site returned to its original configuration to the extent that this is feasible.
- The drainage course along the southeasterly side of the concrete pond shall be improved to conform to the General Recommendations listed above.

Biological Resources

- A terrestrial botanical investigation of the site has been conducted, and no sensitive plant species are present on the site. No mitigation measures are required.
- A marine biological investigation of the intertidal and near-shore habitats adjacent to the site has been conducted, and no significant impacts to this environment have been identified.

Archaeological Resources

- A subsurface archaeological investigation of the expansion area has been conducted, and additional grading in the area southerly of the cut bank at the north edge of the graded area need not be monitored.
- Additional grading north of the cutbank in the expansion area (i.e., more than 20 feet north of elevation point 58.0 on Figure 2) shall be monitored by an archaeological team, including a Native American, to collect any archaeological materials that may be encountered.

Visual Considerations

- The expansion area is not visible from Highway 1, and no significant visual impacts are expected as a result of the proposed project.

- Some of the buildings (i.e., particularly the nursery buildings) in the existing facilities are visible from Highway 1, and the applicant has agreed to provide screening along the easterly edge of the site and in front of the nursery buildings. Cypress have been planted as proposed, and a drip irrigation system has been installed. No other mitigation measures are proposed.

Traffic

- Increased traffic on Highway 1 resulting from increased employment required to operate the expansion will be insignificant (worst-case increase of 0.5% in peak-hour traffic), and no mitigation measures are required.

Air Quality

- Effects on air quality resulting from increased traffic on Highway 1 will be insignificant, and no mitigation measures are required.

III. PROJECT DESCRIPTION

The proposed project is located on the coastal terrace approximately 1/2 mile west of the mouth of Villa Creek and 1/2 mile southwest of Highway 1 (Figure 1). The westerly portion of the site is now used for the hatching and raising of abalone, and implementation of the project would expand the area of raceway tanks in which the abalone spend the latter half of the period of growth to marketable size.

Facilities now on the site include an office, hatchery, nursery and raceway tanks (Figure 2). The primary seawater intake structure and pumphouse are located at the southwesterly corner of the site, and a secondary intake facility is located approximately 150 feet to the east. The main outfall is located near the southeasterly corner of the area of existing facilities of the Abalone Farm, near the Alexander Marine Research Laboratory. Temporary raceway tanks are located just south of the proposed expansion area, and the outfall from these tanks is located approximately 100 feet to the south. The proposed Development Plan would provide the land use permit for these uses.

Views of these facilities are shown on Figures 3 and 4 as follows:

- Figure 3, upper right, shows the office, nursery buildings, and existing raceway tanks as seen from the promontory in the south-central part of the site (Figure 2).
- Figure 3, upper left, shows the primary and secondary seawater intake facilities as seen from the promontory in the south-central part of the site (Figure 2).
- Figure 4, bottom, shows the primary seawater intake and pumphouse as seen from the access road to this facility.
- Figure 4, upper left, shows the outfall from the existing facilities. Note that discharge is onto gravel on the rocky beach below.
- Figure 4, upper right, shows the outfall from the temporary tanks. Note that discharge is onto rock within a reentrant along the bluff.

The location of the proposed expansion area as viewed from the north near the intersection of the road to the existing facilities and the road to the Alexander residence is shown on the bottom of Figure 3. The site has been partially graded. The design of the proposed expansion of the raceway tanks is shown on Figures 5 and 6. Figure 5 is a map view at the same scale as Figure 2 showing the locations of the tanks and headworks, and the grading required to implement these facilities. Figure 6 is a cross section through the headworks and the tanks showing the step-down of the tanks along existing grade and detail of the locations of the water filter and air pump in the headworks.

The existing seawater intake facilities are adequate to also supply the expansion of the raceway tanks. The outfall now used for the temporary tanks will be used for the expansion facilities, probably with the addition of more pipes.

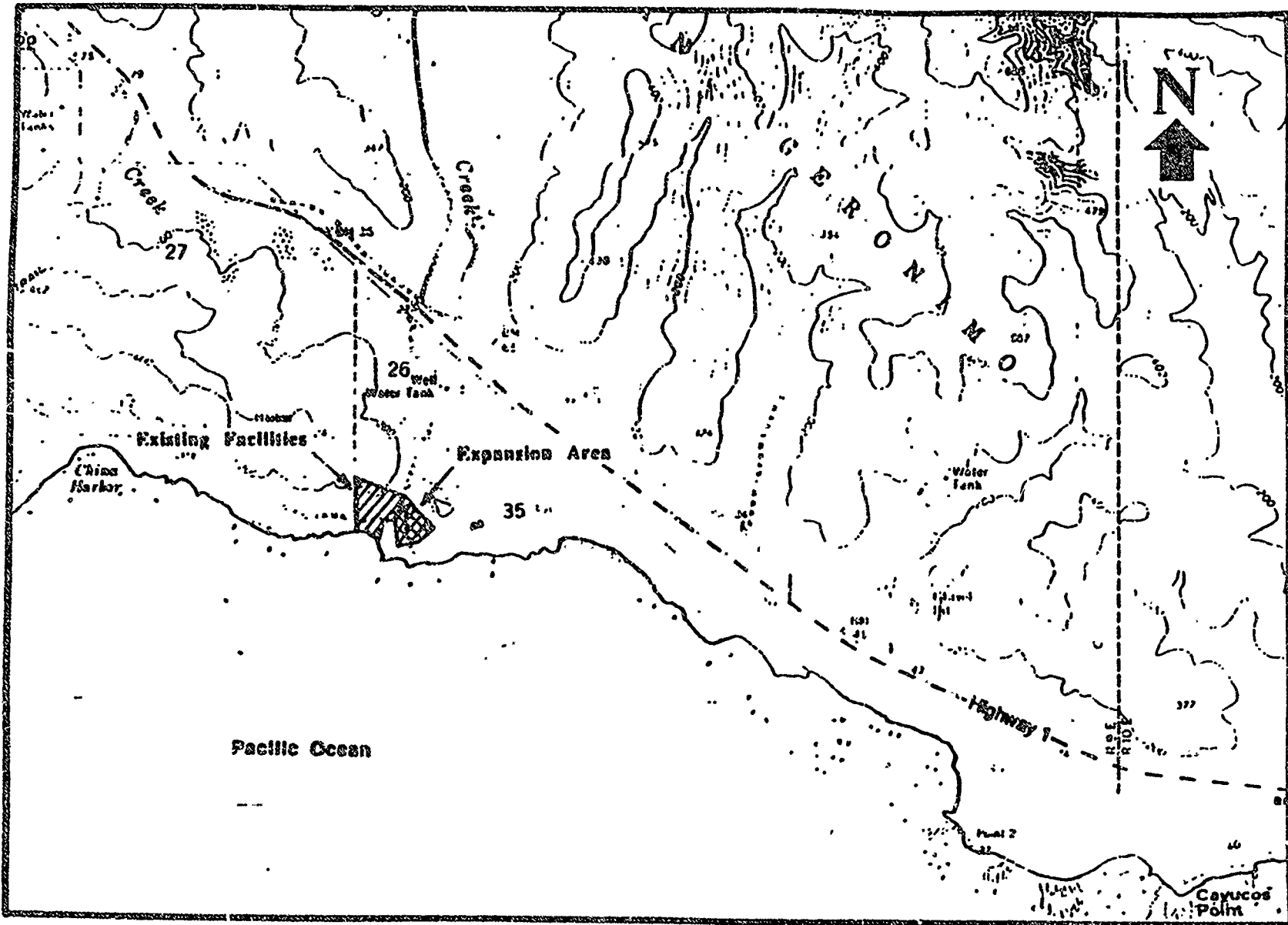
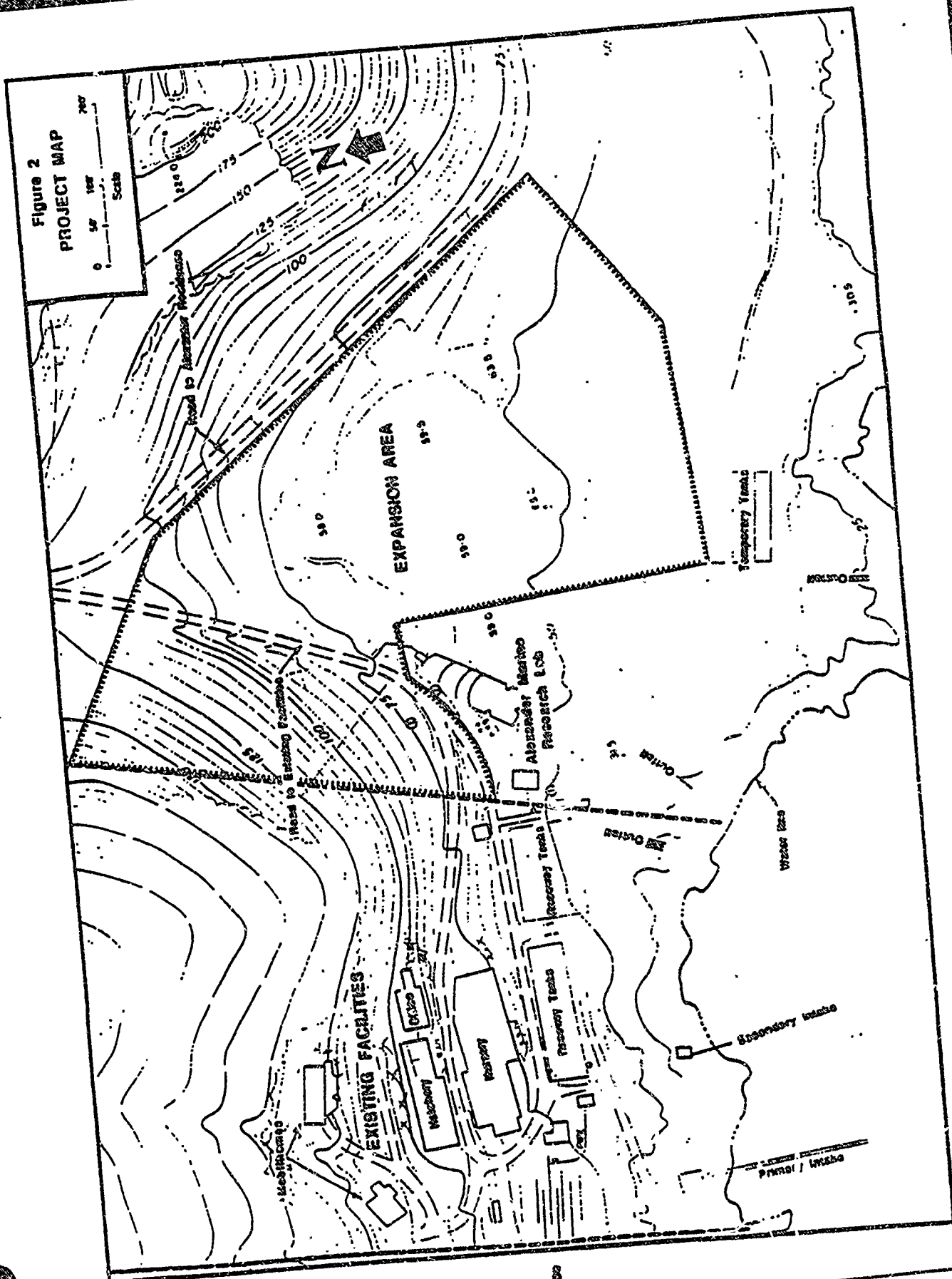


Figure 1. Location Map. Base from USGS Cayucos Quadrangle, culture current to 1965. Scale: 1" = 2,000'

CALENDAR PAGE
MINUTE PAGE

90
2001



CALENDAR PAGE
MINUTE PAGE

91
2633

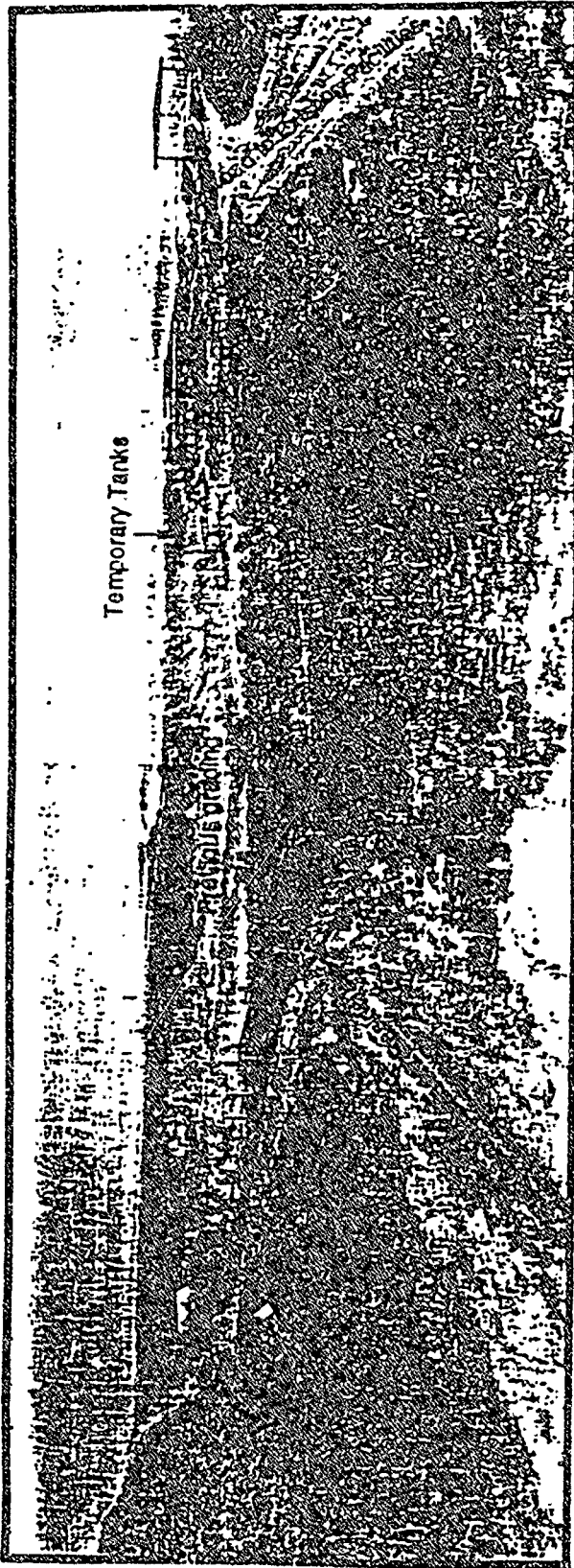
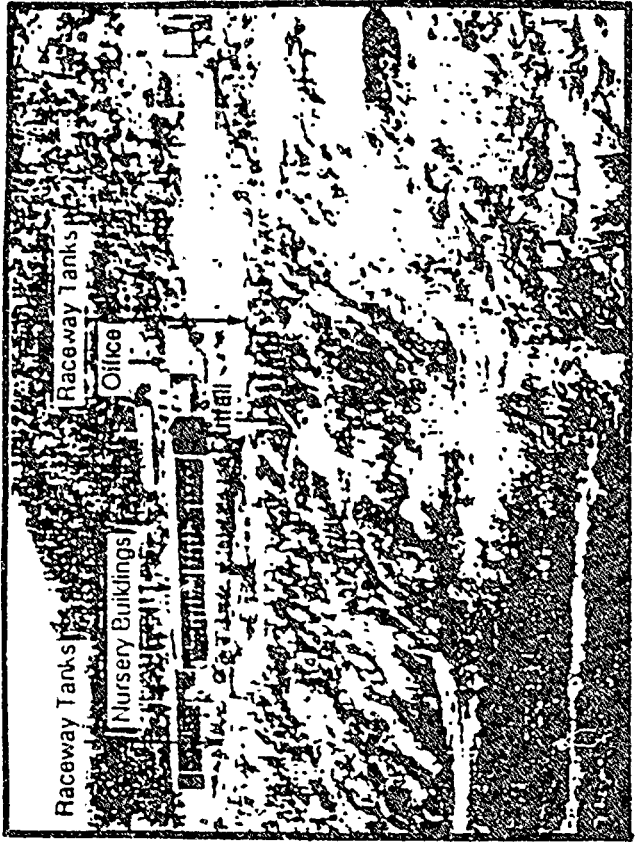
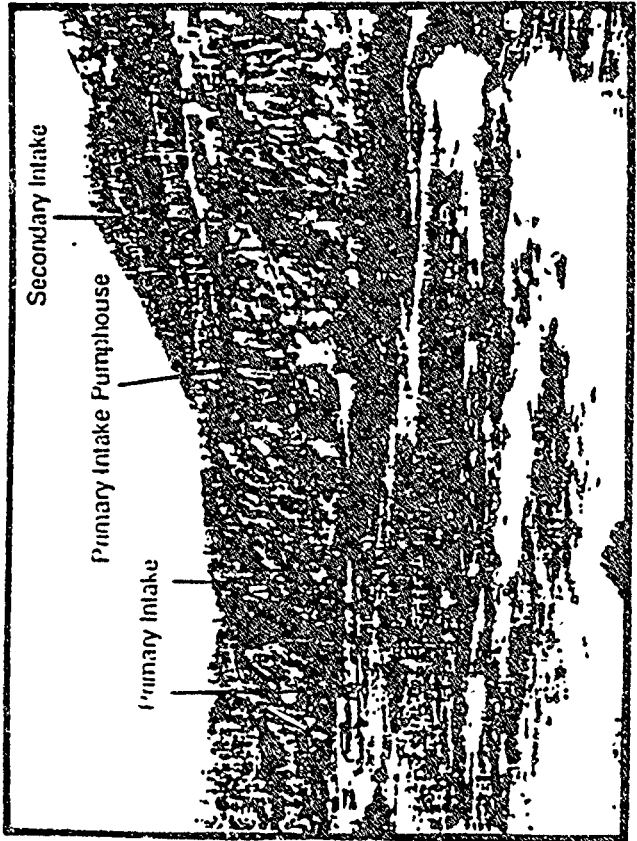


Figure 3. Views of existing facilities (top) and the expansion area (bottom).

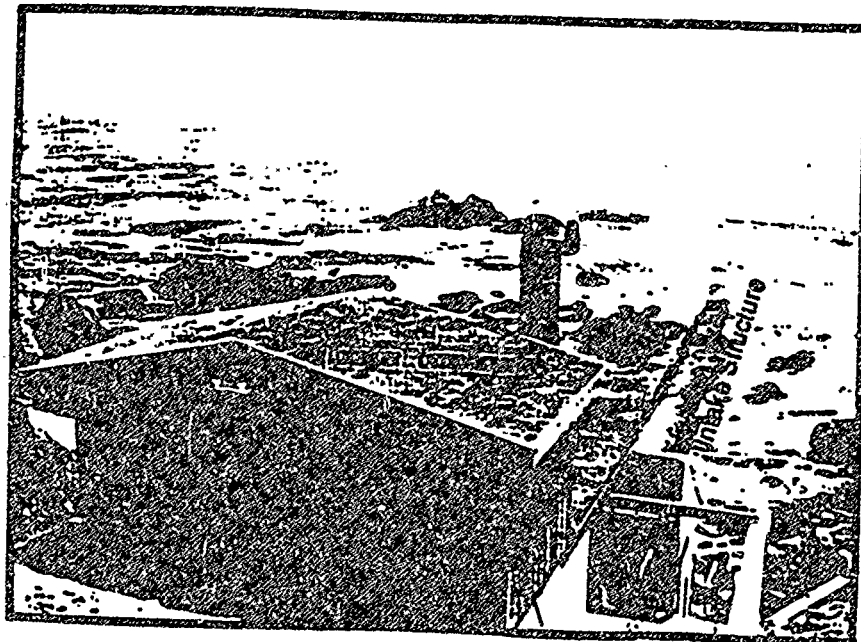


Figure 4. Views of the outfall structures (top) and the intake facilities (bottom).

