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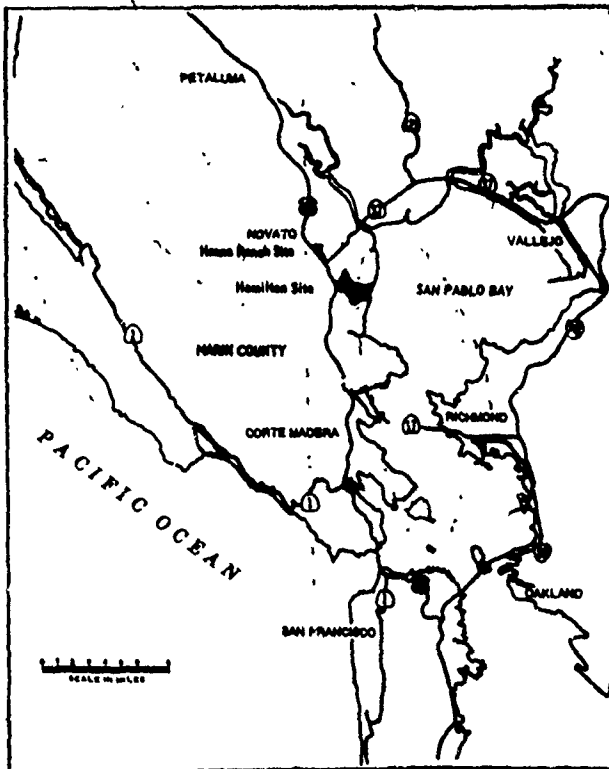
**DRAFT
ENVIRONMENTAL STATEMENT**

**NOVATO CENTER
REGULATORY PERMIT APPLICATION
BY NOVATO CENTER INC.
MARIN COUNTY, CALIFORNIA
PUBLIC NOTICE 10138-33**

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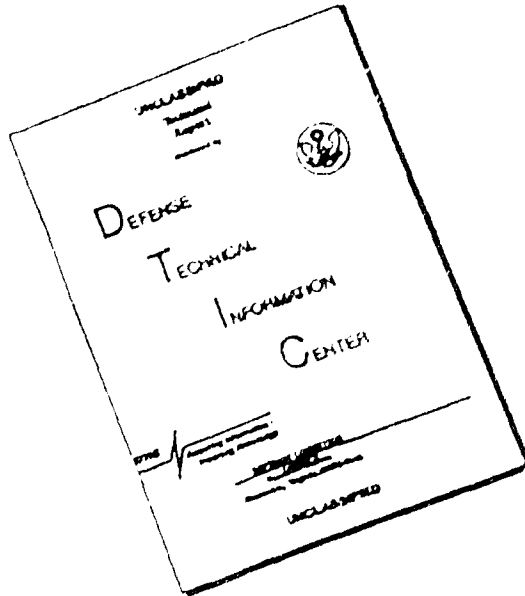


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**U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CALIFORNIA
JULY 1979**

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) NOVATO CENTER, REGULATORY PERMIT APPLICATION, NOVATO, MARIN COUNTY, CALIFORNIA		5. TYPE OF REPORT & PERIOD COVERED Draft Environmental Statement, (9)
7. AUTHOR(s)		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Corps of Engineers, San Francisco District 211 Main Street San Francisco, CA 94105		8. CONTRACT OR GRANT NUMBER(s) (12) 217p.
11. CONTROLLING OFFICE NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Office of the Chief of Engineers U.S. Department of the Army Washington, DC 20314		12. REPORT DATE July 1979 13. NUMBER OF PAGES 103 15. SECURITY CLASS. (of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
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18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary; and identify by block number) Commercial Development Regional Shopping Center		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Filling of a 56-acre area of historic tidelands, including 8 acres of existing brackish marsh for the construction of a regional shopping center with 986,000 square feet of gross leasable space. The project also includes excavator of approximately 390,000 cubic yards from historic tidelands on an adjacent property to supply a portion of the needed fill material. 391 022 ↑ JML		

COVER SHEET
NOVATO CENTER
MARIN COUNTY, CALIFORNIA

AUG 14 1979

REGULATORY PERMIT APPLICATION BY
NOVATO CENTER INC.
PUBLIC NOTICE 10138-33

(X) DRAFT ENVIRONMENTAL STATEMENT () FINAL ENVIRONMENTAL STATEMENT

Responsible Agency: U.S. Army Engineer District, San Francisco
211 Main Street
San Francisco, CA 94105

Contact Person: Dennis Cerese
Environmental Protection Specialist
Action Officer for Permit No. 10138-33
Regulatory Functions Branch
San Francisco District Corps of Engineers
(415) 556-5426

1. Name of Action: (X) ADMINISTRATIVE () LEGISLATIVE

2. Authority. Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act.

3. Description of Action. The applicant proposes to fill 48 acres of historic wetland and 8 acres of existing brackish marsh, determined to be important wetlands. A portion of the 56 acres proposed to be filled and an adjacent upland portion of the applicant's property are proposed as the site for a 77-acre regional shopping center. No development plans have been submitted for the remainder of the area proposed to be filled.

4. Environmental Impacts. Destruction of important wetland habitat; loss of floodplain, increased flooding hazard for adjacent lands, increased seismic and settlement hazards, increased runoff, decreased air and water quality, increased traffic volumes, change in land use from open space to commercial use, increased demand for city services, increased revenue for the City of Novato, alteration of views from surrounding areas. Provisions of a regional shopping center, increased employment.