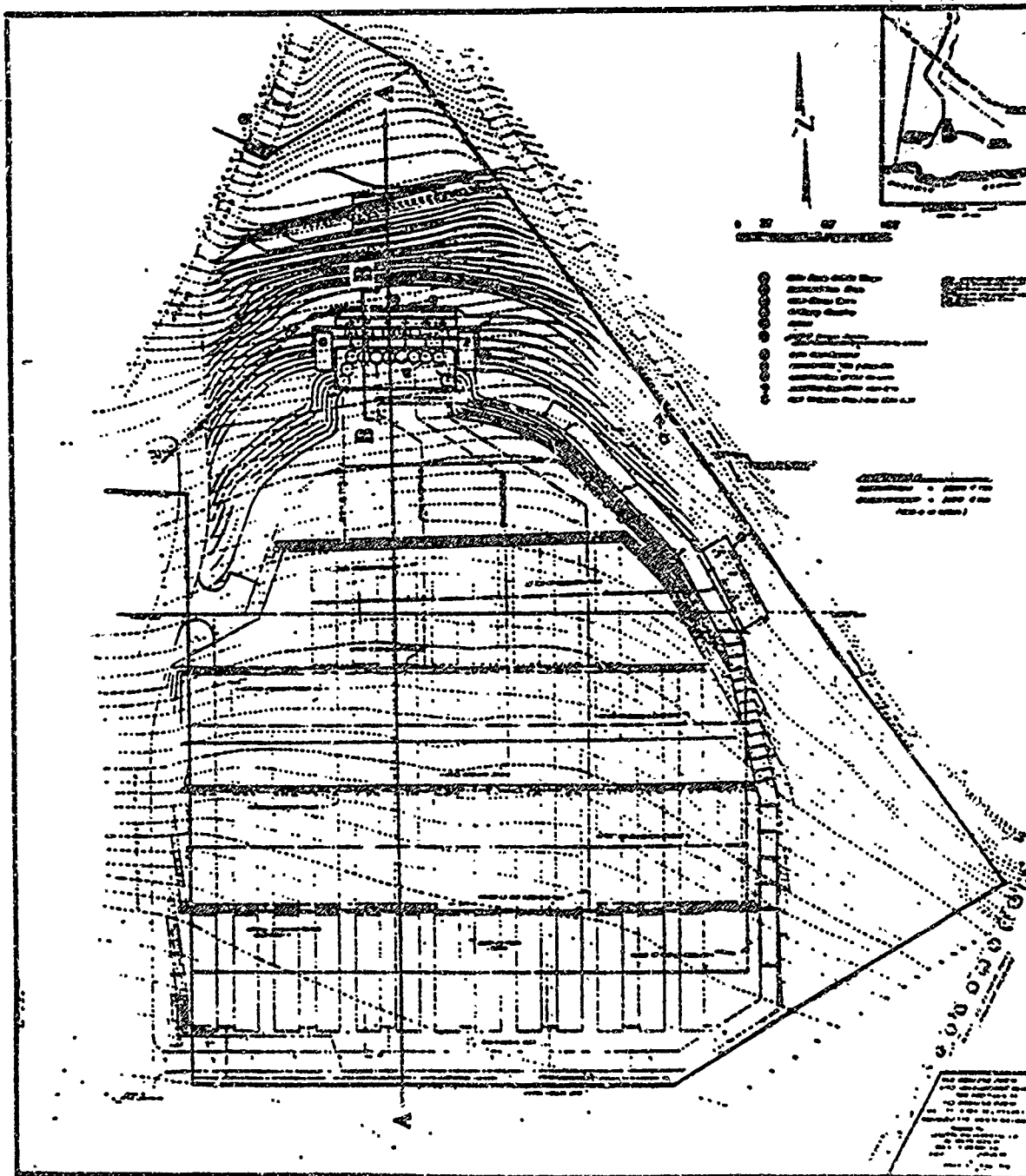


Figure 5. Layout and grading plan for expansion of raceway tanks.

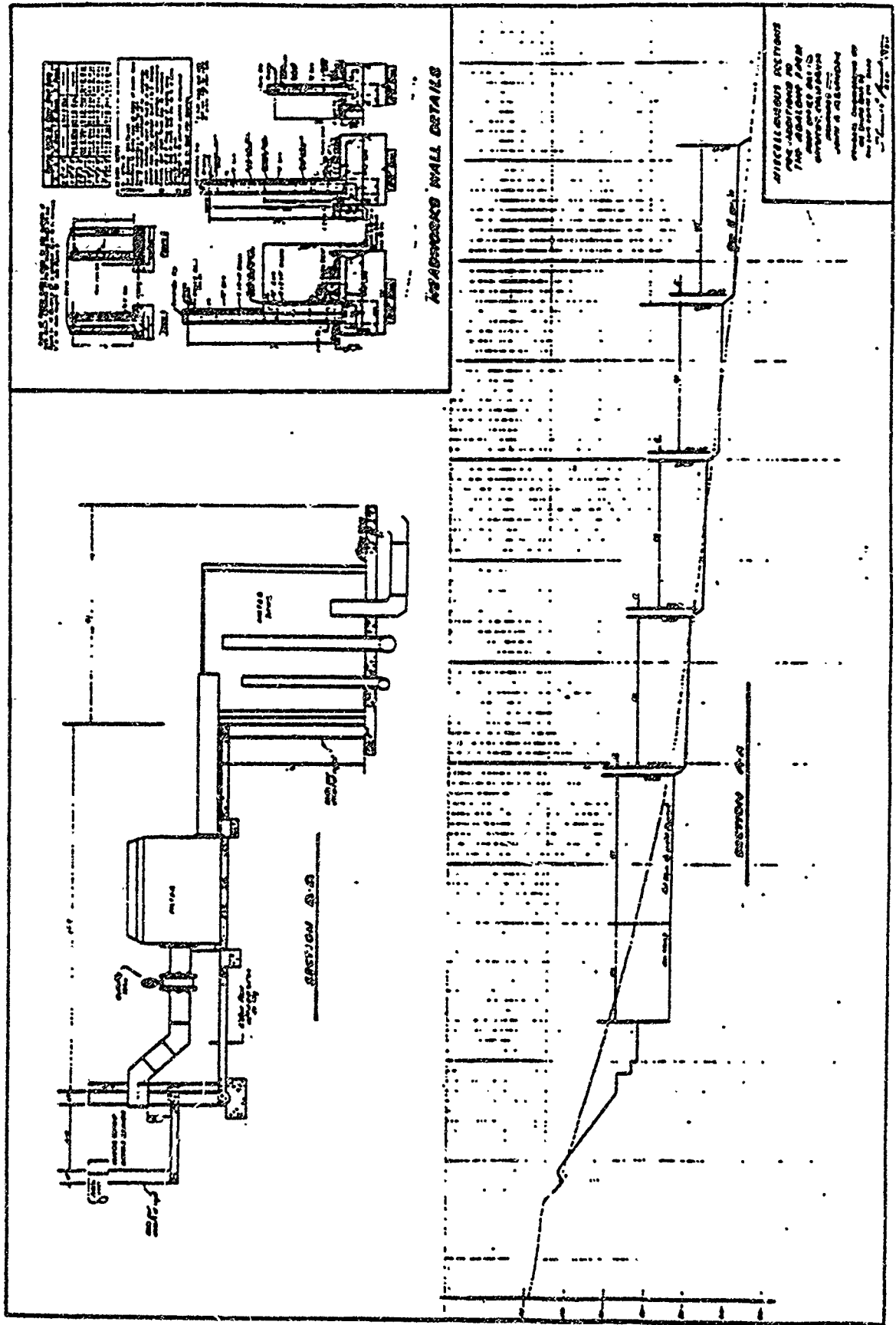


Figure 6. Cross sections through raceway tanks (bottom) and headworks (top).

IV. ENVIRONMENTAL SETTING

A. PHYSICAL SETTING

The proposed project is located on the coastal terrace at a location where slopes are in the range of 5-20%. Some existing facilities have been located on slopes up to approximately 35%, but the area of new development is relatively flat. The site is underlain by terrace deposits composed primarily of silty fine sands that support vegetation consisting primarily of introduced grasses. Bedrock, composed primarily of resistant sandstone, underlies the terrace deposits at depths ranging from about 5 feet at the edge of the bluff in the easterly part of the site to 35 feet or more at the bluff in the westerly part of the site. The bedrock rises to a height of 20-25 feet in the coastal bluff, which provides good resistance to wave erosion. Water depths offshore are shallow, and numerous rocks and small islands are exposed in the near offshore area.

The site is now used for raising abalone for market, and the project is to expand the area of raceway tanks where the abalone spend the latter half of their period of growth.

Pictures of various parts of the site are included as Figures 3 and 4 in the Project Description above. Access to the site is by dirt road from Highway 1 just north of the Villa Creek bridge.

B. CONSISTENCY WITH APPLICABLE PLANS AND POLICIES

The project site is located in the Coastal Zone in the Escondido Planning Area, and is subject to the Local Coastal Zone Land Use Element (CZLUE) and Coastal Zone Land Use Ordinance (CZLUO).

1. Land Use

The CPLUE designates the site as Agriculture. Coastal Table 'O' designates aquaculture as an allowable use in such designations provided the soils are non-prime. The Soil Survey of San Luis Obispo County, Coastal Part (Ernstrom, 1984), classifies the soils on the coastal terrace portion of the site as Still gravelly sandy clay loam, 2 to 9% slopes (map unit 210) which is in capability unit IIe-4 (prime) when irrigated and IIIe-4 when not irrigated.

Comment: The site itself does not have a reliable source of irrigation water, but it may be technically feasible to pump water from the underflow of Villa Creek to the north, and pump it over the ridge to the site. It is unlikely that a project of this extent would be economically feasible on such a small area. Also, while the soils on the terrace portion of the site may be prime when irrigated, areas adjacent to the ocean in this part of the County are not used for intensive agriculture probably because of the severe climatic conditions during most of the year. Based on these considerations, the site is probably not suitable for intensive agriculture, and the proposed use would appear to be allowable within the Agriculture designation.

2. Combining Designations

The site is part of a Sensitive Resource Area (SRA) that extends along the coast from Villa Creek westward to the limit of the Planning Area. This SRA is apparently the Ocean Shoreline. Concerns include "maintaining open views of the shoreline and ocean from

Highway 1 and the long term option for additional public recreation areas, and, if privately developed in the future, maintaining maximum public access to the immediate shoreline.

Comment: Views from Highway 1 are addressed in this Expanded Initial Study, and no significant impacts have been identified. Vertical access from Highway 1 is designated on the Circulation map at the mouth of Villa Creek to the east of the site, but not at the site itself. The project would, therefore, appear to avoid concerns related to this SRA.

The site is not designated a Geologic Study Area (GSA) for Bluff Erosion, but probably should be.

Comment: Bluff retreat is addressed in this Expanded Initial Study, and the proposed project is not within areas subject to retreat within 75 years. Parts of the existing facility may encounter problems within the 75-year period. However, removing and replacing these facilities elsewhere on the site will be much less costly than a shoreline protection structure. The project would, therefore, appear to be consistent with the GSA.

The area north of the existing facilities and expansion area which includes the access road to the site is designated "wetlands" on Map 2 of the Estero Combining Designations Map.

Comment: Hydrologic mapping of the area along the access road draining to the "wetlands" is included in the Drainage and Erosion section of this Expanded Initial Study.

3. Planning Area Standards

a. Sensitive Resource Area

3. Location Criteria. *Locate all new development (excluding utility corridors where it is demonstrated that the alternative will be visually less obtrusive and environmentally less damaging) so that preferably no new structures extend above the highest horizon line of knolls, hilltops, and ridgelines such that the structure is silhouetted against the sky when viewed from nearby collector or arterial roads. When such siting is infeasible or environmentally more damaging, the structures shall require Development Plan review and shall be designed and be of such materials and colors to be harmonious and unobtrusive as feasible.*

Comment: Since no new structures extend above the highest horizon line of knolls, hilltops, and ridgelines such that the structure is silhouetted against the sky when viewed from nearby collector or arterial roads, the project would appear to be consistent with this standard.

4. Location Criteria - Sloping Sites. *New building sites and driveways are limited to locations where site slopes are less than 30%.*

Comment: No new building sites or driveways are proposed on slopes exceeding 30%, and the project would appear to be consistent with this standard.

6. Site Planning - Development Plan Projects. Projects requiring Development Plan approval are to concentrate proposed uses in the least sensitive portions of properties. Native vegetation is to be retained as much as possible.

Comment: A biological survey of the site has been conducted and no sensitive plant species have been identified on the site. The project would appear to be consistent with this standard.

b. Agriculture

1. Site Selection. New development is to concentrate residential and agricultural structural structures in the non-prime areas where terrain, access and agricultural operations would permit.

Comment: The proposed project will not interfere with any existing or planned agricultural operations, and the project would appear to be consistent with this standard.

4. Land Use Ordinance Section 23.07.160, Sensitive Resource Area (SRA)

The proposed project is located within the Ocean Shoreline SRA, and provisions of Section 23.07.160 of the Coastal Zone Land Use Ordinance are applicable. This section establishes detailed procedures and standards for the processing of development applications within SRAs, and identifies specific investigations that must be conducted prior to the making of an environmental determination and the subsequent processing of the project. Standards applicable to the project and investigations required by this section are discussed below.

23.07.166 - Minimum Site Design and Development Standards: All uses within a Sensitive Resource Area shall conform to the following standards:

- b. Shoreline areas shall not be altered by grading, paving, or other development of impervious surfaces for a distance of 100 feet from the mean high tide line, 75 feet from any lakeshore, or 50 feet from any streambank, except where authorized through Development Plan approval. Where the requirements of

Comment: The proposed project will not alter shoreline areas for a distance of 100 feet or more from the mean high tide line, except for the intake and outfall structures, and lakeshores or streambanks are not present. The outfall and intake structures do not increase runoff. The project would appear to be consistent with this requirement.

- c. Construction and landscaping activities shall be conducted to not degrade lakes, ponds, wetlands, or perennial watercourses within an SRA through filling, sedimentation, erosion, increased turbidity, or other contamination.

Comment: The project as proposed will not affect any of the sensitive features included above. However, the existing access to the site does cross a "wetland", and potential erosion and sedimentation related to this access route is an issue related to the project. Hydrologic mapping of the area along the access route and comment on erosion and sedimentation in the adjacent "wetland" are

included in the Drainage and Erosion section of this Expanded Initial Study. No adverse effects have been identified, and the project would appear to be consistent with this requirement.

23.07.170 - Environmentally Sensitive Habitats: The provisions of this section apply to development proposed within or adjacent to (within 100 feet of the boundary of) an Environmentally Sensitive Habitat as defined by Chapter 23.11 of this title, and as mapped by the Land Use Element combining designation maps.

Comment: No development is proposed within or adjacent to the environmentally sensitive habitat at the mouth of Villa Creek, but access to the site is along an existing road across the upper end of this "wetland" and along its westerly side. Hydrologic mapping of the area along the access route and comment on erosion and sedimentation in the adjacent "wetland" are included in the Drainage and Erosion section of this Expanded Initial Study. No adverse effects have been identified, and the project would appear to be consistent with this requirement.

23.07.176 - Terrestrial Habitat Protection: The provisions of this section are intended to preserve and protect rare and endangered species of terrestrial plants and animals by preserving their habitats. Emphasis for protection is on the entire ecological community rather than only the identified plant or animal.

Comment: A botanical investigation of the site has been conducted, and no sensitive plant species are present.

23.07.178 - Marine Habitats: The provisions of this section are intended to preserve and protect habitats for marine fish, mammals and birds. Development within or adjacent to marine habitats is subject to the provisions of this section.

- a. Protection of kelp beds, offshore rocks, reefs and intertidal areas. Development shall be sited and designed to mitigate impacts that may have adverse effects upon the habitat, or that would be incompatible with the continuance of such habitat areas.*
- b. Siting of shoreline structures. Shoreline structures, including piers, groins, breakwaters, seawalls and pipelines shall be designed or sited to avoid and to minimize impacts on marine habitats.*
- c. Coastal access. Coastal access shall be monitored and regulated to minimize impacts on marine resources. If negative impacts are demonstrated, then the appropriate agency shall take steps to mitigate these impacts, including limitations on the use of the coastal access.*

Comment. The project would appear to be subject to this section. The existing operations and the sites of proposed operations affecting marine resources have been investigated by a marine biologist, and no significant adverse effects on marine resources have been identified.

V. ANALYSIS OF ENVIRONMENTAL ISSUES

A. GEOLOGIC HAZARDS

1. Existing Conditions

An engineering geologic report has been prepared for the project to conform with the requirements of Section 23.04.118b of the Coastal Zone Land Use Ordinance. That report is attached as Appendix A, and its content related to geologic hazards is summarized below. Information related to bluff erosion is addressed in the next section.

a. Geologic Units

The area of the project site has been mapped by Hall (1974) at a scale of 1"=2,000, and the bedrock in the area is Cretaceous sandstone which is the dominant unit underlying the coastal bluffs from the area of the site north to the community of Cambria. This unit is composed primarily of medium grained, arkosic sandstone that is hard, resistant to erosion, and stable under most geologic conditions. However, thin beds of siltstone and claystone are present in some areas between the massive to thick bedded sandstones, and overall resistance to erosion is primarily related to the distribution of these weaker units.

The terrace deposits are composed of silty and clayey sands that are only partially consolidated and much more susceptible to erosion than the underlying bedrock. In the easterly half of the study area, the thickness of the terrace deposits at the edge of the bluff varies in the range of 3-5 feet, and the top of the bedrock is consistently at an elevation of approximately 20-25 feet. However, beginning at a point westerly of the Temporary Tanks, the thickness of terrace deposits increases northwesterly to approximately 35-40 feet near the westerly boundary of the existing abalone facilities. In these areas where the terrace at the bluff is much thicker, the elevation of the top of the bedrock is at an elevation of 20-25 feet as it is to the east where the terrace deposits are much thinner.

b. Geologic Structure

The orientation of bedding planes in the Cretaceous sandstone sequence at the site is primarily northerly with dip to the east at medium to steep angles. This alignment is consistent with those of physical features along the bluff and the rocks offshore. The bedrock in the area is highly fractured and jointed, but the alignments of these rock features do not appear to control to any significant extent variations in the rates of retreat of the bluff. That the bedrock is fractured contributes to its erodability, but fracture and joint patterns are not significantly affecting the locations of retreat.

c. Bluff Retreat

Coastal bluffs on the Central Coast normally include a lower section composed of bedrock with a relatively high but variable degree of resistance to wave erosion, and an upper section composed of terrace deposits that have a relatively low degree of resistance to wave erosion. Where bedrock extends significantly (i.e., 10-15 feet or more) above the zone of effective wave attack (i.e., above the shore-line angle), bluff retreat is controlled almost totally by the characteristics of the bedrock units. However, where the bedrock is low in the coastal bluff (less than 5 feet), erosion at the edge of the bluff is controlled primarily by the resistance of the overlying terrace deposits, and the degree to which the beach seaward

of the bluff is erodible. This condition is relatively limited on the Central Coast, but where it is present relatively high rates of retreat are common. Examples include the bluff in north Morro Bay and southern Cayucos, Pismo Beach near the pier, and Montana de Oro just north of the mouth of Hazard Canyon where 30-50 feet of bluff was lost in the 1983 storms alone.