5. Alternatives Considered. No project, reduced project, development in accordance with City Zoning, alternate project site at Hamilton Air Force Base.



DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
211 MAIN STREET
SAN FRANCISCO, CALIFORNIA 94105

SPNED-E/SPNCO-R

25 JUL 1979

RESPONSE REQUIRED BY: 10 SEP 1979

NOVATO CENTER DRAFT ENVIRONMENTAL STATEMENT: COMMENT PERIOD

TO WHOM IT MAY CONCERN:

1. As announced in Public Notice No. 10138-33 (27 January 1978), Novato Center Inc., 1290 Howard Avenue, Burlingame, California 94010, has applied for a Department of the Army permit to fill approximately 56 acres of former tidelands including 8 acres of existing brackish marsh, retain unauthorized fill placed upon approximately 12 acres, excavate from historic tidelands on an adjacent property to supply fill material for the purpose of construction of a regional shopping center in Novato, California.
2. In response to the National Environmental Policy Act of 1969, Public Law 91-190, the San Francisco District, U.S. Army Corps of Engineers, has prepared a Draft Environmental Statement (DES) for the subject permit application. A Notice of Intent to prepare the Draft ES was published in the Federal Register 8 May 1979.
3. The District is now soliciting comments and views of appropriate government agencies, interested groups and individuals concerning the DES. Please submit your comments to the District Engineer, San Francisco District, by the date indicated above so that they can be considered along with other relevant information in preparing the Final Environmental Statement.
4. Copies of the DES are available for review by contacting the San Francisco District (415-556-5426) and at the Marin County Free Library, Civic Center and Novato branches.

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Sincerely yours,

JOHN M. ADSIT
 Colonel, CE
 District Engineer

SUMMARY

NOVATO CENTER
REGULATORY PERMIT APPLICATION

1. Authority. Section 10 of the River and Harbor Act of 1899 and Section 404(b) of the Clean Water Act.
2. Purpose and Need. The purpose of the proposal is to develop a regional shopping center on the site. Market studies have indicated that such a shopping center is feasible.
3. Comparison of Alternatives.

<u>Impact</u>	<u>Alternatives*</u>				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Geology/Seismicity	0	-	-	-	-
Hydrology	0	-	-	-	0
Water Quality	0	-	-	-	-
Vegetation and Wildlife	0	-	0	-	-
Traffic	0	-	-	-	-
Air Quality	0	-	-	-	-
Noise	0	0	0	0	0
Land Use Plans	-	-	-	-	0
Population/Housing	0	0	0	0	0
Employment	0	+	+	+	+
Economics	0	+	+	+	+
Public Services/Utilities	0	-	-	-	-
Visual Quality	0	-	-	-	0
Cultural Resources	0	0	0	0	0
Recreation	0	0	0	0	0
Community Cohesion	0	+	+	+	+

+ Beneficial Impact
0 No Significant Impact
- Adverse Impact

*The alternatives are: (1) No Project; (2) Proposed Project; (3) Reduced On-Site Project; (4) Development in Accordance with Current City Zoning; and (5) Hamilton Air Force Base.

SUMMARY OF SIGNIFICANT IMPACTS

4. Alternative #1.

- a. - Non-conformance with the City of Novato General Plan.

5. Alternative #2.

a. Geology/Seismicity.

- Potential for differential settlement causing damage to structures, utility lines, drainage channels and sewers.

- Potential for ground shaking in the event of an earthquake causing damage to structures and infrastructure.

- Potential for ground failure (liquefaction, lateral spreading lurching) if ground shaking occurs.

b. Hydrology.

- Reduction in on-site storage potential by 350 acre-feet increasing off-site flood hazard to Scottsdale Pond, Highway 101, the Rowland Boulevard interchange and Highway 37.

- Potential flooding of parking areas by extremely high tides should the Novato Creek levees fail.

- Potential for large floodflows across the site and flooding of Rowland Boulevard interchange, if the two culverts crossing the site are obstructed by debris or their flow capacity is otherwise reduced during a large flood on Novato Creek.

c. Water Quality.

- Increased surface runoff from the project site into Novato Creek.

- Decreased quality of runoff from on-site pollutants (litter, oil, fertilizer, pesticides, animal wastes).

- Increased erosion and turbidity in runoff during construction activities.

d. Vegetation and Wildlife.

- Destruction of approximately eight acres of brackish marsh.

- Destruction of approximately fifteen acres of oak woodland.
- Creation of a 37-acre lake with some marsh vegetation on the state land east of the railroad line.
- Installation of water control devices to allow restoration of tidal marsh to the southern portion of land owned by the State Lands Commission.

e. Traffic.

- Increased traffic congestion on U.S. 101 south of the State Route 37 interchange.
- Increased accident potential for vehicles using the proposed northbound U.S. 101 off ramp.
- Increased congestion of U.S. 101 due to future development on land adjacent to the shopping center.

f. Air Quality.

- Hydrocarbon and nitrogen dioxide emission concentrations for the subregion exceed the Ambient Air Quality Standards.
- Temporary decrease in air quality during project construction due to equipment emissions, dust and particulates.

g. Land Use Plans.

- Conflict with Corps policy on wetlands.
- Conflict with Federal policy on modification of floodplains.
- Alteration of the site from open space to intensive urban use.
- Creation of major commercial competition to downtown Novato business district.
- Change in zoning from industrial to commercial use for the portion of the site south of Lynwood Slough requiring an amendment to the City of Novato General Plan.

h. Employment.