At the project site, bedrock is high in the bluff (20-25 feet), and retreat from wave erosion is controlled primarily by the resistance of the bedrock units. Also, the wave-cut platform is shallow for several hundred feet offshore, and numerous rocks are exposed at mid- to low-tide for distances of 300 to 400 feet offshore. This condition extends offshore for at least 1/2 mile as shown by the seaward protrusion of the depth contours on Figure 1 and the presence of kelp beds offshore. There are gravel deposits on some of the beaches along the bluff at the site. However, these are thin (a foot or so), and the sea bottom offshore can be considered as being bedrock and not easily erodible.

Rates of the retreat of coastal bluffs can be determined from historical evidence such as photographs (aerial or ground locations) of the same area taken at different times, or survey maps of the bluff edge or survey points that have been referenced to the bluff edge. This type of evidence is normally available for areas urbanized several tens of years ago (i.e., Los Angeles-San Diego region), but it is not generally available for rural regions which include most of San Luis Obispo County. Exceptions include the Dinosaur Caves-Shelter Cove area of Pismo Beach where large-scale Caltrans aerial photographs were utilized to establish rates of retreat over the last 30 years (Asquith, 1983), the South Palisades area of Pismo Beach where a pipeline near the bluff provides a long-term line of reference, and the Pirate's Cove area of Avila Beach where near-bluff physiographic features have not been significantly altered and where rates of retreat are locally high.

These studies establish rates of retreat in rock for the Central Coast generally as follows:

<u>Geologic Condition</u>	<u>Average Rate of Retreat (ft/yr)</u>
Hard, resistant rocks (e.g., Obispo tuffs and older hard rocks)	<0.2
Medium resistant rocks (e.g., Miocene shales and siltstones)	0.2-0.4
Low resistant rocks (e.g., folded and fractures shales and siltstones)	0.4-0.8
Very low resistant rocks (e.g., landslide debris)	1.0-2.0 or higher

Aerial photographs available in the County files and past surveys of the site have been reviewed, and no information has been identified that would further refine local rates of bluff retreat beyond those that can be assigned on a general basis. That is, available aerial photographs are at scales in the range of 1,000-2,000 ft/in, and threshold measurements of approximately 0.02 inches equate to distances of 20 to 40 feet, or the retreat that would be expected with the normal range of conditions in 50 to 100 years. These photographs, therefore do not provide useful information unless rates of retreat are substantially above normal levels.

Land surveys are sometimes of help, particularly if the site involved is in an urban area where detailed surveys have been routine. However, the project site has been a cattle ranch until recently, and detailed data from old surveys are not available.

Based on our past experience in the analysis of bluff retreat in coastal areas of San Luis Obispo County and the characteristics of the bedrock section at the site, rates of bluff retreat should be in the range of <0.02 to 0.4 ft/yr. Higher rates cannot be totally ruled out, but there are no significant data that would suggest that abnormally high rates should be applied to the site. This range of rates of bluff retreat is distributed to the coastal bluffs at and adjacent to the site as shown on Figure 7 with one exception. The zones of relatively high shale and siltstone content located south of the existing raceway tanks and near the southeast corner of the study area are assigned a slightly higher rate of 0.5 ft/yr because of the low resistance of these units to erosion. These beds are only about 10-15 feet thick, so the period of more rapid erosion is not applicable to the entire 75-year projection interval.

The projected 75-year edge of bluff is shown on Figure 7 based on these estimated rates of retreat. This projection indicates that the project (proposed expansion area) will not be adversely affected by bluff retreat in the next 75 years. The seawater pond constructed at the Alexander Marine Research Laboratory ("Artificial fill" on map) and the existing Raceway Tanks may, however, be affected by future bluff retreat.

Effects of surface runoff on bluff erosion are addressed in the Drainage and Erosion section of this report.

d. Slope Stability

No evidence of past landslide conditions were observed at the site either in the bluff or on the slopes above the site. One small area of out-of-slope dip is present to the south of the westerly of the two existing raceways. This condition has been taken into account in assigning the rate of retreat in this area.

e. Seismic Considerations

No active or potentially active faults are known or suspected at or in the near vicinity of the site, and fault rupture hazards are insignificant.

Earthquakes generated by movement on major active faults in the region consist primarily of the expected magnitude 8.0-8.5 event on the San Andreas fault located approximately 43 miles to the northeast, and an event of considerable question on the Hosgri fault located approximately 5 miles offshore (PG&E, 1988). The maximum credible earthquake magnitude (Mw) for the Hosgri fault is approximately 7.2 (PG&E, 1988), but a much smaller magnitude is more likely. The expected large magnitude event on the San Andreas fault would likely generate maximum ground accelerations at the site in the range of 0.1g, and the questionable magnitude 7.2 event could generate ground accelerations of approximately 0.5g (Campbell, 1981). Lesser events are more likely, but a magnitude 6.0-6.5 earthquake on this fault would still generate accelerations up to approximately 0.3g.

2. Project Impacts

a. Bluff Retreat

Estimated rates of bluff retreat based on geologic characteristics of the bluff and experience in other parts of San Luis Obispo County indicate that the project (proposed expansion area) will not be adversely affected by bluff retreat in the next 75 years. The seawater pond constructed at the Alexander Marine Research Laboratory ("Artificial fill" on Figure 7) and

Figure 7
RATES OF BLUFF RETREAT
Abslons Form

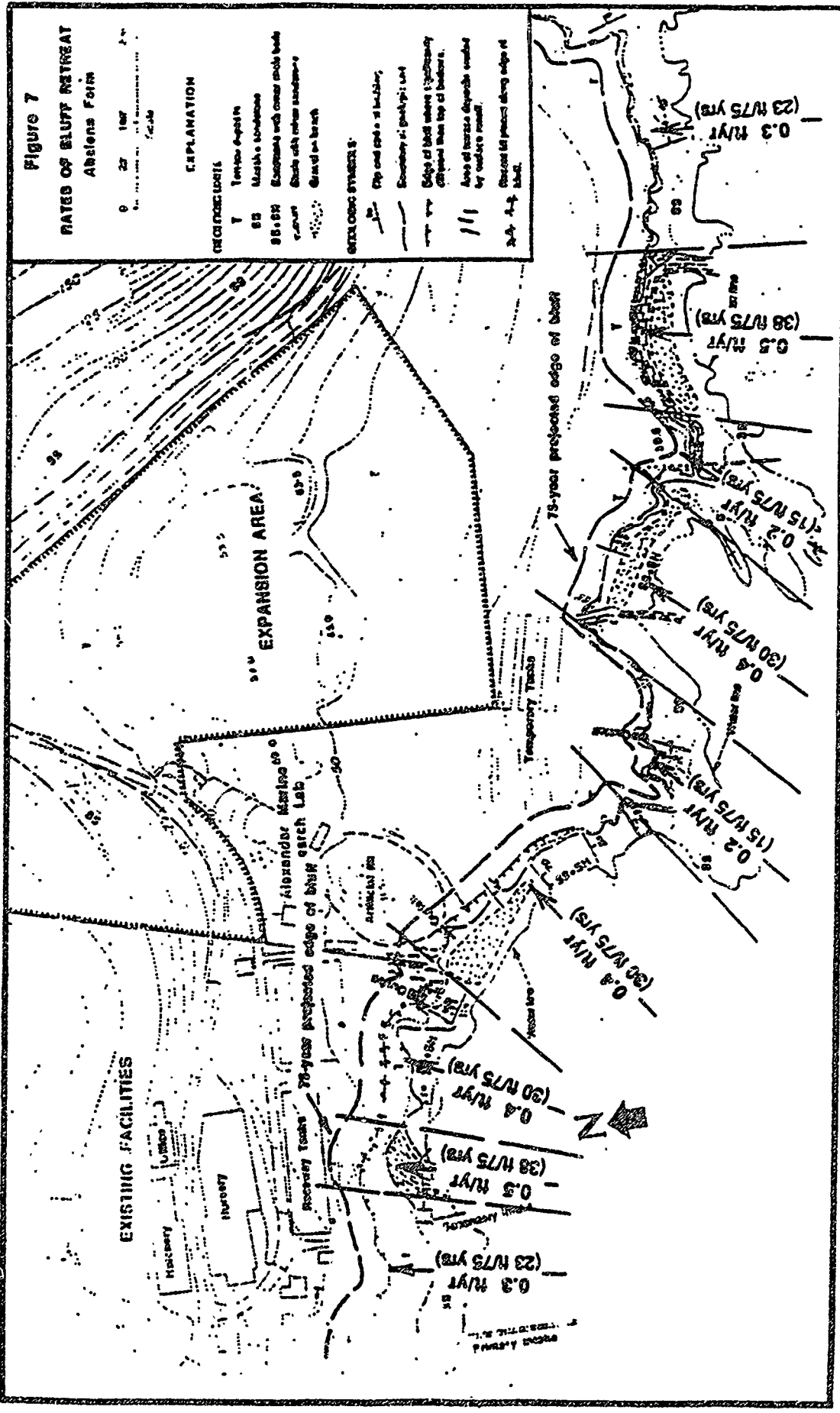
0 27 187
 1 27 187
 2 27 187
 3 27 187
 4 27 187
 5 27 187
 6 27 187
 7 27 187
 8 27 187
 9 27 187
 10 27 187
 11 27 187
 12 27 187
 13 27 187
 14 27 187
 15 27 187
 16 27 187
 17 27 187
 18 27 187
 19 27 187
 20 27 187
 21 27 187
 22 27 187
 23 27 187
 24 27 187
 25 27 187
 26 27 187
 27 27 187
 28 27 187
 29 27 187
 30 27 187
 31 27 187
 32 27 187
 33 27 187
 34 27 187
 35 27 187
 36 27 187
 37 27 187
 38 27 187
 39 27 187
 40 27 187
 41 27 187
 42 27 187
 43 27 187
 44 27 187
 45 27 187
 46 27 187
 47 27 187
 48 27 187
 49 27 187
 50 27 187
 51 27 187
 52 27 187
 53 27 187
 54 27 187
 55 27 187
 56 27 187
 57 27 187
 58 27 187
 59 27 187
 60 27 187
 61 27 187
 62 27 187
 63 27 187
 64 27 187
 65 27 187
 66 27 187
 67 27 187
 68 27 187
 69 27 187
 70 27 187
 71 27 187
 72 27 187
 73 27 187
 74 27 187
 75 27 187
 76 27 187
 77 27 187
 78 27 187
 79 27 187
 80 27 187
 81 27 187
 82 27 187
 83 27 187
 84 27 187
 85 27 187
 86 27 187
 87 27 187
 88 27 187
 89 27 187
 90 27 187
 91 27 187
 92 27 187
 93 27 187
 94 27 187
 95 27 187
 96 27 187
 97 27 187
 98 27 187
 99 27 187
 100 27 187

EXPLANATION

DETERMINED DATA

OTHER DATA

SYMBOLS



the existing Raceway Tanks, however, may be affected by future bluff retreat. These facilities can be removed at such time as bluff retreat becomes a problem as the value of these facilities would not warrant preventive measures.

b. Slope Stability

No slope stability problems have been identified at the site and no impacts resulting from this hazard are expected.

c. Seismic Considerations

The expected large magnitude earthquake on the San Andreas fault 43 miles to the northeast will result in relatively minor groundshaking at the project site, and no significant impacts to the proposed project are expected. Some minor damage to existing structures should be expected, and there may be sloshing of water out of the tanks in the nursery and raceway facilities. These effects should not be significant.

Occurrence of a large (magnitude 6.0-6.5) or major (magnitude 7) earthquake on the Hosgri fault located about 5 miles offshore could cause significant damage to the existing and proposed facilities. However, the actual occurrence of such an event during the life of the project is unlikely, and damage that may occur is not expected to result in significant secondary effects.

3. Mitigation Measures

No significant adverse impacts related to geologic hazards have been identified at the site and no mitigation measures are required.

B. DRAINAGE AND EROSION

1. Existing Conditions

a. Project Site

1) Surface Runoff

During the course of the site investigation (Appendix A), it was noted that there has been considerable erosion of the terrace deposits near the edge of the bluff in the area between the outfalls for the existing facilities and the Alexander Marine Research Laboratory. This erosion appears to be the result of surface runoff and/or spill of saltwater from the existing facilities, and additional areas of erosion may have been present at the bluff south of the Raceway Tanks prior to the recent placing of fill in this area.

Increased runoff should be expected as a result of the increased area of impervious surfaces (structures) and the reduced permeability resulting from compaction along the dirt and gravel roads. The arrangement of roads also would tend to intercept sheet flow and concentrate it near the area where the erosion has been identified (Figure 8). The open tanks catch some rainfall and discharge it to the outfall system along with the seawater. However, erosion appears to have been a significant problem at the existing facilities in the past, and erosion control will be important in the design of the expansion area.

2) Spills from the Saltwater Tanks

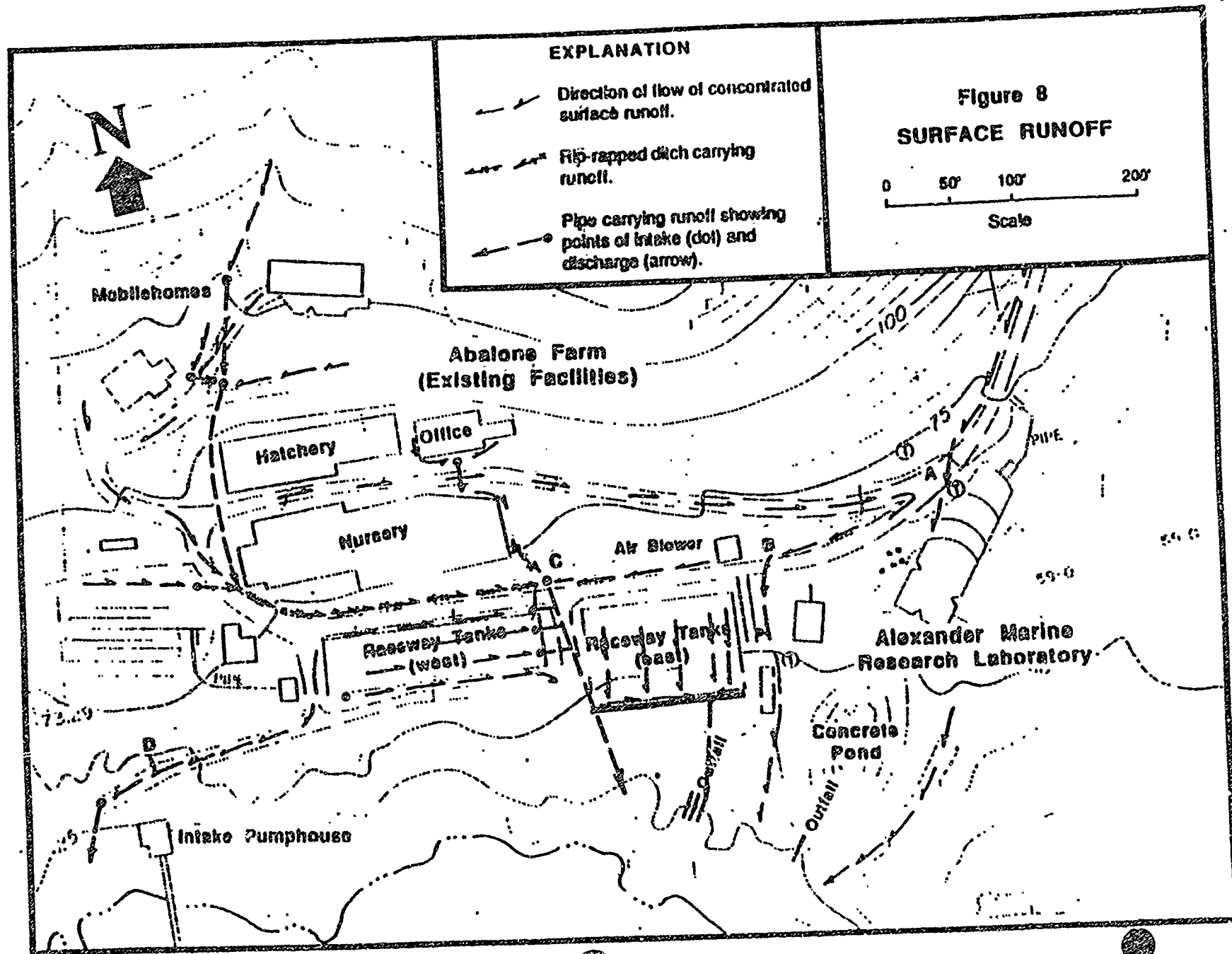
Discussions with Mr. Frank Oaks indicate that they have had problems in the past with plugging of the discharge with resulting overflow from the tanks. This has occurred for various reasons including abalone escaping to the discharge piping and growing to a size that plugs the pipe. As a result, they have been continually modifying the discharge system to utilize more open concrete drains that can be easily cleaned and limit the use of pipe to short sections where open drains are not feasible. This has substantially reduced plugging.

3) Erosion at the Outfalls

Erosion of the bluff resulting from discharge from the outfall pipes at the site does not appear to be a significant problem. The outfall from the existing facility discharges directly to a gravel or rocky beach (Figure 4 top left), and erosion is insignificant. The outfall from the Temporary Tanks (Figure 4, top right) discharges onto rock in an area of highly resistant sandstone, and present and future erosion is probably insignificant.

4) Seepage at the Bluff

In addition to erosion from surface runoff, there is a zone of extensive seepage in the bluff seaward from the large concrete pond at the Alexander Marine Research Lab ("artificial fill" on the geologic map). This seepage apparently comes from water leaking from the pond and migrating laterally along the top of the bedrock surface (base of the more permeable terrace deposits) to the face of the bluff where it contributes to the otherwise natural erosion of the bluff.



ORIENTED AND
CORRECTED

2007

106

b. Access Route

The access route to the existing facilities and the proposed expansion cross an area identified as a "wetland" and an Environmentally Sensitive Habitat on the Combining Designations Map 2 for the Estero Planning Area in the Coastal Zone Land Use Element. While no new development is proposed in or adjacent to this "wetland", potential damage from erosion along the access route and sedimentation in the "wetland" is a concern.

The extent of the identified "wetland" as interpreted by the EIR consultant is shown on Figure 9 along with the drainage characteristics of the area along the access road and the project site. It should be noted that no studies have been conducted on the "wetland" as a part of the preparation of this Expanded Initial Study, and the boundary shown is the consultant's interpretation of the extent of that habitat based primarily on topography. Points to note include:

- The existing facilities and the expansion area are separated from the "wetland" by a primary drainage divide, and no runoff from these facilities enters the "wetland".
- Runoff from the slopes above the access road is primarily by sheet flow to the road where it is concentrated in ditches along the upslope side of the road. The concentrated runoff flows to the nearest gully where it enters the "wetland".
- Examination of the ditches along the road indicates that erosion is insignificant due primarily to the presence of hard, resistant sandstone at the surface in the road cuts.
- Examination of the gullies where the concentrated runoff enters the "wetland" indicates that sedimentation is also insignificant. This is also apparent from the detailed topographic map (Figure 9) which shows no indication of the accumulation of sediment (i.e., small alluvial fans) at the ends of the ditches.

Based on these observations, erosion along the access road and downslope sedimentation in or adjacent to the "wetland" has been insignificant. Geologic conditions along the ditches are such that this condition should continue.

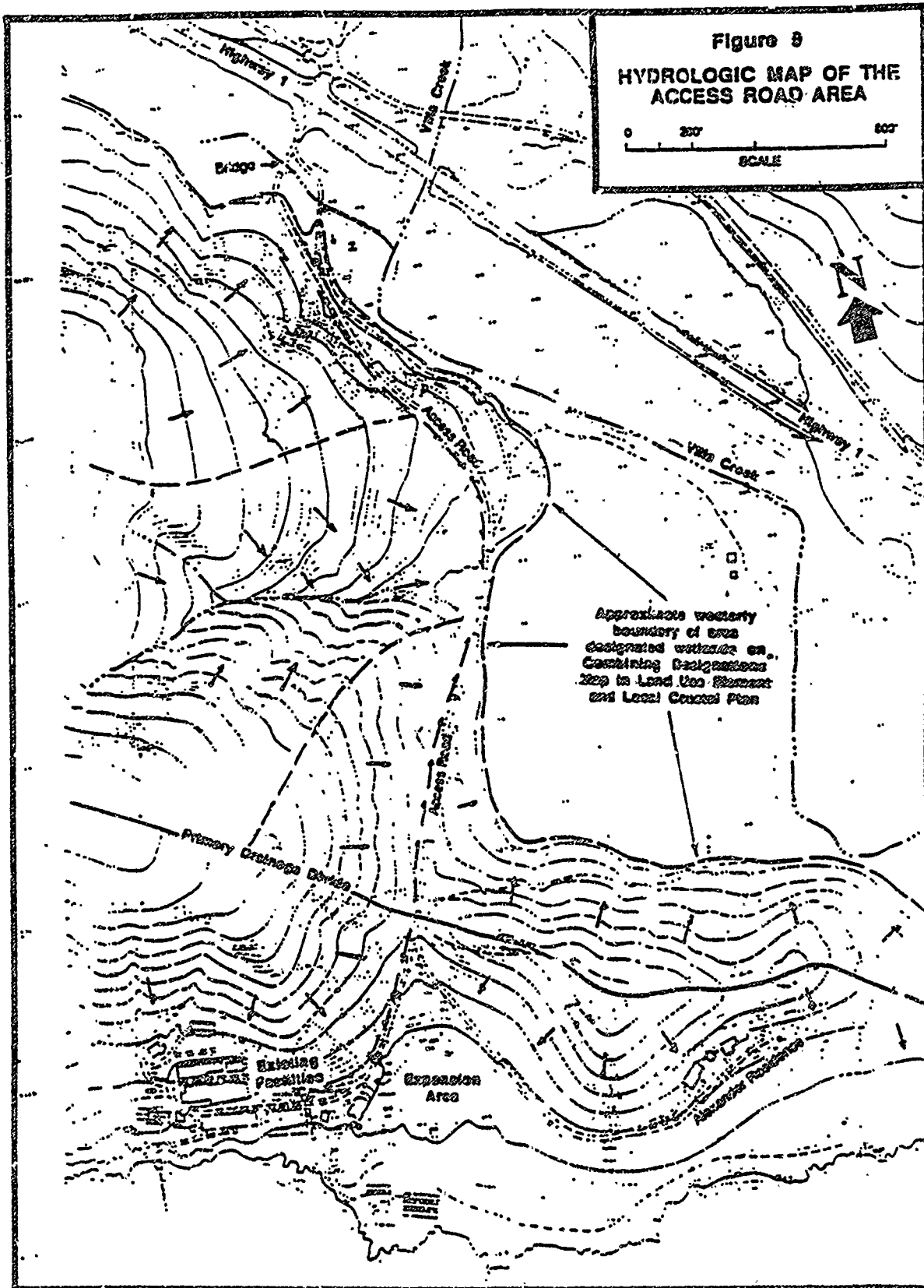
2. Project Impacts

a. Project Site

Runoff has been increased and concentrated in the area of the existing facilities, and erosion of the terrace deposits at the top of the bluff has been significant in some areas. The proposed facilities will also concentrate runoff, and measures should be taken to collect and convey this runoff over the bluff in a way that minimizes erosion.

Control of runoff concentrated on the steep access road to the intake pumphouse will also be important. This runoff is now collected in an open 8-inch pipe near the end of the road and discharged onto bedrock near the base of the bluff. The primary problem with this facility is that the terrace deposits erode easily, and the sediment in the runoff may plug this pipe in a heavy storm.

Spills of seawater from the raceway tanks has been reduced by utilizing open concrete drains to the greatest extent feasible. However, future plugging of the discharge system



cannot be precluded and precautions should be taken to catch spilled seawater before it reaches the edge of the bluff.

The loose fill at the edge of the bluff southerly of the existing raceway tanks is susceptible to erosion, and should be planted as soon feasible (i.e., at the onset of the wet season).

The seepage of water leaking from the large pond at the Alexander Marine Research Lab is also contributing to erosion of the bluff. It is also possible that this seepage could develop into piping with a major washout of the terrace deposits and the overlying embankment on the seaward side of the pond. The process would be much the same as the failure of the Baldwin Hills Reservoir, but on a much smaller scale.

b. Access Road

Examination of conditions along the access road indicates that erosion and downslope sedimentation have been insignificant, and geologic conditions indicate that this condition should continue with implementation of the proposed expansion.

3. Mitigation Measures

Potential impacts resulting from erosion by concentrated runoff or spills of seawater from the raceway tanks can be avoided or minimized by implementing the following mitigation measures:

General Recommendations:

- Concentrated runoff from the site shall not be allowed to flow over the coastal bluff, but shall be intercepted before reaching the bluff and diverted to control devices.
- All areas of recent fill along the edge of the bluff shall be planted to fast-growing grasses at the onset of the wet season to minimize first-year erosion. Native, salt-tolerant vegetation should be introduced as rapidly as feasible for long-term stability. A list of species is included on page 6 of Appendix B.
- Facilities to discharge collected runoff and seawater from the tanks on the site shall be constructed so that the released water does not impact on the terrace deposits, but is released onto bedrock or the gravel beach. For most locations at the site, piping should extend down the bluff to an elevation of approximately 20 feet above mean sea level.
- Discharge facilities should be constructed so that they can be periodically modified to accommodate changing bluff configurations. The large diameter PVC pipe now in use would appear to be ideal for this purpose.

Specific Recommendations for the Existing Abalone Farm Facilities:

- Drainage control shall be improved at Points A and B (Figure 8), north of the Alexander Marine Research Laboratory, so that concentrated runoff is conveyed westerly along the access road to the primary collection point C rather than crossing the road and flowing to the bluff along uncontrolled channels.

- An open concrete "V" ditch, similar to that along the southerly edge of the east raceway tanks, shall be installed southerly from the west raceway tanks. This ditch could be located in the center or along the southerly edge of this access road. The ditch shall be designed to carry the total seawater flow to these tanks in the event of a spill, or runoff from the local area for a 100-year storm, whichever is greater. The area between this access road and the bluff (now loose fill) shall be graded to direct surface flow back to the "V" ditch to the extent that this is feasible.
- Drainage facilities along the road to the intake pumphouse should be revised as follows:
 - The intake to the pipe at the bottom of the road shall be improved to include a concrete box configured to minimize sediment clogging (i.e., edges raised above road level but below the level of the berm at the south edge of the road).
 - Concentrated runoff from above the steep segment of this road (easterly of Point D on Figure 8) shall be intercepted and conveyed to the box inlet at the bottom of the road by a pipe buried in the roadway. (This improvement is intended to minimize runoff flowing down the steep segment of the road and consequent erosion and sedimentation at the box inlet.)
 - Runoff from the steep segment of the road shall be channeled in a non-erosive device located in the center of the road or on the inland side of the road, and conveyed to the box inlet at the bottom end of the road.
 - Discharge from the pipe from the box inlet shall be onto bedrock and not onto the softer terrace deposits (i.e., at or below elevation approximately 20 feet).

Specific Recommendations for the Abalone Farm Expansion Facilities:

- Control of excess surface runoff or a spill of seawater from the expansion facilities shall be controlled by providing an open concrete ditch along the southerly perimeter of the facility.
- Diversion and control of runoff flowing toward the expansion facility shall be governed by the General Recommendations above.

Specific Recommendations for the Alexander Marine Research Laboratory:

- Leakage from the concrete pond shall be stopped or reduced to a level of insignificance, or the use of this facility shall be terminated. Seepage at the bluff is substantial, and piping, with a major increase in the volume of flow and the possible collapse of the terrace underlying the seaward side of the pond, could develop at any time. The result could be a major scar on the coastal bluff.
- If use of this facility is to be terminated, then it shall be removed and the site returned to its original configuration to the extent that this is feasible.

- The drainage course along the southeasterly side of the concrete pond shall be improved to conform to the General Recommendations listed above.

C. BIOLOGICAL RESOURCES

1. Existing Conditions

a. Terrestrial Biology

A vegetation survey of the Abalone Farm property has been conducted by Drs. V. L. Holland and David Keil, and the report of their investigation is included as Appendix B. Terrestrial plant communities identified at the site include coastal valley grassland on the coastal terrace, coastal scrub on the hillsides above the coastal terrace, sea bluff coastal scrub on the headlands and the fringe of the coastal terrace, and communities of introduced weedy species (anthropogenic communities) in disturbed areas near the existing facilities. The individual species present in these communities are discussed in detail in Appendix B. No species listed by the state or federal governments as endangered, threatened or as a candidate species, or species listed by the California Native Plant Society as rare and/or endangered were identified on the site.

b. Marine Biology

A survey of the marine environment at the site has been conducted by Dr. Fred L. Clogston, marine biologist, and the report of this investigation is attached as Appendix C. This report describes the intertidal and near-shore habitats and their biota.

2. Project Impacts

a. Terrestrial Biology

Implementation of the proposed project will result in the destruction of the vegetation on the marine terrace within the area of the proposed expansion. This area includes no known "rare and endangered species" and is not in conflict with Section 23.07.176, Terrestrial Habitat Protection in Sensitive Resource Areas. Impacts due to loss of coastal grasslands are, therefore, insignificant.

The terrestrial biological report also identifies erosional problems at the site. These are addressed above in the Drainage and Erosion section, and mitigation measures are required.

b. Marine Biology

The marine biological investigation did not identify any areas of existing or potentially significant impacts on the marine environment as described in Section 23.07.178 of the CZLUO. The report also notes that erosion of the coastal bluff has occurred in the past, but that the system to control runoff and spills from the tanks now in use and proposed for

the expansion area should minimize additional effects. Excessive erosion of the bluff and the introduction of silt into the marine environment may be deleterious in the short-term. However, affected areas normally recover quickly, and the effect is adverse but not significant.

All reasonable means should be taken, however, to minimize erosion of the bluff, and measures to minimize future erosion are included in the drainage and erosion section of this Expanded Initial Study.

3. Mitigation Measures

No significant impacts to biological resources have been identified, and no mitigation measures are required. Use of native vegetation in the control of erosion is included in the mitigation measures in the Drainage and Erosion section.

D. ARCHAEOLOGICAL RESOURCES

1. Existing Conditions

Archaeological surveys of the expansion area have been conducted by Mr. Robert O. Gibson (June 18, 1988) and Mr. W. B. Sawyer (August 25, 1988). Gibson's investigation consisted of a record search and surface investigation, and Sawyer's investigation included subsurface testing recommended by Gibson. The subsurface investigation indicated that the site identified by Gibson is smaller than suggested by the surface examination, and that the site does not extend southerly of the cut bank at the northerly edge of the area partially graded for expanding the raceway tanks.

2. Project Impacts

The subsurface investigation indicates that grading south of the cut bank at the northerly edge of the area graded for expanding the raceway tanks will not impact archaeological resources, and monitoring of grading in this area is not required. However, archaeological remains may be present in the subsurface north of the cut bank, and grading in this area should be monitored.

3. Mitigation Measures

Additional grading north of the cutbank in the expansion area (i.e., more than 20 feet north of elevation point 58.0 on Figure 2) shall be monitored by an archaeological team, including a Native American, to collect any archaeological materials that may be encountered.

E. VISUAL CONSIDERATIONS

1. Existing Conditions

The site is visible to northbound travelers along a relatively short section of Highway 1 extending from approximately Cayucos Point northwesterly for approximately 3/4 mile (Figure 10). Along this segment of the highway, the distance to the site varies from approximately 1.5 miles to 3/4 mile.

The visibility of the site from Highway 1 is illustrated by the photographs on Figure 11. View A is from the easterly edge of the site back toward Highway 1 (Figure 10). The highway is visible as a faint alignment of tonal differences, and three large RV's are distinguishable as white dots. View B on Figure 11 is from the nearest point along Highway 1 from which most of the existing facilities are visible. In this view, the Alexander residence is moderately prominent. The Abalone Farm is moderately visible, and the only structures that can be identified are the nursery buildings.

The maximum possible view of the site is from Point C on Figure 10. This point on the highway affords the maximum potential to "see around" the view-blocking ridge just west of the Alexander residence. The azimuth of the view from this point is approximately 281°. Figure 12, Relative Visibility, has been prepared using this viewing angle aligned across the view-blocking ridge on the easterly side of the site and also across the ridge above the access road to the existing facilities. Areas defined are: 1) those that are visible from Point C on Highway 1; 2) those that are not visible; and 3), those areas within which structures 10 feet high would not be visible. The temporary mounds left from the partial grading of the site are ignored in this analysis.

2. Project Impacts

Based on the visibility of the expansion area as shown on Figure 12 and the height of the raceway tanks of approximately 4 feet, the proposed project will not be visible from Highway 1. The existing facilities, however, are moderately visible, and the nursery buildings can be identified from the highway. This visual effect is adverse, but not significant in that the visible structures are not significantly different from agricultural structures that are more prominently visible from Highway 1.

3. Mitigation Measures

No significant visual impacts have been identified, and no mitigation measures are required by CEQA. However, the site is within a Sensitive Resource Area under the Local Coastal Plan, and the intent of the standards relating to this Area is to minimize all adverse visual effects. As a result, screens of cypress along the easterly boundary and in front of the nursery buildings (Figure 12) have been included in the landscaping plan for the project. These trees have been planted (bottom of top photo on Figure 11), and a drip irrigation system installed. These trees will provide screening of the project in the future.

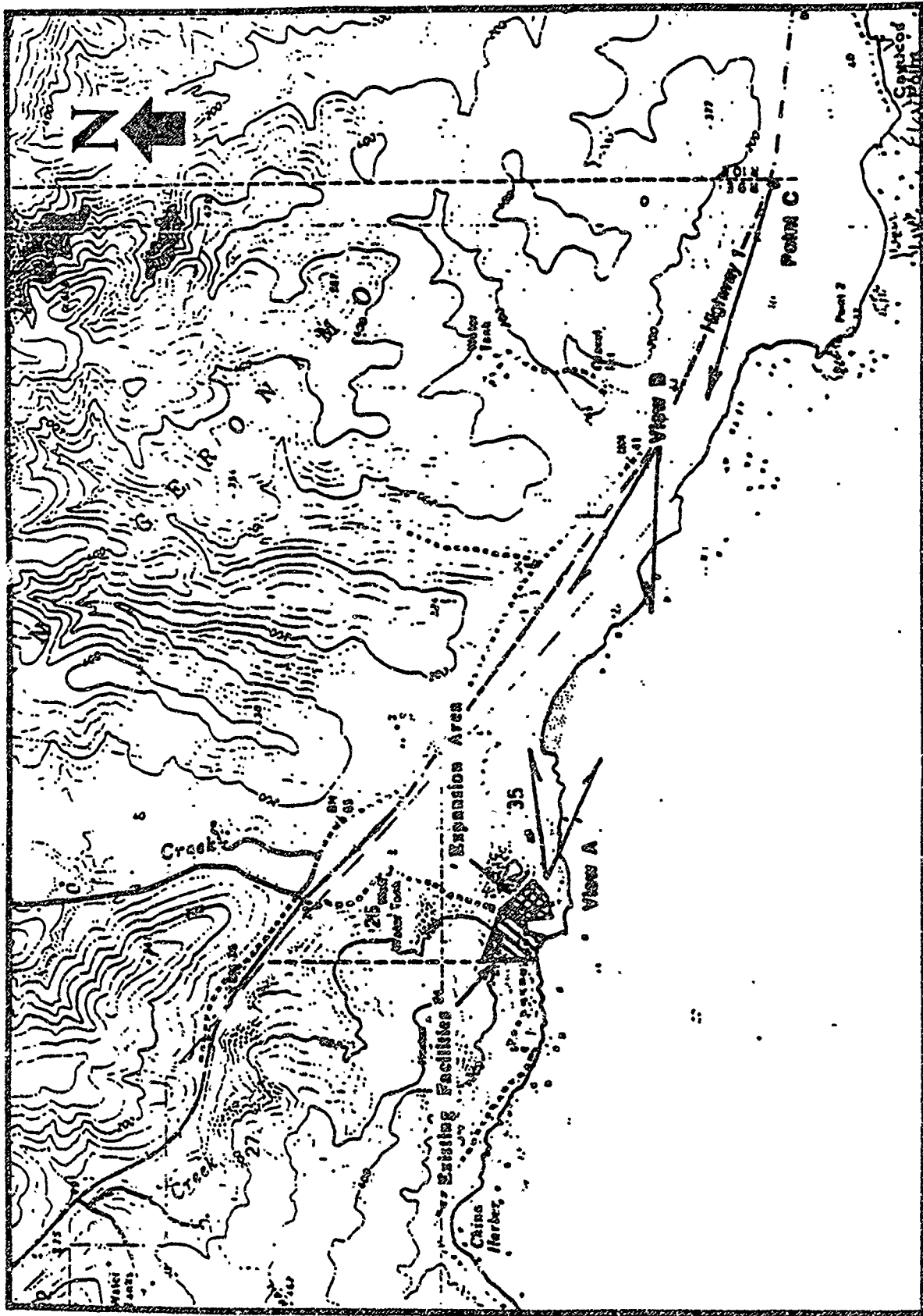


Figure 10. Index to Views from/to Highway 1. Base from USGS Cayucos Quadrangle, culture current to 1965. Scale: 1" = 2,000'