- Creation of about 2,000 jobs.

i. Economics.

- Projected generation of surplus revenue over costs to the City of Novato.

j. Public Services/Utilities.

- Increased consumption of gas, electricity and water.
- Increased wastewater generation.
- Increased need for police and fire services.

k. Visual Quality.

- Alteration of the view of the bay plain.
- Reinforcement of expanding strip commercial development along Highway 101.
- Unmitigated view of 44 acres of parking from Highways 37 & 101 and from surrounding hills.

l. Community Cohesion.

- Provision of a regional shopping center for area residents.
- Potential adverse economic impact on business in the downtown commercial area.

6. Alternative #3.

a. Geology/Seismicity.

- Potential for differential settlement causing damage to structures, utility lines and sewers.
- Potential for groundshaking in the event of an earthquake.
- Potential for ground failure (liquefaction, lateral spreading, lurching) if ground shaking occurs causing damage to structures.

b. Hydrology.

- Reduction in on-site storage potential.
- Potential for shallow flooding of parking areas by extremely high tides should the Novato Creek levees fail.

c. Water Quality.

- Increase in on-site surface runoff into Novato Creek.
- Decrease in quality of surface runoff due to contaminants from engineered surfaces.

d. Traffic.

- Increased traffic congestion on U.S. 101 south of the State Route 37 interchange.

e. Air Quality.

- Hydrocarbon and nitrogen dioxide emission concentrations for the subregion exceed the Ambient Air Quality Standards.
- Temporary decrease in air quality during project construction due to equipment emissions, dust and particulates.

f. Land Use Plans.

- Conflict with federal policy on modification of floodplains.
- Conversion of open space and urban use.
- Creation of major commercial competition to downtown Novato business district.

g. Employment.

- Creation of about 2,000 jobs.

h. Economics.

- Projected generation of surplus revenue over costs to the City of Novato.

i. Public Services/Utilities.

- Increased consumption of gas, electricity and water.
- Increased wastewater generation.
- Increased need for police and fire services.

j. Visual Quality.

- Alteration of the view of the bay plain.

- Reinforcement of expanding strip commercial development along Highway 101.

- Unmitigated view of parking areas from highways 37 & 101 and from surrounding hills.

k. Community Cohesion.

- Provision of a regional shopping center for area residents.

- Potential adverse economic impact on businesses in the downtown commercial area.

7. Alternative #4.

a. Geology/Seismicity.

- Potential for differential settlement causing damage to structures, utility lines, drainage channels and sewers.

- Potential for ground shaking in the event of an earthquake causing damage to structures and infrastructure.

- Potential for ground failure (liquefaction, lateral spreading, lurching) if ground shaking occurs.

b. Hydrology.

- Reduction in on-site storm potential by 350 acre-feet increasing off-site flood hazard to Scarsdale Pond, Highway 101, the Rowland Boulevard interchange and Highway 37.

- Potential flooding of parking areas by extremely high tides should the Novato Creek levees fail.

- Potential for large flood flows across the site and flooding of Rowland Boulevard interchange, if the two culverts crossing the site are obstructed by debris or their flow capacity is otherwise reduced during a large flood on Novato Creek.

c. Water Quality.

- Increased surface runoff from the project site into Novato Creek.

- Decreased quality of runoff from on-site pollutants (litter, oil, fertilizer, pesticides, animal wastes).

- Increased erosion and turbidity in runoff during construction activities.

d. Vegetation and Wildlife.

- Destruction of eight acres of brackish marsh.
- Destruction of approximately fifteen acres of oak woodland.
- Creation of a 37-acre lake with some marsh vegetation on the state land east of the railroad line.

e. Traffic.

- Increased traffic congestion on U.S. 101 south of the State Route 37 interchange.
- Increased accident potential for vehicles using the proposed northbound U.S. 101 off ramp.
- Increased congestion of U.S. 101 due to future development on land adjacent to the shopping center.

f. Air Quality.

- Impacts would be greater than Alternative #2.
- Temporary decrease in air quality during project construction due to equipment emissions, dust and particulates.

g. Land Use Plans.

- Conflict with Federal policy on modification of floodplains.
- Conflict with Corps policy on destruction of wetlands.
- Conversion of open space to intensive urban use.
- Creation of major commercial competition to downtown Novato business district.

h. Employment.

- Creation of about 2,000 jobs associated with the shopping center and an undetermined number of jobs associated with industrial development.

i. Economics.

- Probable generation of surplus revenue over costs to the City of Novato.

j. Public Services/Utilities.

- Increased consumption of gas, electricity and water.
- Increased wastewater generation.
- Increased need for police and fire services.

k. Visual Quality.

- Alteration of the view of the bay plain.
- Reinforcement of expanding strip commercial development along Highway 101.
- Unmitigated view of parking areas from highways 37 & 101 and from surrounding hills.

l. Community Cohesion.

- Provision of a regional shopping center for area residents.
- Potential adverse economic impact on businesses in the downtown commercial area.

8. Alternative #5.

a. Geology/Seismicity.

- Potential for differential settlement causing damage to structures, utility lines, drainage channels and sewers.
- Potential for ground shaking in the event of an earthquake causing damage to structures and infrastructure.
- Potential for ground failure (liquefaction, lateral spreading, lurching) if ground shaking occurs.

b. Water Quality.

- Increased surface runoff from the project site into Novato Creek.