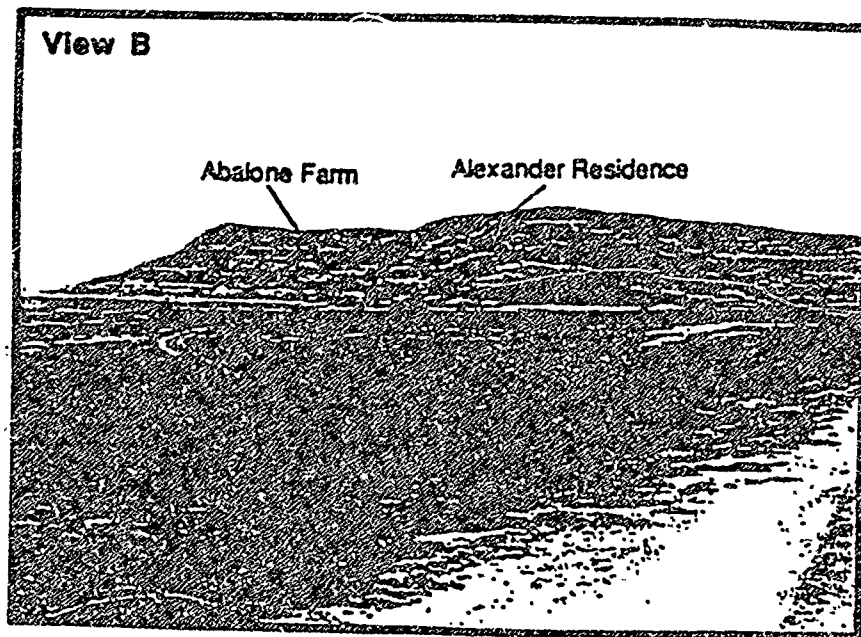
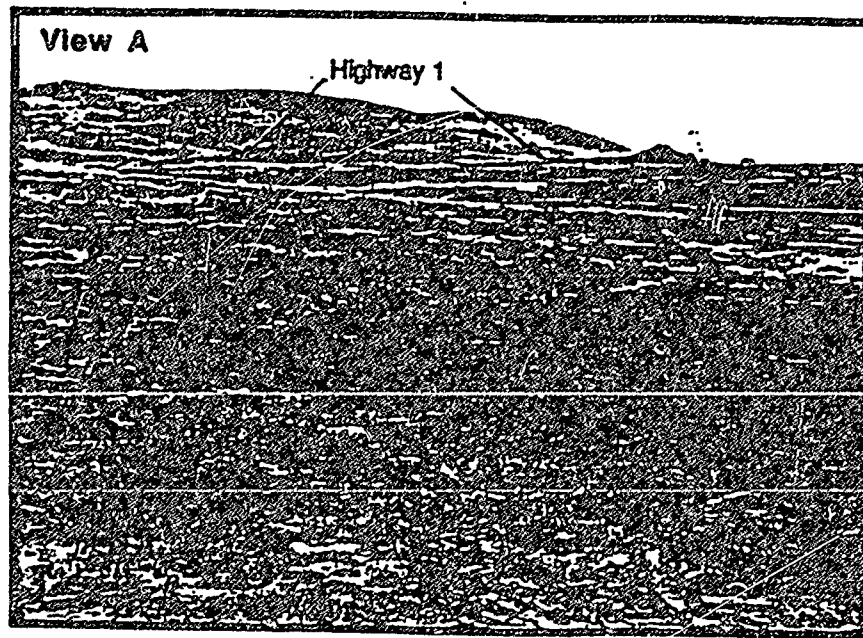
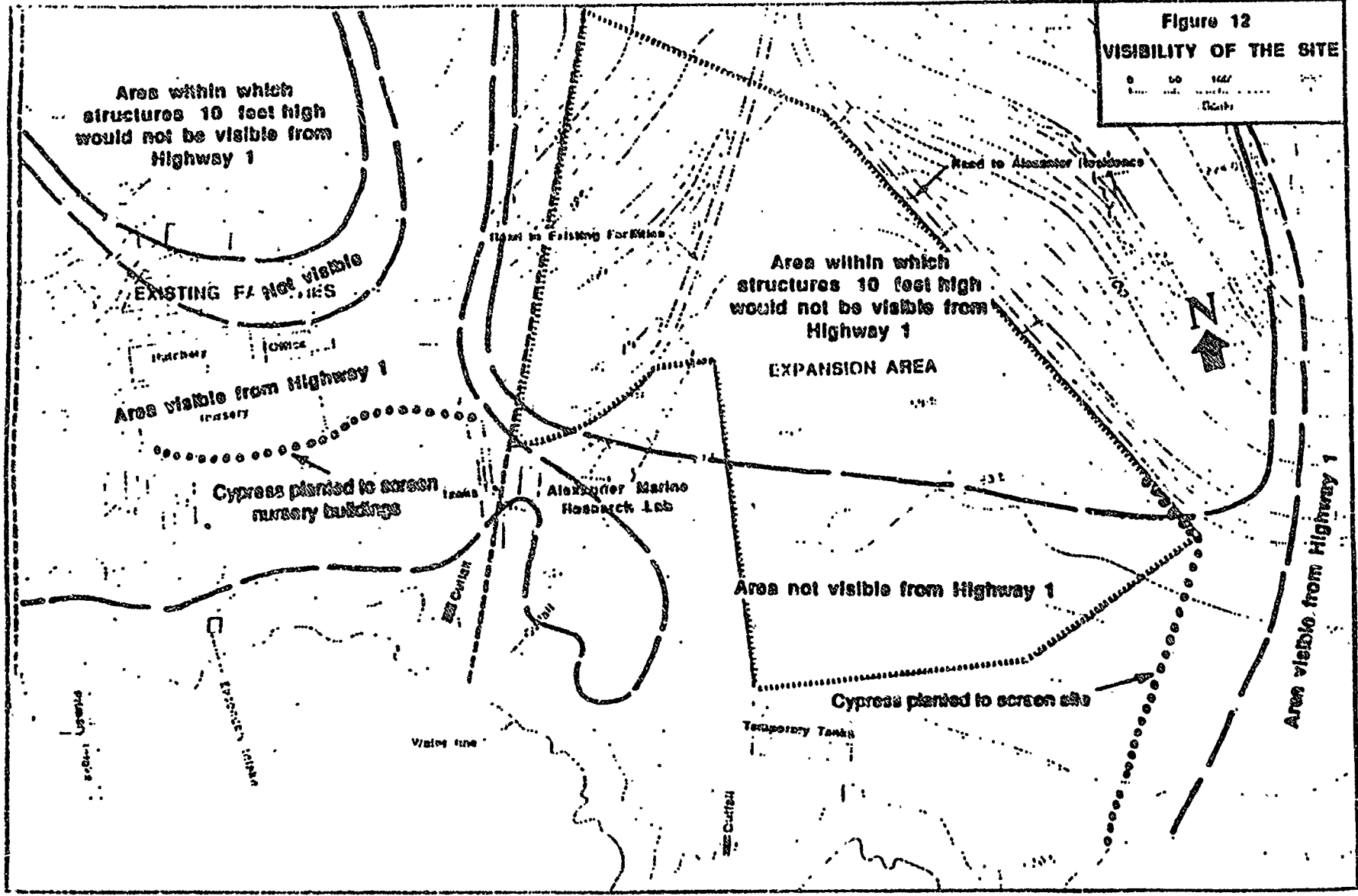


Figure 11. Views of the site from Highway 1 (bottom) and of Highway 1 from the site (top).

CREATED BY	115
DATE	2706

Figure 12
VISIBILITY OF THE SITE



33

OPTIONAL PAGE
PAGE 21016

F. TRAFFIC

1. Existing Conditions

The number of people presently employed at the site in any one day and that may generate traffic on Highway 1 varies considerably depending on the work load, the number of part-time people, students from Cal Poly working on senior projects, etc. However, based on a worst-case condition, the present peak-day employment at the Abalone Farm is estimated by the applicant to be approximately 25 persons.

2. Project Impacts

Implementation of the proposed project will increase worst-case, peak-day employment to approximately 31, or an increase of 6 employees. Assuming all the additional employees enter and leave the site during the morning and evening peak-hour traffic periods, peak-hour traffic would be increased by 6 trips. Peak-hour traffic along Highway 1 in the vicinity of Villa Creek is approximately 1,200 vehicles per hour, and the addition of 6 additional trips (0.5%) will be insignificant.

3. Mitigation Measures

No significant impacts to traffic have been identified, and no mitigation measures are required.

G. AIR QUALITY

1. Existing Conditions

a. Project Equipment

The existing facilities generate emissions primarily by the use of diesel powered pumps used during power outages. The characteristics of these pumps are as follows (Frank Oaks):

Use of Pump	Horsepower
Primary seawater intake	125
Circulation	25
Air blower	30

The primary seawater intake pump is critical if the abalone are to survive through a power outage, and this pump is tested for approximately 2 hours each week. The remaining pumps are not critical, and these are not tested on a regular basis. The average annual use of the primary seawater pump is approximately 8 periods of 4-hours each per year. The other pumps are not normally used unless the outage is expected to last for more than 4 hours. However, for worst-case conditions, existing emissions are estimated below assuming all back-up pumps are used during the outage. Existing emissions, based on EPA AP-42, 4th Edition (1985) Table 3.3-1 assuming a load factor during testing of the primary pump of 10% and load factors during use of 80%, are as follows:

Equipment	Total Emissions (tons/year)			
	HC	NO _x	SO _x	CO
Primary seawater intake:				
Testing	0.002	0.020	0.001	0.004
Operation	0.004	0.049	0.003	0.011
Circulation	0.001	0.010	0.001	0.002
Blower	0.001	0.012	0.001	0.003
Totals	0.008	0.091	0.006	0.020
Total for Planning Area	979.2	568.0	44.2	9,848.2
% of Planning Area Emissions	0.0008	0.02	0.01	0.0002

b. Mobile Emissions

Emissions from Highway 1 traffic constitute the following percentages of total emissions (1985 APCD Inventory) in the Estero Planning Area:

Pollutant	Percent of Total Emissions in the Estero Planning Area
Reactive Hydrocarbons	7.2%
Particulate Matter	0.6%
Oxides of Nitrogen	3.8%
Sulfur Oxides	8.2%
Carbon Monoxide	12.0%

2. Project Impacts

a. Project Equipment

Implementation of the proposed project will add one 75 horsepower air blower back-up diesel motor which will affect on-site emissions as follows:

Equipment	Total Emissions (tons/year)			
	HC	NOx	SOx	CO
Existing equipment	0.008	0.091	0.006	0.020
Additional blower	0.002	0.030	0.002	0.006
Totals	0.010	0.121	0.008	0.026
Total for Planning Area	979.2	568.0	44.2	9,848.2
% of Planning Area Emissions	0.0010	0.02	0.02	0.0003

Emissions from existing and proposed equipment at the site are clearly insignificant.

b. Mobile Emissions

The project will increase traffic on Highway 1 by 0.5% which will increase total emissions in the Estero Planning area as follows:

Pollutant	Percent of Total Emissions in the Estero Planning Area
Reactive Hydrocarbons	0.036%
Particulate Matter	0.003%
Oxides of Nitrogen	0.019%
Sulfur Oxides	0.041%
Carbon Monoxide	0.060%

Based on the above, potential impacts to air quality are insignificant.

3. Mitigation Measures

No significant impacts to air quality have been identified, and no mitigation measures are required.

REFERENCES

- Asquith, D. O., 1983, *Rates of Coastal Bluff Retreat, Pismo Beach, California: Coastal Zone '83*, p. 1195-1207.
- Campbell, K.W., 1981, *Near-source attenuation of peak horizontal ground acceleration: Bull. Seis. Soc. Amer.*, v. 71, p. 2039-2070.
- Ernstrom, D.J., 1984, *Soil Survey of San Luis Obispo County, California, Coastal Part: U.S. Department of Agriculture, Soil Conservation Service.*
- Hall, C. A., 1974, *Geologic Map of the Cambria Region, San Luis Obispo County, California: U.S. Geological Survey Map MF-599.*
- Kuhn, G. G., and F. P. Shepard, 1984, *Sea Cliffs, Beaches, and Coastal Valleys of San Diego County: Some Amazing Histories and Some Horrifying Implications: University of California Press*, 193 p.
- PG&E, 1988, *Final Report of the Diablo Canyon Long Term Seismic Program: prepared for the Nuclear Regulatory Commission, July 1988.*
- Sawyer, W. B., *Archaeological subsurface testing, the Abalone Farm extension, APN 046-151-009, Cayucos, California: prepared for the Abalone Farm, Inc. August 25, 1988.*

Appendix A
ENGINEERING GEOLOGIC REPORT

ORLENDA PAGE	121
INDEX PAGE	2712

THE MORRO GROUP

September 20, 1988

Office of the Environmental Coordinator
County of San Luis Obispo
County Government Center
San Luis Obispo, CA 93408

ATTN: Mr. John Nall

SUBJECT: Engineering Geologic Report for Bluff Retreat Setback, the Abalone Farm

Dear Mr. Nall:

The following engineering geologic report has been prepared to conform with the requirements of Section 23.04.118b of the Coastal Zone Land Use Ordinance. In this regard, it should be noted that the list of required information given in this ordinance is generic, and covers all items that may be of use in California. Some items are not available or of limited use in the evaluation of bluff retreat in this area, and our report concentrates on the information that is available.

A. EXISTING GEOLOGIC CONDITIONS

1. Geologic Units

The proposed project is located on the coastal terrace approximately 1/2 mile west of the mouth of Villa Creek and one mile west of Highway 1. This area has been mapped by Hall (1974) at a scale of 1"=2,000 (Figure 1), and the bedrock in the area is Cretaceous sandstone which is the dominant unit underlying the coastal bluffs from the area of the site north to the community of Cambria. This unit is composed primarily of medium grained, arkosic sandstone that is hard, resistant to erosion, and stable under most geologic conditions. However, thin beds of siltstone and claystone are present in some areas between the massive to thick bedded sandstones, and overall resistance to erosion is primarily related to the distribution of these weaker units.

The detailed geology of the bluff at the site is shown on Figure 2 at a scale of 1"=100'. The area covered (study area) extends easterly approximately 300 feet from the project (Expansion Area), and westerly to include all of the area of the existing facilities at the Abalone Farm and the Alexander Marine Research Laboratory. Geologic units distinguished include the terrace deposits (approximately 120,000 years old), and units of the Cretaceous sandstone (approximately 100 million years old) including massive sandstone (SS on map), sandstone with minor shale beds (SS+SH), and thicker units of shale and siltstones that can be mapped individually. The relative resistance to wave erosion of the Cretaceous sandstone decreases with increasing content of shale and siltstone.

The terrace deposits are composed of silty and clayey sands that are only partially consolidated and much more susceptible to erosion than the underlying bedrock. In the easterly half of the study area, the thickness of the terrace deposits at the edge of the bluff varies in the range of

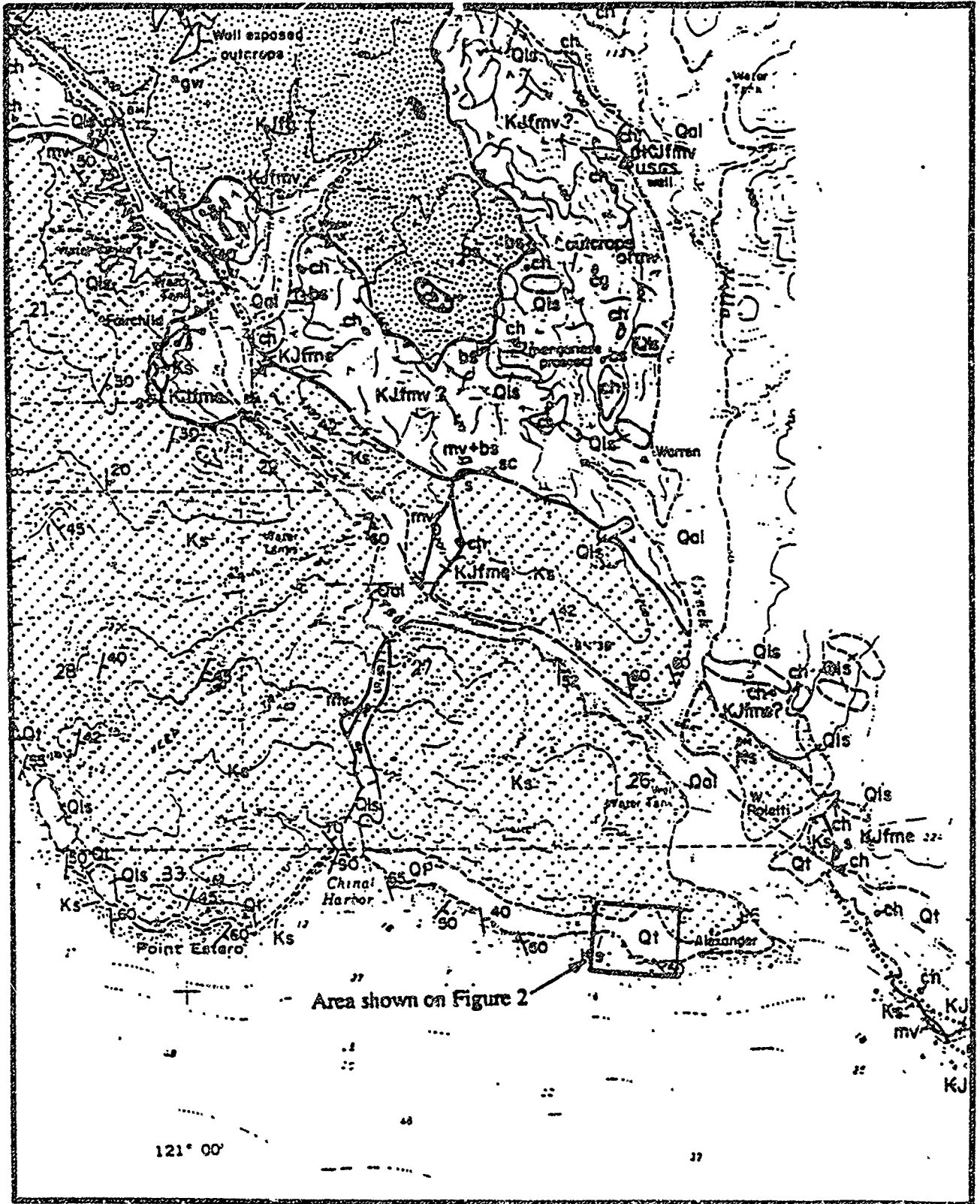
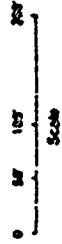


Figure 1. Geologic Index Map. From Hall, 1974. Scale: 1"=2,000'

A-2

Figure 3

GEOLOGIC MAP Abslone Farm



EXPLANATION

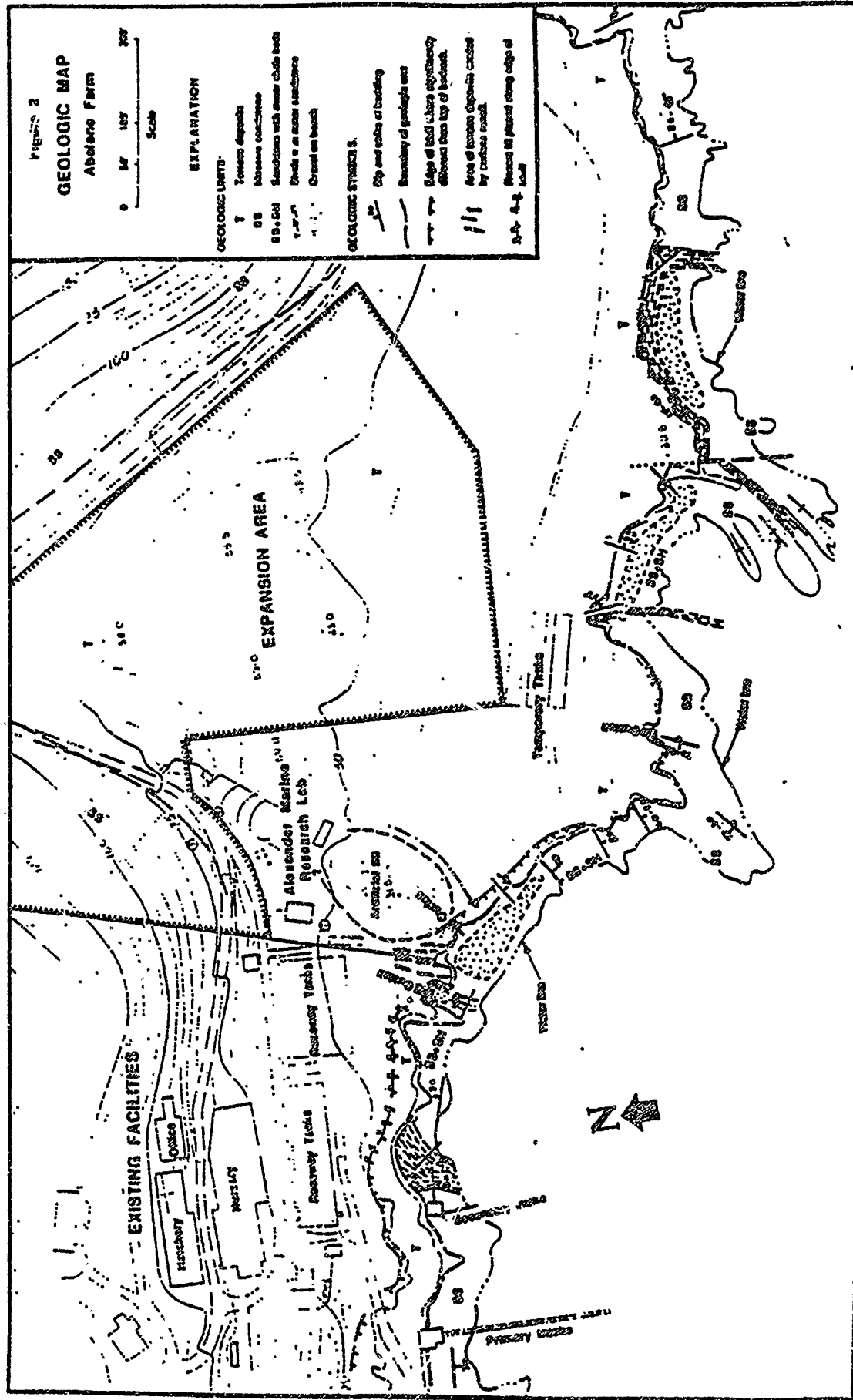
GEOLOGIC UNITS

- T Tertiary deposits
- BB Basal sandstone
- BB-100 Sandstone with massive chert beds
- C-C' Chert in mass tabular form
- C-C' Chert on beach

GEOLOGIC SYMBOLS

- City and town of building
- Boundary of polygon unit
- Edge of field where topography different from top of bedrock
- Area of known deposits covered by surface rough

3-A, 4-4, 1-4-1



ORDER NO.	124
PRICE PER	2715

approximately 3-5 feet, and the top of the bedrock is consistently at an elevation of approximately 20-25 feet. However, beginning at a point westerly of the Temporary Tanks, the thickness of terrace deposits increases northwesterly along the bluff at a rate equivalent to the increase in elevation of the top of the bluff. At a point west of the south edge of the Temporary Tanks, the terrace deposits are approximately 10 feet thick. Northwesterly, near the "Artificial fill" at the Alexander Marine Research Laboratory, the terrace deposits are approximately 15 feet thick. To the west, in the area above the primary and secondary intake structures, the terrace deposits are approximately 35-40 feet thick. In these areas where the terrace at the bluff is much thicker, the elevation of the top of the bedrock is at elevation 20-25 feet as it is to the east where the terrace deposits are much thinner. This distribution of the thickness of the terrace deposits can be related to long-term rates of bluff retreat that are discussed below.

2. Geologic Structure

The orientation of bedding planes in the Cretaceous sandstone sequence at the site is shown on Figure 2 using standard geologic symbols for the dip and strike of bedding. Bedding orientation is consistent with the alignments of physical features along the bluff and the rocks offshore. The bedrock in the area is highly fractured and jointed, but the alignments of these rock features do not appear to control to any significant extent variations in the rates of retreat of the bluff. That the bedrock is fractured contributes to its erodability. However, fracture and joint patterns are not significantly affecting the locations of retreat, and the orientations of these features are not shown on the geologic map.

3. Bluff Retreat

a. General Considerations

1) Statewide Conditions

Criteria for the evaluation of coastal bluff retreat as contained in the LCP-LUO include a generic list of all possible methodologies that might be used to effectively solve the questions involved. The list is oriented toward areas of very high rates of retreat such as have been experienced in parts of Los Angeles and San Diego County. These methodologies do not necessarily apply to San Luis Obispo County. For example, Drs. Kuhn and Shepard (1984) of the University of California have compiled a "horror story" of examples of coastal bluff retreat in San Diego County. On the other hand, they include in their discussion of Methods of Study (p. 8-9) two pictures of a sea cliff north of Port San Luis in San Luis Obispo County that, between 1898 and 1945, experienced essentially no observable change (see Attachment A). The primary points to be noted are that local geologic conditions control rates of retreat, and that methodologies to evaluate rates of retreat that are applicable in one area may not be applicable in other areas.

2) Local Conditions

Coastal bluffs on the Central Coast normally include a lower section composed of bedrock with a relatively high but variable degree of resistance to wave erosion, and an upper section composed of terrace deposits that have a relatively low degree of resistance to wave erosion. Where bedrock extends significantly (i.e., 10-15 feet or more) above the zone of effective wave attack (i.e., above the shore-line angle), bluff retreat is controlled almost totally by the characteristics of the bedrock units. However, where the bedrock is low in the coastal bluff (less than 5 feet), erosion at the edge of the bluff is controlled primarily by the resistance of the overlying terrace deposits, and the degree to which the beach seaward of the bluff is erodible. This condition is relatively limited on

the Central Coast, but where it is present relatively high rates of retreat are common. Examples include the bluff in north Morro Bay and southern Cayucos, Pismo Beach near the pier, and Montana de Oro just north of the mouth of Hazard Canyon where 30-50 feet of bluff was lost in the 1983 storms alone.

At the project site, bedrock is high in the bluff (20-25 feet), and retreat from wave erosion is controlled primarily by the resistance of the bedrock units. Also, the wave-cut platform is shallow for several hundred feet offshore, and numerous rocks are exposed at mid- to low-tide for distances of 300 to 400 feet offshore. This condition extends offshore for at least 1/2 mile as shown by the seaward protrusion of the depth contours on Figure 1 and the presence of kelp beds offshore. There are gravel deposits on some of the beaches along the bluff at the site. However, these are thin (a foot or so), and the sea bottom offshore can be considered as being bedrock and not easily erodible.

b. Absolute Rates of Retreat

Absolute rates of the retreat of coastal bluffs can be determined from historical evidence such as photographs (aerial or ground locations) of the same area taken at different times, or survey maps of the bluff edge or survey points that have been referenced to the bluff edge. This type of evidence is normally available for areas urbanized several tens of years ago (i.e., Los Angeles-San Diego region), but it is not generally available for rural regions which include most of San Luis Obispo County. Exceptions include the Dinosaur Caves-Shelter Cove area of Pismo Beach where large-scale Caltrans aerial photographs were utilized to establish rates of retreat over the last 30 years (Asquith, 1983), the South Palisades area of Pismo Beach where a pipeline near the bluff provides a long-term line of reference, and the Pirate's Cove area of Avila Beach where near-bluff physiographic features have not been significantly altered and where rates of retreat are locally high.

These studies establish absolute rates of retreat for the Central Coast generally as follows:

<u>Geologic Condition</u>	<u>Average Rate of Retreat (ft/yr)</u>
Hard, resistant rocks (e.g., Obispo tuffs and older hard rocks)	<0.2
Medium resistant rocks (e.g., Miocene shales and siltstones)	0.2-0.4
Low resistant rocks (e.g., folded and fractures shales and siltstones)	0.4-0.8
Very low resistant rocks (e.g., landslide debris)	1.0-2.0 or higher

It should be emphasized that these rates of retreat are based on studies conducted to date, and additional studies may result in some modification of these parameters. Also, identification of the conditions involved requires local experience, and this author does not assume responsibility for the use of these parameters by others. However, there would appear to be a limitation on the range of bluff retreat rates in which bluffs underlain by a thick section 10 feet or more) of very resistant rock show no discernible rate of retreat (<0.2 ft/yr as a threshold value), and some easily erodible sections have rates of retreat averaging up to 2 ft/yr or more.

Bluffs having thin (<5 feet) or no rock section as in Cayucos may have rates of retreat that are substantially greater than those listed above. Rates of retreat in these areas tend to be highly dependent on the stability of the sand beach fronting the bluff, and methods of evaluating sand

beach stability are problematic at best.

c. Absolute Rates at the Site

Aerial photographs available in the County files and past surveys of the site have been reviewed, and no information has been identified that would further refine local rates of bluff retreat beyond those that can be assigned on a general basis. That is, available aerial photographs are at scales in the range of 1,000-2,000 ft/in, and threshold measurements of approximately 0.02 inches equate to distances of 20 to 40 feet, or the retreat that would be expected with the normal range of conditions in 50 to 100 years. These photographs, therefore do not provide useful information unless rates of retreat are substantially above normal levels.

Land surveys are sometimes of help, particularly if the site involved is in an urban area where detailed surveys have been routine. However, the project site has been a cattle ranch until recently, and detailed data from old surveys are not available.

d. Relative Rates of Retreat

Absent reliable data from which to extract absolute rates of bluff retreat for the site, this study relies on a comparison of the geologic conditions at the site with those investigated by the author where data for absolute rates of retreat are more reliable. Two basic approaches are involved:

Short-Term (a few hundred years): Rates of retreat in this time-frame can be estimated from rock characteristics and their relationship to the present characteristics of the shoreline. Given the generally resistant nature of the bedrock sandstone section at the site and the height of bedrock above the beach, rates of retreat that should be expected are in the range of <0.2 to 0.4 ft/yr at most.

Long-Term (several thousands of years): Long-term rates can be estimated from the degree of encroachment into the typical terrace section. That is, assuming that the Cayucos terrace surface, developed after a past high-stand of sea level approximately 120,000 years ago, was relatively intact at the onset of the present high-stand of sea level beginning approximately 5,000 years ago, the rate of retreat is approximately proportional to the height of the bluff (and the thickness of terrace deposits exposed in that section).

Of the above, the short-term rate of retreat (a few hundred years) is probably the only parameter of interest in the analysis of bluff retreat applicable to the proposed project. However, the long-term history of the site is of interest in that it can provide a check on the rates of retreat that have been assigned for the short term.

1) Short-Term Rates of Retreat

Based on our past experience in the analysis of bluff retreat in coastal areas of San Luis Obispo County and the characteristics of the bedrock section at the site, rates of bluff retreat should be in the range of <0.02 to 0.4 ft/yr. Higher rates cannot be totally ruled out, but there are no significant data that would suggest that abnormally high rates should be applied to the site. This range of rates of bluff retreat is distributed to the coastal bluffs at and adjacent to the site as shown on Figure 3 with one exception. The zones of relatively high shale and siltstone content located south of the existing raceway tanks and near the southeast corner of the study area are assigned a slightly higher

Figure 3

RATES OF BLUFF RETREAT
Abalona Fsim

0 50' 100' 200'

EXPLANATION

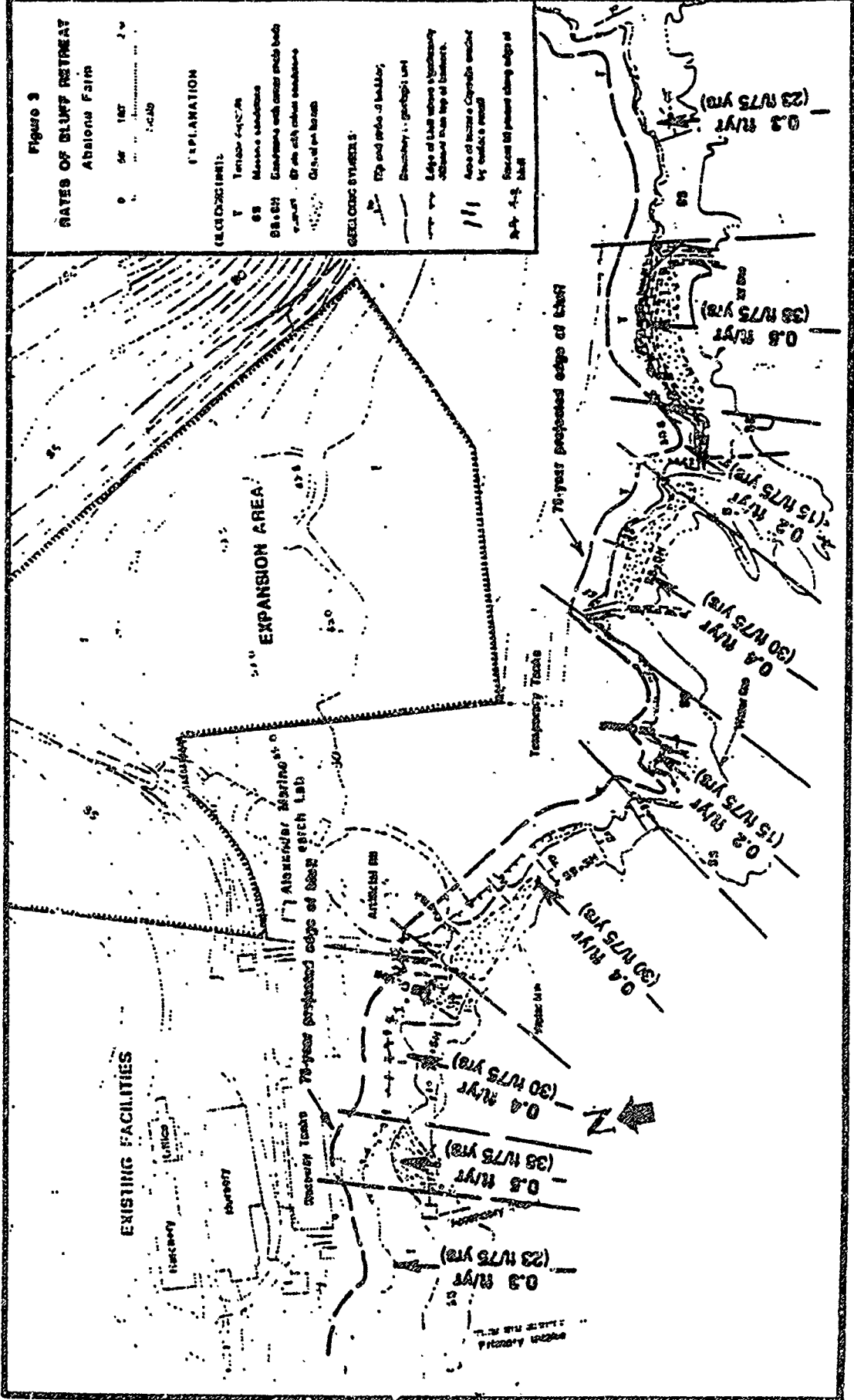
RELIEF CONTOURS

- T Terrace 4-12' M
- SS Marine sandstone
- SS+GK Sandstone with minor pebbles
- SS+GK Sandstone with minor pebbles
- SS+GK Sandstone with minor pebbles
- SS+GK Sandstone with minor pebbles

GEOLOGIC STRUCTURES

- Top and grade of bluff
- Boundary - gullies, etc.
- Edge of bluff where significantly different than top of bluff
- Area of incision - Corvallis member by creek's mouth
- Section 10 present along edge of bluff

Scale 1:50,000



rate of 0.5 ft/yr because of the low resistance of these units to erosion. These beds are only about 10-15 feet thick, so the period of more rapid erosion is not applicable to the entire 75-year projection interval.

The projected 75-year edge of bluff is shown on Figure 3 based on these estimated rates of retreat. This projection indicates that the project (proposed expansion area) will not be adversely affected by bluff retreat in the next 75 years. The seawater pond constructed at the Alexander Marine Research Laboratory ("Artificial fill" on map) and the existing Raceway Tanks may, however, be affected by future bluff retreat.

2) Long-Term Rates of Retreat

On a long-term basis, the site can be divided into three parts (Figure 4): 1) Segment 1: a low-level rate-of-erosion segment that extends from the easterly part of the study area to a point approximately west of the south edge of the Temporary Tanks; 2) Segment 3: a zone of higher-rate erosion of the bluff that would appear to be significantly greater than rates of erosion in Segment 1 on a long-term basis; and 3) Segment 2: a transition zone between Segment 1 and Segment 3 within which long-term erosion rates are transitional between those of Segment 1 and those of Segment 3.

Interpretation of long-term erosion rates from these data is somewhat conjectural depending on assumptions related to a typical terrace profile and the seaward extent of this terrace at the time sea level stabilized about 5,000 years ago. However, based on average rates in Segment 1 of 0.32 ft/yr and 0.4 ft/yr in Segment 3, the edge of the terrace 5,000 years ago would have been approximately 1,600 to 1,750 feet offshore from Segment 1. This is a reasonable projection considering the relatively shallow water offshore. This does not confirm that the short-term rates used above are correct, but it does indicate that they are reasonable over the long term.