- Decreased quality of runoff from on-site pollutants (litter oil, fertilizer, pesticides, animal wastes).

- Increased erosion and turbidity in runoff during construction activities.

c. Vegetation and Wildlife.

- Destruction of approximately 10 acres of riparian vegetation.

d. Traffic.

- Increased congestion on Highway 101.

- Increased congestion at the Bel Marina Key and Nave Drive intersection.

e. Air Quality.

- Hydrocarbon and nitrogen dioxide emission concentrations for the subregion exceed the Ambient Air Quality Standards.

- Temporary decrease in air quality during project construction due to equipment emissions, dust and particulates.

f. Employment.

- Creation of about 2000 jobs.

g. Economics.

- Probable generation of surplus revenues over costs to the city of Novato.

h. Public Services/Utilities.

- Increased consumption of gas, electricity and water.

- Increased wastewater generation.

- Increased need for police and fire services.

i. Community Cohesion.

- Provision of a regional shopping center for area residents.

- Potential adverse economic impact on business in the downtown commercial area.

9. Purpose Of and Need for the Proposal. The purpose of the proposal to fill approximately 56 acres, in conjunction with the use of an adjacent filled area, is to develop a regional shopping center on approximately 77 acres. The regional shopping center would consist of an enclosed mall with four major stores and many smaller stores. Market analysis studies have indicated that at the time the proposed regional shopping center opened in 1982 there would be adequate market potential and sufficient major department store tenants to ensure market feasibility.

NOVATO CENTER
MARIN COUNTY, CALIFORNIA
REGULATORY PERMIT APPLICATION

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1.00 INTRODUCTION

1.01 Novato Center, Inc., Richard Hanna, President, 1290 Howard Avenue, Burlingame, California 94010, has applied for a Department of the Army Permit (Application and Public Notice No. 10138-33, Appendix B, Documents B-1, B-2) to:

- retain 9,500 cubic yards of unauthorized fill placed previously on 12 acres of historic wetland;

- place 350,000 to 400,000 cubic yards of additional fill material on 48 acres of historic restorable wetland and upon eight acres of existing brackish marsh;

- excavate approximately 390,000 cubic yards of material for fill from historic tidelands on an adjacent property creating a 37-acre lake;

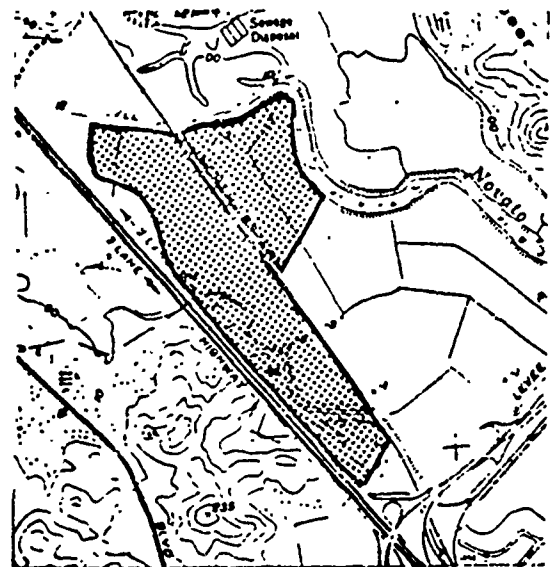
- place approximately 390,000 cubic yards of additional fill material on the site to be supplied from off-site quarries.

The subject property is known locally as Hanna Ranch, and is located in the city of Novato, California as indicated on Plate 1.

1.02 A portion of the 56 acres of former tidelands proposed to be filled and an adjacent filled portion of the Hanna property are proposed as the site for a 77 acre regional shopping center to be built, owned, and operated by Ernest W. Hahn Inc., of Hawthorne, California. Ernest W. Hahn Inc.'s, purchase of the site would be contingent upon the receipt of all necessary permits for development. No development plans have been submitted for the remainder of the area proposed to be filled.

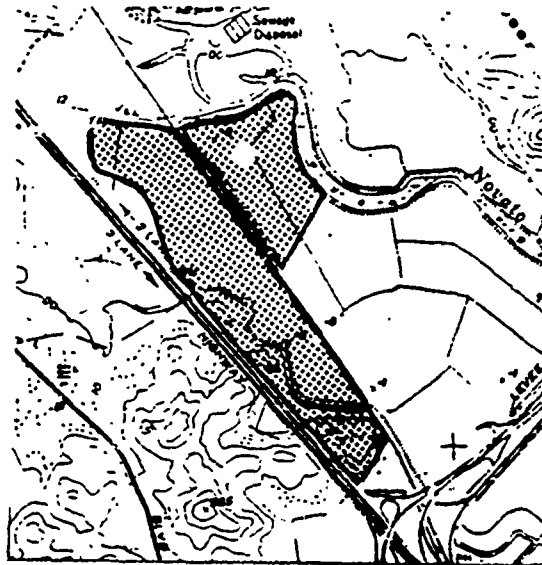
1.03 Alternatives. This Draft Environmental Statement will consider impacts expected from the proposed project and from four alternative proposals including alternative uses of the proposed site and an alternative location for a regional shopping center. These will be discussed throughout the text in the order presented below. Study areas are indicated on Plate 2.

1.04 Alternative #1. No project. This proposal will consider the effects of no additional fill or development on any portion of Study Area 1. The entire study area would remain in its existing undeveloped state for the foreseeable future.