3. Bluff Erosion

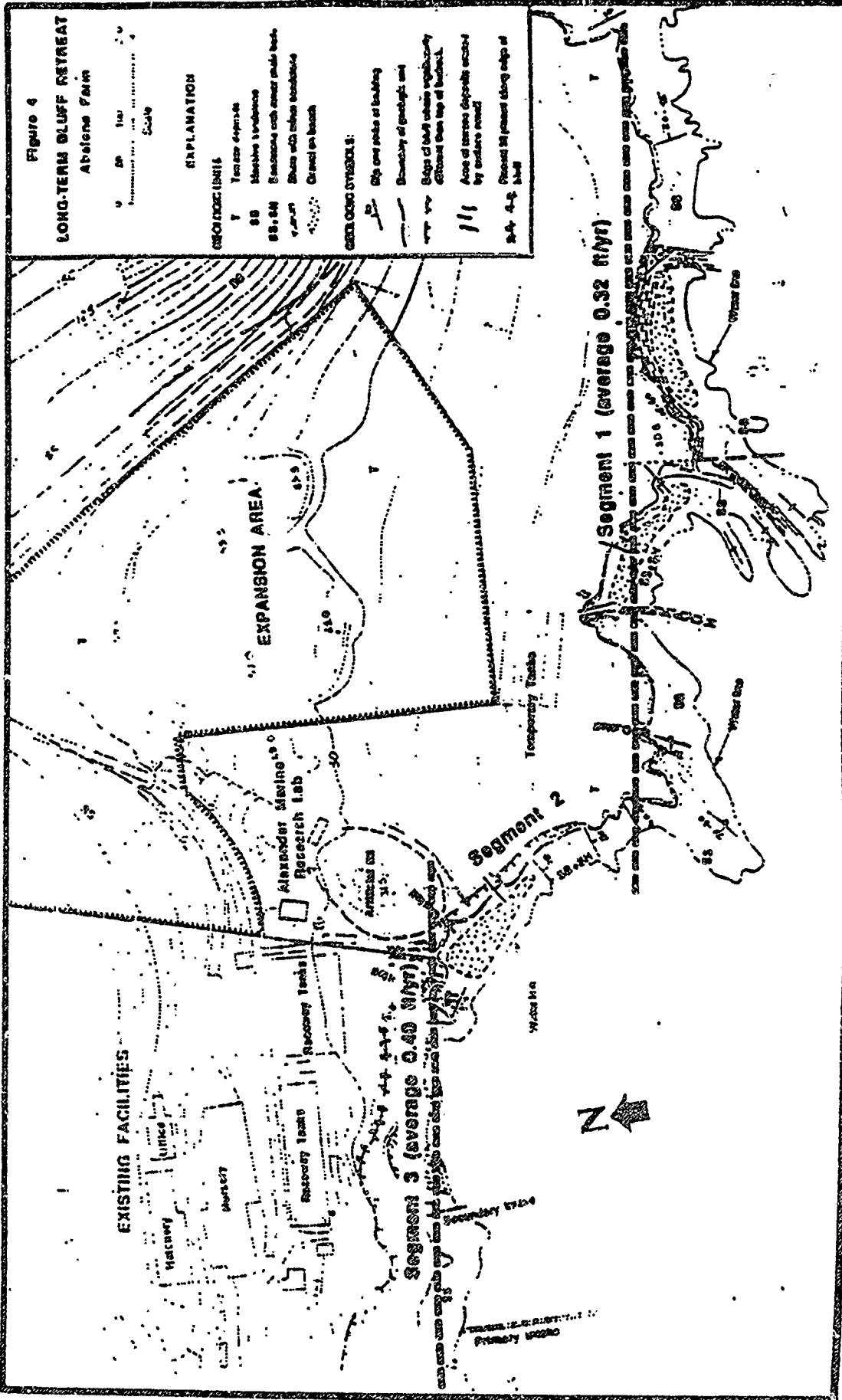
a. Surface Runoff

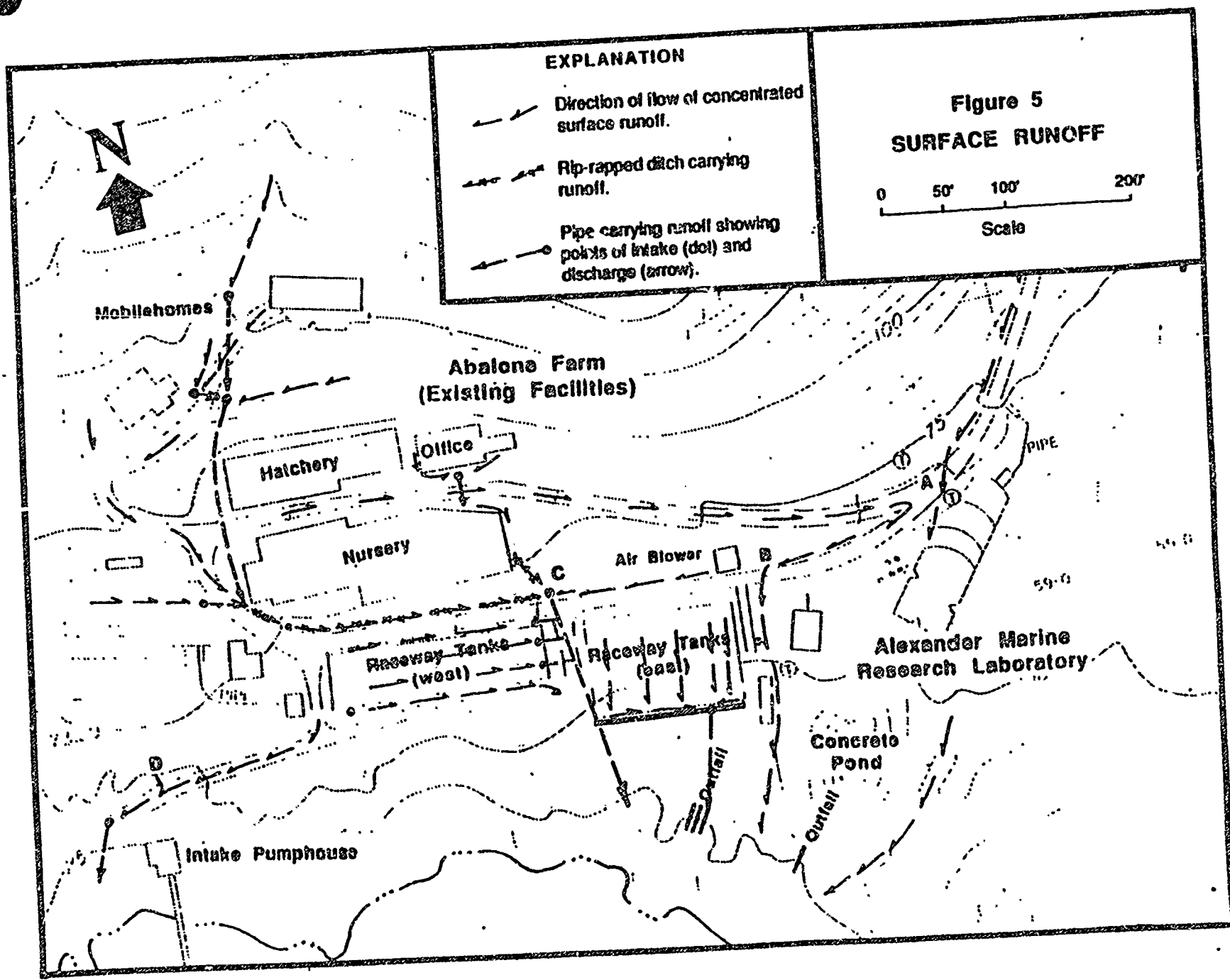
During the course of the site investigation, it was noted that there has been considerable erosion of the terrace deposits near the edge of the bluff in the area between the outfalls for the existing facilities and the Alexander Marine Research Laboratory (Figure 2). This erosion appears to be the result of surface runoff and/or spill of saltwater from the existing facilities, and additional areas of erosion may have been present at the bluff south of the Raceway Tanks prior to the recent placing of fill in this area.

Increased runoff should be expected as a result of the increased area of impervious surfaces (structures) and the reduced permeability resulting from compaction along the dirt and gravel roads. The arrangement of roads also would tend to intercept sheet flow and concentrate it near the area where the erosion has been identified (Figure 5). The open tanks catch some rainfall and discharge it to the outfall system along with the seawater. However, erosion appears to have been a significant problem at the existing facilities in the past, and erosion control will be important in the design of the expansion area.

b. Spills from the Saltwater Tanks

Discussions with Mr. Frank Oaks indicate that they have had problems in the past with plugging of the discharge with resulting overflow from the tanks. This has occurred for various reasons





EXPLANATION




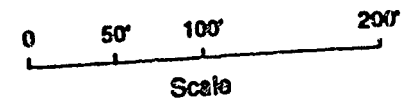
-  Direction of flow of concentrated surface runoff.
-  Rip-rapped ditch carrying runoff.
-  Pipe carrying runoff showing points of intake (dot) and discharge (arrow).

Figure 5
SURFACE RUNOFF



ORIENTAL ASSE
ENGINEERING
DATE PLOE 2/19/52
131

including abalone escaping to the discharge piping and growing to a size that plugs the pipe. As a result, they have been continually modifying the discharge system to utilize more open concrete drains that can be easily cleaned and limit the use of pipe to short sections where open drains are not feasible. This has substantially reduced plugging.

c. Erosion at the Outfalls

Erosion of the bluff resulting from discharge from the outfall pipes at the site does not appear to be a significant problem. The outfall from the existing facility discharges directly to a gravel or rocky beach, and erosion is insignificant. The outfall from the Temporary Tanks discharges onto rock in an area of highly resistant sandstone, and present and future erosion is probably insignificant.

d. Seepage at the Bluff

In addition to erosion from surface runoff, there is a zone of extensive seepage in the bluff seaward from the large concrete pond at the Alexander Marine Research Lab ("artificial fill" on the geologic map). This seepage apparently comes from water leaking from the pond and migrating laterally along the top of the bedrock surface (base of the more permeable terrace deposits) to the face of the bluff where it contributes to the otherwise natural erosion of the bluff.

Seepage is also present at the bluff seaward of the westerly of the two existing blocks of raceway tanks. This seepage is minor, and is not now an erosion problem.

4. Slope Stability

No evidence of past landslide conditions were observed at the site either in the bluff or on the slopes above the site. One small area of out-of-slope dip is present to the south of the westerly of the two existing raceways. This condition has been taken into account in assigning the rate of retreat in this area.

5. Seismic Considerations

No active or potentially active faults are known or suspected at or in the near vicinity of the site, and fault rupture hazards are insignificant.

Earthquakes generated by movement on major active faults in the region consist primarily of the expected magnitude 8.0-8.5 event on the San Andreas fault located approximately 43 miles to the northeast, and an event of considerable question on the Hosgri fault located approximately 5 miles offshore (PG&E, 1988). The maximum credible earthquake magnitude (M_w) for the Hosgri fault is approximately 7.2 (PG&E, 1988), but a much smaller magnitude is more likely. The expected large magnitude event on the San Andreas fault would likely generate maximum ground accelerations at the site in the range of 0.1g, and the questionable magnitude 7.2 event could generate ground accelerations of approximately 0.5g (Campbell, 1981). Lesser events are more likely, but a magnitude 6.0-6.5 earthquake on this fault would still generate accelerations up to approximately 0.3g.

B. PROJECT IMPACTS

1. Bluff Retreat

Estimated rates of bluff retreat based on geologic characteristics of the bluff and experience in other parts of San Luis Obispo County indicate that the project (proposed expansion area) will not be adversely affected by bluff retreat in the next 75 years. The seawater pond constructed at the Alexander Marine Research Laboratory ("Artificial fill" on Figure 2) and the existing Raceway Tanks, however, may be affected by future bluff retreat. These facilities can be removed at such time as bluff retreat becomes a problem as the value of these facilities would not warrant preventive measures.

2. Bluff Erosion

Runoff has been increased and concentrated in the area of the existing facilities, and erosion of the terrace deposits at the top of the bluff has been significant in some areas. The proposed facilities will also concentrate runoff, and measures should be taken to collect and convey this runoff over the bluff in a way that minimizes erosion.

Control of runoff concentrated on the steep access road to the intake pumphouse will also be important. This runoff is now collected in an open 8-inch pipe near the end of the road and discharged onto bedrock near the base of the bluff. The primary problem with this facility is that the terrace deposits erode easily, and the sediment in the runoff may plug this pipe in a heavy storm.

Spills of seawater from the raceway tanks has been reduced by utilizing open concrete drains to the greatest extent feasible. However, future plugging of the discharge system cannot be precluded and precautions should be taken to catch spilled seawater before it reaches the edge of the bluff.

The loose fill at the edge of the bluff southerly of the existing raceway tanks is susceptible to erosion, and should be planted as soon feasible (i.e., at the onset of the wet season).

The seepage of water leaking from the large pond at the Alexander Marine Research Lab is also contributing to erosion of the bluff. It is also possible that this seepage could develop into piping with a major washout of the terrace deposits and the overlying embankment on the seaward side of the pond. The process would be much the same as the failure of the Baldwin Hills Reservoir, but on a much smaller scale.

3. Slope Stability

No slope stability problems have been identified at the site and no impacts resulting from this hazard are expected.

4. Seismic Considerations

The expected large magnitude earthquake on the San Andreas fault 43 miles to the northeast will result in relatively minor groundshaking at the project site, and no significant impacts to the proposed project are expected. Some minor damage to existing structures should be expected, and there may be sloshing of water out of the tanks in the nursery and raceway tanks facilities. These effects should not be significant.

Occurrence of a large (magnitude 6.0-6.5) or major (magnitude 7) earthquake on the Hosgri fault located about 5 miles offshore could cause significant damage to the existing and proposed facilities. However, the actual occurrence of such an event during the life of the project is unlikely, and damage that may occur is not expected to result in significant secondary effects.

C. MITIGATION MEASURES

Potential impacts resulting from erosion by concentrated runoff or spills of seawater from the raceway tanks can be avoided or minimized by implementing the following mitigation measures:

General Recommendations:

- Concentrated runoff from the site should not be allowed to flow over the coastal bluff, but should be intercepted before reaching the bluff and diverted to control devices.
- All areas of recent fill along the edge of the bluff should be planted to fast-growing grasses at the onset of the wet season to minimize first-year erosion, with native, salt-tolerant vegetation (*****) being introduced as rapidly as feasible for long-term stability.
- Facilities to discharge collected runoff and seawater from the tanks on the site should be constructed so that the released water does not impact on the terrace deposits, but is released onto bedrock or the gravel beach. For most locations at the site, piping should extend down the bluff to an elevation of approximately 20 feet above mean sea level.
- Discharge facilities should be constructed so that they can be periodically modified to accommodate changing bluff configurations. The large diameter PVC pipe now in use would appear to be ideal for this purpose.

Specific Recommendations for the Existing Abalone Farm Facilities:

- Drainage control should be improved at Points A and B (Figure 5), north of the Alexander Marine Research Laboratory, so that concentrated runoff is conveyed westerly along the access road to the primary collection point C rather than crossing the road and flowing to the bluff along uncontrolled channels.
- An open concrete "V" ditch, similar to that along the southerly edge of the east raceway tanks, should be installed southerly from the west raceway tanks. This ditch could be located in the center or along the southerly edge of this access road. The ditch should be designed to carry the total seawater flow to these tanks in the event of a spill, or runoff from the local area for a 100-year storm, whichever is greater. The area between this access road and the bluff (now loose fill) should be graded to direct surface flow back to the "V" ditch to the extent that this is feasible.
- Drainage facilities along the road to the intake pumphouse should be revised as follows:
 - The intake to the pipe at the bottom of the road should be improved to include a concrete box configured to minimize sediment clogging (i.e., edges raised above road level but below the level of the berm at the south edge of the road).
 - Concentrated runoff from above the steep segment of this road (easterly of Point D

on Figure 5) should be intercepted and conveyed to the box inlet at the bottom of the road by a pipe buried in the roadway. (This improvement is intended to minimize runoff flowing down the steep segment of the road and consequent erosion and sedimentation at the box inlet.)

- Runoff from the steep segment of the road should be channeled in a non-erosive device located in the center of the road or on the inland side of the road, and conveyed to the box inlet at the bottom end of the road.
- Discharge from the pipe from the box inlet should be onto bedrock and not onto the softer terrace deposits (i.e., at or below elevation approximately 20 feet).

Specific Recommendations for the Abalone Farm Expansion Facilities:

- Control of excess surface runoff or a spill of seawater from the expansion facilities can be controlled by providing an open concrete ditch along the southerly perimeter of the facility.
- Diversion and control of runoff flowing toward the expansion facility should be governed by the General Recommendations above.

Specific Recommendations for the Alexander Marine Research Laboratory:

- Leakage from the concrete pond should be stopped or reduced to a level of insignificance, or the use of this facility should be terminated. Seepage at the bluff is substantial, and piping, with a major increase in the volume of flow and the possible collapse of the terrace underlying the seaward side of the pond, could develop at any time. The result could be a major scar on the coastal bluff.
- If use of this facility is to be terminated, then it should be removed and the site returned to its original configuration to the extent that this is feasible.
- The drainage course along the southeasterly side of the concrete pond should be improved to conform to the general recommendations listed above.

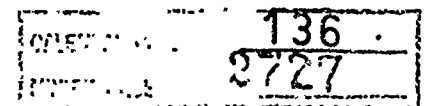
Respectfully submitted,



Donald O. Asquith, PhD
Engineering Geologist, EG-913
Registered Geophysicist, GP-89

REFERENCES

- Asquith, D. O., 1983, *Rates of Coastal Bluff Retreat, Pismo Beach, California: Coastal Zone '83*, p. 1195-1207.
- Campbell, K.W., 1981, *Near-source attenuation of peak horizontal ground acceleration: Bull. Seis. Soc. Amer.*, v. 71, p. 2039-2070.
- Hall, C. A., 1974, *Geologic Map of the Cambria Region, San Luis Obispo County, California: U.S. Geological Survey Map MF-599*.
- Kuhn, G. G., and F. P. Shepard, 1984, *Sea Cliffs, Beaches, and Coastal Valleys of San Diego County: Some Amazing Histories and Some Horrifying Implications: University of California Press*, 193 p.
- PG&E, 1986, *Final Report of the Diablo Canyon Long Term Seismic Program: prepared for the Nuclear Regulatory Commission, July 1988*.



ATTACHMENT A

**Copies of Photographs of a Sea Cliff North of Port San Luis in
San Luis Obispo County Taken in 1898 and 1945**

From Kuhn and Shepard, 1984

A-16

ORIGINAL PAGE	137
DUPLICATE PAGE	2728

Figure 4a
Sea cliff north of Port San Luis prior to 1890. Photo:
George W. Stose.



Figure 4b.
View from the same spot, 1945. Note the almost complete
absence of erosion in the interim. Numerous rocks can be
matched in the two photographs. Photo: U. S. Grant IV.



DEPTH	138
DATE	2729

Appendix B
TERRESTRIAL BIOLOGY REPORT

COLLECTOR PAGE	139
FIGURE PAGE	2730

VEGETATION SURVEY OF THE ABALONE FARM PROJECT SITE, CAYUCOS, CALIFORNIA

by
V. L. Holland, Plant Ecologist
David Keil, Plant Taxonomist

28 September 1988

INTRODUCTION

The Cayucos Abalone Farm is located on a marine terrace next to the Pacific Ocean at the western end of Villa Creek Road, north of Cayucos in San Luis Obispo County, California. The eastern portion of the property is bounded by steep hillsides covered by coastal scrub vegetation, and the western boundary is marked by the steep, eroded cliffs of the sea bluff that drops sharply down to a rocky beach along the ocean. The existing facilities of the Abalone Farm have been constructed on the marine terrace and the adjacent sea bluff of the northern half of the property. Much of the southern portion of the subject property located on the marine terrace has been cleared, and some construction activity was started prior to this survey. The steep hillsides to the east are relatively undisturbed.

DESCRIPTION OF THE VEGETATION

Botanical survey work for this project took place in early September, 1988. The botanical survey consisted of canvassing the area on foot, recording all of the plant species in identifiable condition and describing the plant habitats. Within the boundaries of the site, we identified over 100 plant species (see attached species list) and four terrestrial plant communities: (1) coastal valley grassland, (2) coastal scrub, (3) sea bluff coastal scrub and (4) anthropogenic (ruderal). In addition there is a well-developed intertidal and subtidal marine aquatic community along the shoreline to the west of the subject property. We have surveyed in detail the terrestrial communities but not the marine aquatic community, which is outside of our area of expertise.

1. Coastal Valley Grassland

The grassland on the site is dominated by annual, introduced species of grasses and forbs. The perennial, native bunchgrasses, which dominated the grassland prior to Spanish settlement, are found only sporadically on the hillsides. Historically, the changes in the composition of the grassland in this area are mostly a function of the introduction and invasion of alien plant species and changes in the kinds of animals (especially grazing livestock) and their grazing patterns. Cultivation and fire also may have played limited roles.

Grasslands occur on the marine terrace and at the base of the hillsides where finer textured soils tend to develop. These grasslands intergrade with coastal scrub on xeric, steep slopes and with sea bluff scrub along the cliff above the ocean. In transitional areas there are scattered shrubs such as coyote bush and coastal goldenbush in the grassland areas. Many of the grassland species also occur as understory species in the coastal scrub.