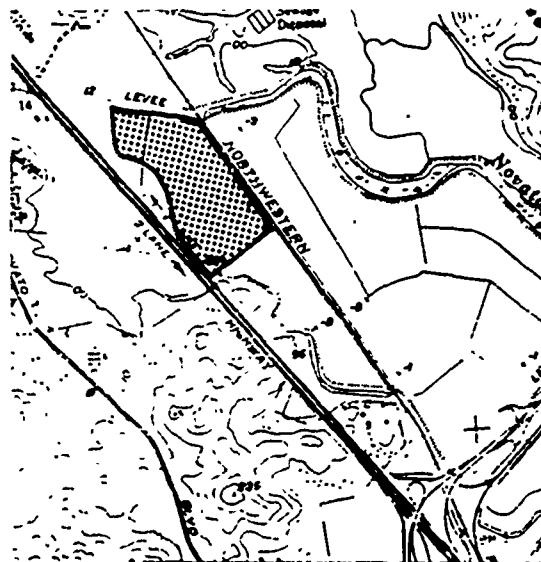
ALTERNATIVE # 1

1.05 Alternative #2. Proposed Project. This proposal will consider construction of a 77-acre regional shopping center (with about 986,000 square feet of leasable retail space) as proposed by Ernest W. Hahn Inc., including fill of the southern portion of Study Area 2 and excavation of 37 acres east of the railroad line to provide a portion of the needed fill material. A 37-acre lake would be created in the borrow area. This alternative would involve a change in zoning for the area south of Lynwood Slough from industrial to commercial. Plate 3 is a site plan for the proposed project.



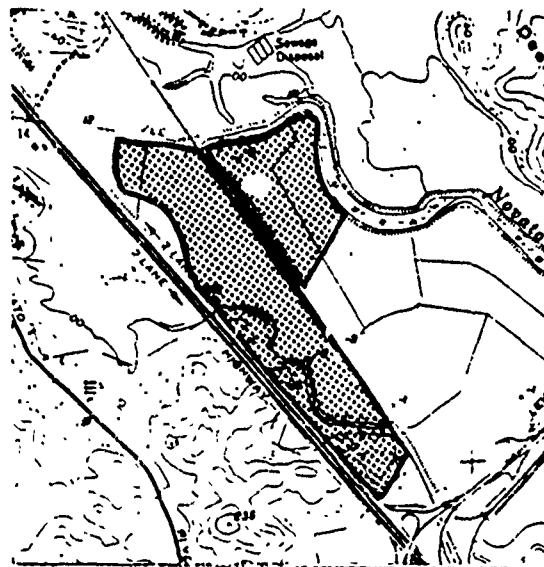
ALTERNATIVE # 2

1.06 Alternative #3. On-Site Project; Reduced Areal Coverage. This proposal will consider construction of a regional shopping center with 986,000 square feet of leasable retail space on the portion of the study area outside of Corps jurisdiction, 53 acres, north of Lynwood Slough. No further fill south of the slough and no excavation of material from the area east of the railroad tracks will be included in this alternative.



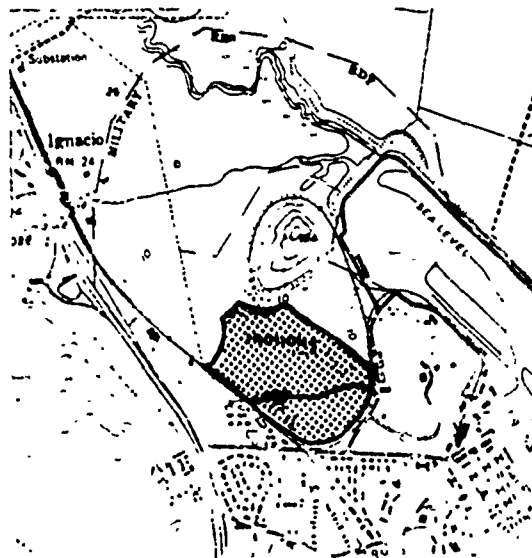
ALTERNATIVE # 3

1.07 Alternative #4. Development in Accordance with Current City Zoning. This alternative will consider development of a regional shopping center north of Lynwood Slough and industrial development on the 92 acres south of the slough (Study Area 4). This alternative would require fill south of the slough, and would probably include excavation east of the railroad to supply the fill material and creation of a lake, as in Alternative #2. Office and professional service use of the area north of Lynwood Slough would also be consistent with current city zoning, however these alternatives were not considered in this statement.



ALTERNATIVE # 4

1.08 Alternative #5. Hamilton Air Force Base. This alternative will consider the impacts of a proposed 77-acre shopping center located at Hamilton Air Force Base (Study Area 5). Most of the base has been determined to be surplus federal property and will be disposed of pending completion of a study (EIS) by the U. S. General Services Administration of potential uses.



ALTERNATIVE # 5

1.09 An additional alternative, construction of a regional shopping center in downtown Novato was considered initially, but rejected because of the lack of a developable land site large enough to accommodate the proposed project. The City of Novato's 1970 Downtown Plan and Program included a proposal for a City financed regional shopping center on the Pinheiro property at the corner of Redwood Boulevard and Olive Avenue.

This proposal is no longer considered feasible by the City due to the cost of property acquisition, relocation of existing housing and businesses, the need to construct a pedestrian way over Redwood Boulevard and the difficulty of financing the project after the passage of proposition 13 (a property-tax limitation measure).