For the most part, the grassland area is dominated by species characteristic of other central coast valley grasslands such as *Brachypodium distachyon* (false brome-grass), *Bromus mollis* (soft chess brome), *Bromus diandrus* (riggnt brome), *Bromus rubens* (red brome), *Avena fatua* (wild oats), *Avena barbata* (slender wild oats), *Hordeum leporinum* (foxtail), *Lolium multiflorum* (wild rye), *Plantago lanceolata* (English plantain), *Vulpia myuros* (fescue), *Rumex angiocarpus* (sour dock) and many others (see species list).

A few of the native perennial grasses also occur on the site. *Danthonia californica* (California oat-grass), *Stipa lepida* (slender needle grass), and *Stipa pulchra* (purple needle grass) are bunch grasses that occur commonly along the California coastline in grasslands and grassland-coastal scrub mixed communities. A sod-forming perennial grass, *Distichlis spicata* (saltgrass) is locally common the site and is indicative of a high salt content in the soil that results from salt spray from the nearby beach.

2. Coastal Scrub Community

The coastal scrub community is composed of several species of soft-wooded, wind pruned, low growing shrubs and subshrubs 1-3 feet in height mixed with a variety of herbaceous species. It forms a somewhat open vegetational cover on the steep hillsides east of the existing facilities and marine terrace. The dominant species of the coastal scrub is *Artemisia californica* (California sagebrush). Common associated shrubs are *Baccharis pilularis* (coyote bush), *Mimulus aurantiacus* (bush monkey flower), *Hazardia squarrosa* (sawtooth goldenbush), *Isocoma veneta* (coastal goldenbush), *Lotus scoparius* (deerweed), and *Eriogonum parvifolium* (coastal buckwheat). Some of the understory species are also common in adjacent grasslands. Other species found in the coastal scrub are on the species list.

3. Sea Bluff Coastal Scrub

In the areas along the sea bluffs, the coastal scrub occurs along the rocky headlands just above high tide and along the margins of the erosion face of the bluff. It forms a narrow band of vegetation along the bluff consisting of low growing shrubs, succulents and herbs. At the top of the bluff it grades into the coastal valley grassland of the marine terrace. In some places along the bluff face, the plants in this community cling to nearly vertical rock faces just above the pounding surf.

Plants that grow on sea bluffs must be able to tolerate constant exposure to salt spray and be able to grow on highly eroded soils that are shallow and high in salt content. Common species of this community on the subject property are *Isocoma veneta* (coastal goldenbush), *Atriplex semibaccata* (Australian saltbush), *Atriplex californica* (California saltwort), *Carpobrotus edulis* (ice plant), *Distichlis spicata* (salt grass), *Dudleya caespitosa* (dudleya), and *Sida leprosa* var. *hederacea* (alkali mallow). In addition, some of the species common in the adjacent grassland mix with the sea bluff coastal scrub near the top of the bluff where the soils are better developed and not eroded.

4. Anthropogenic communities

Anthropogenic communities are those dominated by plants introduced by humans or maintained by human disturbance. On the subject property, the disturbance around the roadsides, buildings, holding ponds, cleared areas, etc. has created a habitat for weedy

species which dominate these areas. Common weeds are *Bromus diandrus* (ripgut brome), *Foeniculum vulgare* (fennel), *Plantago lanceolata* (English plantain), *Melilotus indica* (yellow sweet clover), *Bromus mollis* (soft chess brome), *Avena barbata* (slender wild oats), *Carduus pycnocephalus* (Italian thistle), *Brassica geniculata* (perennial mustard), and others listed on the species list. In addition, some of the weedy plants have invaded the surrounding native plant communities and have become occasional to dominant components of these communities.

The weedy plants are almost all alien species introduced to California from other areas of the world. They are characterized by their ability to colonize disturbed sites. Some are very invasive and have displaced native plants. The introduced plants are marked in the species list with an asterisk (*).

Another example of an anthropogenic community is the introduced trees such as the pines and cypresses that have been planted on the hillside and along the fence line near the southern property boundary. These introduced trees are small at present, but can be expected to have an influence on the associated flora and fauna; however, because there are so few of them, their impact is probably not significant.

5. Marine Aquatic Plant Community

A zone of intertidal and subtidal plants extends westward from the subject property. These communities are composed of one or two species of *Phyllospadix* (surfgrass), which are marine angiosperms, and a wide variety of marine algae. We did not inventory the marine aquatic community offshore from the abalone farm, but this should be done by a qualified algologist. We did note that one or more species of kelps (brown algae) are harvested to use as food for the abalone at the abalone farm. We do not know whether these are kelps growing immediately offshore from the subject property or harvested elsewhere off the California coast. Kelp that is not consumed by the abalone is dumped over a cliff at the abalone farm onto the rocky beach to be swept away by the waves. We do not know whether either the harvesting or the dumping has an impact on the marine aquatic community or on the fauna of the intertidal or subtidal zones.

FLORA OF THE CAYUCOS ABALONE FARM PROPERTY

There is a diversity of plant species in the area as indicated by the extensive species list (Table 1). However, it is important to note that this is by no means a complete list of the plants present on the site. Plant species composition, especially herbaceous cover, varies seasonally. During September, a large number of the species are not present in identifiable condition. Spring flowering ephemerals are represented only by their dry remains. Consequently, the plants listed are only those found in identifiable condition during the fall survey. A thorough survey through the entire year would be necessary for a complete listing of the area's flora.

RARE AND ENDANGERED PLANT SPECIES

We did not encounter any rare and/or endangered plant species in our survey of the Cayucos Abalone Farm. However, because many of the plants were not in identifiable condition during the on-site survey, we cannot state with certainty that none occur there. Some rare species of coastal San Luis Obispo County are spring-flowering ephemerals that generally are withered or shattered by September. Our overall impression is that there

probably are not any endangered or threatened species currently on the subject site, but a spring survey would be necessary for us to state this conclusively.

IMPACTS OF THE PROJECT

The development of the proposed project has or will result in the removal and destruction of most of the existing vegetation on the marine terrace within the project site. The communities that will be affected to the greatest extent are the grasslands and the sea bluff coastal scrub. The disturbance associated with construction activities and operation of the abalone farm can be expected to enhance the opportunities for further invasions of alien weedy species at the expense of the existing communities.

Operation of the abalone farm and construction of additional facilities could also result in increased erosion of the sea bluff. Wave erosion of sea bluffs is a common phenomenon along the California coastline as is gully formation in the marine terraces. Removal of vegetative cover tends to accelerate the rate of erosion. In the areas where facilities of the abalone farm have been developed, erosion of the sea bluff is already a serious problem. There has been a significant loss from the bluff face, and soil is eroding from the terrace. Because of the rapid erosion, vegetation has not kept pace and only a sparse vegetative cover been able to develop on the eroded areas. Even the use of concrete on the bluff tops and along the slopes has not successfully controlled the erosion.

RECOMMENDATIONS

Further development on the site should be situated as far back from the edge of the sea bluff as possible. No disturbance should occur on the bluff itself or on the hillsides found on the eastern portion of the site. These recommendations make economic as well as ecological sense. Relocation of facilities undercut by erosion would be more costly than placing the facilities away from the waves in the first place.

Revegetation of areas that have been disturbed by the construction activities should emphasize use of native species well-adapted to the California coastline. Use of exotic ornamentals should be discouraged. Species known to invade and displace native vegetation should be avoided; e.g., *Cortaderia jubata* (pampas grass), *Carpobrotus* spp. (ice plants).

The marine aquatic communities should be investigated by qualified biologists to determine the project's impact on the algae and other marine life.

REFERENCES

- California Department of Fish and Game. 1988. Natural Diversity Data Base. Special Plants. 58 pp.
- Holland, V. L. and D. Keil. 1986. California Vegetation. El Corral Publications. 292 pp.
- Hoover, R. F. 1970. The Vascular Plants of San Luis Obispo County, California. University of California Press, Berkeley.
- Munz, P. A., and D. D. Keck. 1959. A California Flora. University of California Press, Berkeley.
- _____. 1968. Supplement to A California Flora. University of California Press, Berkeley.
- Smith, J. P., and R. York. 1984. Inventory of Rare and Endangered Vascular Plants of California. California Native Plant Society, Sacramento.
- United States Department of the Interior, Fish and Wildlife Service. 1983. Endangered and Threatened Wildlife and Plants; Supplement to Review of Plant Taxa for Listing; Proposed Rule. Federal Register 48 (229):53640-53670.

Table 1
Plant List for Cayucos Abalone Farm Project

Trees

none except ornamentals

Shrubs

Artemisia californica	Coastal sagebrush
Baccharis pilularis	Coyote bush
Eriogonum parvifolium	Coastal buckwheat
Hazardia squarrosa	Sawtooth goldenbush
Isocoma veneta	Coastal goldenbush
Lotus scoparius	Deerweed
Mimulus aurantiacus	Sticky monkeyflower
* Nicotiana glauca	Tree tobacco
** Opuntia ficus-indica	Prickly-pear cactus

Herbs

* Amaranthus albus	Amaranth
* Amaranthus hybridus	Amaranth
Ambrosia acanthicarpa	Ragweed
* Anagallis arvensis	Scarlet pimpernel
* Anthemis cotula	Dog-fennel
Astragalus nuttallianus	Locoweed
Atriplex californica	California saltwort
* Atriplex semibaccata	Australian saltbush
* Avena barbata	Slender wild oats
* Avena fatua	Common wild oats
* Brachypodium distachyon	False brome-grass
* Brassica geniculata	Perennial mustard
* Bromus diandrus	Ripgut brome-grass
* Bromus mollis	Soft chess brome-grass
* Bromus rubens	Red brome-grass
Calystegia macrostegia	Wild morning-glory
Calystegia subacaulis	Dwarf morning-glory
* Carduus pycnocephalus	Italian thistle
* Carpobrotus chilensis	Ice plant
* Carpobrotus edulis	Ice plant
* Centaurea melitensis	Golden star thistle
* Centaurea solstitialis	Yellow star thistle
* Chenopodium album	Lamb's quarter
* Chenopodium ambrosioides	Mexican-tea
* Chenopodium murale	Goosefoot
** Chrysanthemum coronarium	Garland daisy
* Convolvulus arvensis	Field bindweed
* Conyza bonariensis	Hairy horseweed
* Conyza canadensis	Horseweed
* Crypsis schoenoides	Mat grass
* Cynodon dactylon	Bermuda grass
Cyperus eragrostis	Umbrella sedge

- * *Dactylis glomerata*
 - Danthonia californica*
 - Dichelostemma pulchellum*
 - Distichlis spicata*
 - Dudleya caespitosa*

 - Elymus triticoides*
 - Eriogonum fasciculatum*
 - * *Erodium botrys*
 - * *Erodium cicutarium*
 - * *Erodium moschatum*
 - Eschscholzia californica*

 - Filago californica*
 - * *Foeniculum vulgare*

 - * *Gastrophysa viridula*
 - * *Geranium dissectum*
 - Gnaphalium bicolor*
 - * *Gnaphalium luteoalbum*
 - Gnaphalium sp.*

 - * *Hedysarum creticum*
 - Helianthemum scoparium*
 - Hemizonia corymbosa*
 - Hemizonia increscens*
 - Hemizonia luzulifolia*
 - * *Hordeum leporinum*
 - Hypochoeris glabra*

 - * *Lactuca scariola*
 - Lamarckia aurea*
 - * *Lavatera cretica*
 - ** *Limonium perezii*
 - * *Lolium multiflorum*
 - * *Lotus corniculatus*
 - Lythrum hyssopifolia*

 - Madia sativa*
 - * *Medicago polymorpha*
 - * *Melilotus albus*
 - * *Melilotus indicus*

 - * *Panicum capillare*
 - Phyllospadix sp.*
 - * *Plantago lanceolata*
 - * *Polygonum arenastrum*
 - Polygonum lapathifolium*
 - * *Polypogon interruptus*
 - * *Polypogon monspeliensis*

 - * *Raphanus sativus*
 - * *Rumex angiocarpus*
 - * *Rumex conglomeratus*
- Orchard grass
 - California oat-grass
 - Blue dicks
 - Salt grass
 - Dudleya

 - Beardless wild-rye
 - Turkey mullein
 - Storkbill filaree
 - Redstem filaree
 - Greenstem filaree
 - California poppy

 - Filago
 - Fennel

 - Nitgrass
 - Cutleaf geranium
 - Bicolored everlasting
 - Cudweed
 - Everlasting

 - Hedysarum
 - Rush-rose
 - Tarweed
 - Tarweed
 - Hayfield tarweed
 - Foxtail barley
 - Smooth cat's-ear

 - Prickly lettuce
 - Goldentop grass
 - Bush mallow
 - Statice
 - Annual ryegrass
 - Bird's-foot trefoil
 - Loosestrife

 - Coast tarweed
 - Bur-clover
 - White sweet-clover
 - Yellow sweet-clover

 - Witchgrass
 - Surf-grass
 - English plantain
 - Common knotweed
 - Smartweed
 - Ditch polypogon
 - Rabbitfoot grass

 - Wild radish
 - Sour dock
 - Knotted dock

COLLECTOR'S NO.	146
DATE	2737

- * Rumex pulcher
- * Salsola iberica
- * Sida leprosa var. hedericea
- * Silene gallica
- * Solanum douglasii
- * Sonchus oleraceus
- * Spergularia macrotheca
- * Spergularia rubra
- * Stephanomeria sp.
- * Stipa lepida
- * Stipa pulchra

Trifolium sp.

- * Xanthium spinosum
- * Xanthium strumarium

Fiddle dock

- Russian thistle
- Alkali mallow
- Windmill pink
- Black nightshade
- Common sow-thistle
- Large-flowered sand-spurry
- Red-flowered sand-spurry
- Wire-leuce
- Slender needlegrass
- Purple needlegrass

Clover

- Spiny clothur
- Cocklebur

- * Weedy species not native to California.
- * Planted as ornamental.

Appendix C
MARINE BIOLOGY REPORT

Report on the Cayucos Abalone Farm and Environs,
With Respect to the Marine Environment

Fred L. Clogston

1988

UNIVERSITY OF CALIFORNIA	149
LIBRARY	2740

The Cayucos Abalone Farm site is on a coastal terrace of the Franciscan formation with sandstone cliffs, beach and near-shore reefs. Indentations as surge channels cut into the shore and cliffs. The edge of terrace shows natural erosion due to run-off in the winter rain storms. Potentially any development utilizing water on the terrace could exacerbate the erosion process. As the existing system and the proposed addition use a flow through system of sea water such potential for erosion exists. In the existing system, water is channeled from the culture tanks into drain pipes. On the downhill side of the system of tanks, curbing and gutters adjacent to the bluff edge channel overflow water and seasonal rain water into the drainage pipes. This water is released into steep sided declivities in the cliff face to enter the ocean through surge channels. This minimizes erosion due to Man's activities at the site. In the expansion area, a comparable system is proposed to control run-off, overflow and drainage from upwards to 240, 700 gallon growing tanks on five terraces. Erosion of the coastal terraces will occur with or without Man's activities. The system in use and the design for the proposed expansion should minimize additional effects.

The intertidal and near-shore habitat and its biota are naturally subjected to materials from run-off after rains. The wave action and tidal currents in the ocean at such times tends to distribute silt so that a natural, highly diverse assemblage of plants and animals is maintained along this section of coast line. From time to time, isolated incidents of whole-sale slumping and run-off silting as well as temporary build up of over-burdens of algal debris do cause limited and short term deleterious effects on

the biota. Seasonal variations in sea conditions also cause coming and going of sand in intertidal channels in rock reefs. This is a natural cyclic phenomenon on such shore lines. Such areas normally recover quickly with recruitment of developmental stages from nearby unaffected areas.

The typical rocky shore assemblage of intertidal flora and fauna can be found at the site. As the site has very limited reef area with boulders lying on a base of sand, mud or gravel compared to the shore a short distance east toward Cayucos, or up the coast beyond Cambria, there is over-all lower species diversity here. A typical rocky shore assemblage is seen at the site displaying zonal distribution influenced by the tide height fluctuations of the area.

In the uppermost horizon of the intertidal area, the limpet, Collisella digitalis and the periwinkle snail, Littorina keenae are common on rock surfaces with scattered dense clumps of the small grey-brown acorn barnacle Chthamalus dalli. In cracks and overhangs at this height, the "rock louse" Isopod, Ligia occidentalis, are sometimes lurking to range over the open rocks at twilight. Where irregularities in the rock allow for standing water, the green alga, Enteromorpha intestinalis grows and affords a habitat for the Harpacticoid Copepod, Tigriopus californicus.

Lower on this rocky shore, dense populations of the white acorn barnacle, Balanus glandula, appear and occur on rock surfaces through out the rest of the intertidal shore. The periwinkle snail, Littorina scutulata, replaces L. keenae in this region, as does the limpet C. scabra replace C. digitalis. A broad dense band of brown

151
2712

alga, Endocladia muricata, and the red alga, Gigartina agardhii, nearly black when dry, is characteristic at this tidal horizon. Tufts of the green alga, Ulva taeniata and Cladophora columbiana occur on the upper half of rocky beaches here. The encrusting brown alga Ralfsia pacifica occurs like scattered tar splotches here and downward. The turban snail, Tequila fenebralis is abundant and here and there, especially in tide pools, these black shells house hermit crabs, Pagurus samuelis and P. granosimanus. Dense populations of the aggregate anemone, Anthopleura elegantissima, covered with bits of shell, are found on rock surfaces in this region above mid-tide level. The large green Anemone, A. xanthogrammica, occur singly scattered down the remainder of the beach. Dense beds of the California mussel, Mytilis Californianus, is associated with the goose-neck barnacle, Polycipes polymerus. Below mid-tide level, the strap-like brown alga, Egregia menziesii, is common along with the surf grass, Phyllospadix scouleri. Green alga, Ulva lobata, and red "turkish towel", Gigartina spp. are common in the lower horizons along with Iridea cordata. Tide pools contain the coralline red algae, Corallina officianalis, Bossiella spp. and encrusting corallines, Lithothamnion spp. appearing like pink spilled paint. Dorid nudibranch mollusks such as the lemon yellow, Archidoris montereyensis, are occasionally seen among tidepool algae in the lower regions of the shore along with the kelp crab, Pugettia producta and the rock crab, Cancer antennarius. Where boulders are present, infrequent on this shore, young stages of snails such as the black abalone, Haliotus crocherodii, and chitons such as Stenoplax heathiana are found with a variety of encrusting sponges, colonial

ascidians, calcareous tube worms, Spirorbis spp., and the procellaria crab, Petrolisthes cinctipes.

In the extreme low intertidal occur stands of the brown alga, Laminaria dentigera. Near shore are beds of kelp, Macrocystis pyrifera, the pea kelp, and, Nereocystis lutkeana, the bull kelp.

OFFICE OF PLANNING AND RESEARCH

1400 TENTH STREET
SACRAMENTO, CA 95814



August 11, 1989

Judy Brown
State Lands Commission
1807 13th Street
Sacramento, CA 95814

Subject: The Abalone Farm Development Plan/SCH# 89071212

Dear Ms. Brown:

The State Clearinghouse submitted the above named environmental document to selected state agencies for review. The review period is now closed and none of the state agencies have comments. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call Garrett Ashley at 916/445-0613 if you have any questions regarding the environmental review process. When contacting the Clearinghouse in this matter, please use the eight-digit State Clearinghouse number so that we may respond promptly.

Sincerely,

A handwritten signature in dark ink, appearing to read 'David C. Nunenkamp'.

David C. Nunenkamp
Chief
Office of Permit Assistance

154
28745