1.10 Setting and Project History. The City of Novato is in Marin County about 29 miles north of San Francisco. Study Areas 1-4 (Plate 2) are located immediately east of the Rowland Boulevard freeway interchange on U. S. Highway 101. These Study Areas are bound on the north by Novato Creek. The eastern boundary for Study Areas 1 and 3 is the Northwestern Pacific Railway right-of-way. Study Areas 2 & 4 include a borrow area east of the railroad. The eastern boundary of the borrow area, as proposed, is Novato Creek.

1.11 The Hanna Ranch site consists of lowlands behind dikes. Fill has previously been placed over the 53 acres of the site north of Lynwood Slough. Of the former tideland south of Lynwood Slough, 48 acres are grassland and 8 acres are seasonal brackish marsh.

1.12 In 1973 a development proposal for the entire 454 acres of Hanna Ranch was submitted to the City of Novato. During review of the development plans the question of title to the lands arose with the State Lands Commission. In February 1977, the State Lands Commission and Novato Center Inc., consummated a title settlement and land exchange agreement in lieu of litigation. Of the 405-acre parcel in question, the State received title to 278 acres east of the Northwest Pacific Railroad right-of-way and Novato Center received title to 127 acres west of the railroad. Provisions were incorporated in the settlement agreement for excavation of up to 500,000 cubic yards of fill material by Novato Center Inc., from the "State Parcel." The excavation shall be conducted according to plans and specifications of the State. A copy of the title agreement is in Appendix B.

1.13 The Hamilton Air Force Base site (Alternative #5) is approximately 3 miles south of the Hanna ranch site, east of Highway 101. The Hamilton site consists of rolling hills descending to the bay plain and tidal marsh. Portions of the marsh have been filled for military aircraft use and structures have been built on much of the upland areas. The regional shopping center is proposed on an upland site.

1.14 The Air Force Base was decommissioned in 1974. The County of Marin made a formal application to GSA for acquisition of much of the property for a public airport with related land developed for commercial industrial uses, including a 77-acre regional shopping center. That application was withdrawn by the County in May 1979 because of the economic and environmental risks of an airport on the site. Under

Federal surplus property disposition laws, GSA can now sell the base to Marin County at a negotiated price for conveyance to a prospective developer or to the highest bidder. It is possible that if a Department of the Army permit to fill the Hanna Ranch site were denied, Novato Center Inc. could purchase property at Hamilton for development.

1.15 Authority. The Army's authority over the Hanna Ranch site (Study Areas 1-4) is based upon Section 10 of the River and Harbor Act (RHA) of 1899 (33 U.S.C. Sec. 403) and upon Section 404(b) of the Clean Water Act (33 U.S.C. Sec. 1344) which pertains to the discharge of dredged or fill material into the waters of the United States. In Leslie Salt Co. vs. Froehke, 578 F.2d 742, 753 (9th Cir. 1978), the court held that the Corps' jurisdiction under the RHA extends to all places covered by the ebb and flow of the tide to the mean high water (MHW) mark in its unobstructed, natural state, including diked areas below former MHW. Section 10 regulates any work done within this jurisdiction.

1.16 Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits, after notice and opportunity for public hearings, for the discharge of dredged or fill material at specified disposal sites into all waters of the United States, including adjacent wetlands, the degradation or destruction of which could affect interstate commerce.

1.17 At the Hanna Ranch site (Study Areas 1-4) Section 404 authority is claimed over the eight acres of brackish marsh of the old Lynwood Slough. Section 10 authority is claimed over the 56 acres of former tidelands south of Lynwood Slough, including the 8 acres of wetland and on the land east of the railroad proposed as a borrow area in Alternatives #2 and #4.

1.18 The Hamilton Air Force Base site considered under Alternative #5 is outside of Corps jurisdiction.

1.19 Purpose of Draft EIS. In response to the provisions of the National Environmental Policy Act of 1969, Public Law 91-190, 42 U.S.C. Sec. 4321 et seq., an evaluation of the impacts of the proposed activities on all aspects of the quality of the human environment is required prior to any permit application being considered for approval. This Environmental Statement addresses such an evaluation of the Novato Center Regional Shopping Center.

1.20 An important source of information for this Draft Environmental Statement was the "Novato Regional Shopping Center Draft Environmental Impact Report" prepared for the City of Novato (March 1979). The Draft EIR is incorporated by reference into this Environmental Statement. The City has to date not given approval for implementation of the Novato Center project and planning for various elements of the project are in preparation by the City at this time. A Corps permit cannot be issued until local authorization has been obtained.

1.21 An important source for information on the Regional Shopping Center proposed for Hamilton Air Force Base (Alternative #5) was the "Draft EIS on Disposition and Use of Federal Surplus Property on Hamilton Air Force Base" prepared by A. D. Little Inc., for the U. S. General Services Administration, April 1979.

1.22 Interrelationship and Compatibility of the Project with Existing or Proposed Corps and Other Federal Projects.

1.23 Novato Creek Flood Control Study. A report is currently being prepared by the Corps of Engineers on a study of flood control measures for Novato Creek. If implemented such measures will prevent flooding on the project site.

1.24 EIR/EIS on the Disposition of the Hamilton Air Force Base. On behalf of the General Services Administration, a draft EIR/EIS concerning the possible disposition (future use) of the Hamilton Air Force Base has been prepared. The draft considered the Marin County plan for the base (subsequently withdrawn) as well as industrial commercial development without an airport, residential use, and public use. A shopping center at Hamilton may be expected to provide significant competition to the proposed project, if both were built, which is highly unlikely.

1.25 Federal and State Policies and Regulatory Requirements.

1.26 Chief of Engineers Wetland Policy. This policy declares wetlands to be vital areas constituting productive and valuable public resources. Alteration or destruction of wetlands is discouraged as contrary to the public interest. Wetland functions considered important to the public interest are delineated in the July 19, 1977 Federal Register. Cumulative effects of small changes in wetlands often result in major wetlands impairment. Therefore, Federal projects affecting a particular wetland site and federally permitted projects will be evaluated with respect to the complete and interrelated wetland area. (A wetland evaluation of this project is presented in Appendix D.) No construction activity will occur in wetlands delineated as important to the public interest, unless the District Engineer concludes the benefits of the alteration outweigh the damage to the wetlands and the alteration is necessary to realize the benefits. The District Engineer must demonstrate the need to locate the project in the wetland and must evaluate the availability of feasible alternative sites.

1.27 Executive Order 11988, Floodplain Management. This policy states that Federal agencies must "avoid long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct or indirect support of flood plain development wherever there is a practicable alternative..."

1.28 Federal Aviation Administration. Because of the proximity of the Hanna Ranch site to Hamilton AFB, the project applicant must submit a Notice of Proposed Construction or Alteration to FAA prior to project construction. An aeronautical study of detailed plans of the development is then made to determine its impact on airport hazard. These requirements may change pending ultimate disposition of Hamilton AFB as discussed on page 4.

1.29 State of California Wetland Policy. This policy recognizes the value of marshlands and other wetlands. Basically, the Resources Agency and its various departments will not authorize or approve projects that fill or otherwise harm or destroy coastal, estuarine, or inland wetlands. Exceptions may be granted if all the following conditions are met: (1) project is water dependent; (2) no feasible, less environmentally damaging alternative is available; (3) the public trust is not adversely affected; and (4) adequate compensation is part of the project. Compensation measures must be in writing and long-term "wetlands habitat value" of involved project and mitigation lands must not be less after project completion.

1.30 In a 23 August 1978 letter to the Corps (Document B-4 Appendix B) the State Resources Agency indicated that "a negotiated written agreement was reached between the applicant and the State, prior to the development of the State's Wetland Policy, and as a result the State does not object to your issuance of the subject permit." The agreement is described in paragraph 1.12.

1.31 Additional State Requirements.

- The proposal to fill Lynwood Slough would require a streambed alteration permit from the Department of Fish and Game.

- The Regional Water Quality Control Board will require certification of the project.

- The proposed extension of Rowland Boulevard is within the U.S. Highway 101 right-of-way and will require an encroachment permit from the California Department of Transportation. Preliminary negotiations are now underway between the applicant and CALTRANS.

2.000 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

2.001 GEOLOGY/SEISMICITY

2.002 Present Conditions.

2.003 General. Hanna Ranch (Study Areas #1-4) and Hamilton Air Force Base (Study Area #5) are located approximately three miles apart and as such are included in similar geological environments. Both sites are underlain by Quaternary Bay and marshland deposits and alluvium, all of which overlie Franciscan rocks located at varying depths. Locally, these rocks, as well as geologic structures, are concealed by a thick sequence of alluvial sediments, which are of both marine and continental origin. A large portion of the young overlying sediments are derived from nearby hills and valleys. The youngest sedimentary deposits occurring in the area are found on the flat bay plains in the southeastern part of the Novato area. These deposits are former marshlands which consist of relatively soft, unconsolidated silty sands, clays, and peats locally known as younger Bay Mud. The Bay Muds within the general area occupy the flood plain of Novato Creek and other adjacent natural drainage systems. Recent surficial deposits consist of stream sediments and artificial fills.

2.004 The San Francisco Bay Area is located in a seismically active region. The seismic activity is well documented historically and occurs as individual sudden movements on faults resulting in earthquakes and also as fault creep. The strongest seismic intensity experienced in the vicinity of the study areas from any of these faults was a X (Modified Mercalli) during the 1906 San Andreas event. Three major fault zones are located within the bay area: the San Andreas Fault west of San Francisco Bay, the Hayward Fault at the western base of the Berkeley Hills, and the Calaveras Fault along the east side of the Berkeley Hills. All are active and considered a part of the San Andreas Fault system. All the study areas lie within this fault system (Plate 10), with the San Andreas Fault located about 14 miles to the southwest, and the Hayward and Calaveras Faults located approximately 10 and 35 miles to the southeast, respectively. Other faults in the region that are considered to have been active during Quaternary time include the Burdell Mountain fault, whose mapped location is shown slightly to the northeast of the study areas, and the Tolay and Rogers Creek Faults about 6 and 7.5 miles to the northeast, respectively. The only known active faults near the study areas are those within the Burdell Mountain Fault Zone, a geologically young fault zone occurring northeast of the Hanna Ranch Site. This zone constitutes the faulted contact between relatively young volcanic rocks of Tertiary age and the relatively old rocks of the Franciscan and the Novato Conglomerate formations, both of Mesozoic age. The only seismic indication of possible fault activity along the Burdell Mountain Fault Zone during recent time is the alignment of a few minor (less than magnitude 3) earthquake epicenters during the last 40 years (Rice, 1974).

However, this fault also has considerable geologic field evidence of younger sediment displacements, suggesting that it is an active fault. The traces of the individual faults within this zone can be readily located in some of the upland areas north of Novato, although extensions of these faults through the bay plains and marshland can only be projected from the upland areas (Rice, 1973). Two other faults have been mapped near the study areas. The inferred locations show the Novato Valley and Indian Valley faults as being near or under the northeast side of the Hanna Ranch site and slightly southwest of the Highway 101 Ignacio Interchange, respectively. However, the location of these faults is not conclusively known as both are covered with alluvium. Neither fault is considered to have been active during Quaternary time.

2.005 Other effects resulting from fault activity at both study areas include liquefaction and tsunamis. Liquefaction potential is generally highest in partially saturated or saturated cohesionless, fine-grained soils. Exploratory borings at the Hanna Ranch site indicate the presence of saturated sand lenses underlying portions of the project site (Cooper and Clarke, 1974). Such sand lenses may also occur at Hamilton Air Force Base (Rice, 1975). Soils boring data on adjacent sites confirms the great variability of the subsurface material in the region (Dames and Moore, 1961, and Cooper-Clarke, 1972).

2.006 Tsunamis are sea waves generated principally by seismic disturbances. Historically, the tsunamis that have reached the California coast have originated in areas around the Pacific such as Chile, Japan, the Aleutians, and Alaska and were caused by earthquakes in or near the ocean. California earthquakes have not generated any recorded tsunamis. The most recent tsunamis to strike the northern California coast occurred in 1960 and 1964 when tsunamis were generated by earthquakes with epicenters in Chile and Alaska, respectively.

2.007 A recent study (Department of the Army, 1975) indicates that a 100-year tsunami would have a runup in San Pablo Bay, adjacent to the two study areas, of 3.7 feet (mean sea level datum). A 500-year tsunami would have an estimated runup of 5.1 feet.

2.008 Mineral Resources. No significant mineral resources are located within the limits of the study areas.

2.009 Alternatives #1-4. The major portion of Study Areas 1-4 is relatively flat-lying. The surface slopes gently southward from a maximum elevation of 15 feet mean sea level (msl) to 5 feet msl except for the area south of Lynwood Slough where the lowest elevation is 1-2 feet below msl. Test borings indicate that the soft bay muds in the vicinity of the Hanna Ranch site are comprised of a thin, moderately firm upper crust (desiccation), underlain by up to 50 feet of relatively soft, unconsolidated, saturated silty clays and sands containing lenses of organic material. Borings in the northern part of the site revealed 17-34 feet

thicknesses of soft bay mud underlain by 16-28 feet in thickness of older alluvium. Bedrock was encountered at 51 and 61-foot depths (Goldman 1969, Cooper Clarke, 1976). These sediments increase in thickness to the northeast toward San Pablo Bay. Artificial fills have been placed over portions of the site and vary in thickness from 1-2 feet in the area 100-200 feet south of Lynwood Slough up to 8-10 feet in the extreme northern portion.

2.010 Alternative #5. Two geomorphic zones exist at Hamilton Air Force Base (HAFB). Low hills located along the westerly edge of the area mark the boundary between the bay plain and the Franciscan upland to the west. The proposed shopping center site is located on a relatively flat-lying portion of the bay plain near the separation of the bay plain - upland areas at about elevation 20 feet (msl). The site is underlain by alluvial deposits (of unknown thickness) comprised of variable accumulations of unconsolidated clay, silt, sand and gravel. The alluvium is underlain by soft bay muds (also of indeterminate thickness) consisting of unconsolidated, saturated silty clays and lenses of sand and peat. Older alluvium may underlie bay mud in some areas. Bay muds at the HAFB have been estimated to be 60 feet thick (Treasher, 1963) and 100 feet thick (Rice, 1975). Investigations will be required to delineate the areal distribution and classification of the sediments underlying the site before any building permits can be issued.

2.011 Impacts.

2.012 Seismicity. Seismic activity is continuing so it can be expected that the study areas will be periodically subjected to varying intensities of shaking as a result of earthquakes originating along the active fault systems within the Bay Area. Strong motion can be expected at the study areas, from large magnitude earthquakes. Ground motion during earthquakes may cause embankment or slope spreading and, in some cases, overall slope failures. Based on the effects of ground motions induced by past earthquakes on materials similar to those underlying the study areas, localized ground failure in the form of lurching, cracking or subsidence near channels or sloughs may occur. In general, ground shaking during earthquakes tends to be more severe in typical filled marshland areas than in firmer soil areas. There are no known active earthquake faults directly beneath the study areas that would present the risk of surface rupture.

2.013 Liquefaction. The presence of saturated sand lenses at the Hanna Ranch site (Study Areas #1-4) presents the potential for liquefaction in parts of the site. The presence and areal distribution of soil horizons with the potential for liquefaction or the absence of such layers is not well defined for the project sites. However, soils boring data on adjacent sites indicates a great variability of subsurface material (Dames and Moore, 1961 and Cooper-Clarke, 1972). Detailed investigations will

be required prior to final design of structures in order to delineate areas with liquefaction potential. Abundant evidence from many great earthquakes throughout the world has shown that damage to buildings and utilities tends to be considerably greater when they are located in deep, loose, compressible deposits such as soft Bay Mud, than when they are on hard bedrock sites (Rice, 1973).

2.014 Tsunami Potential. The Hanna Ranch site is protected by levees with a low point of approximately 6.5 feet in elevation (msl). The Hamilton Air Force Base site (Study Area #5) is about elevation 20 feet (msl). The estimated runup of a 100-year tsunami is 3.7 feet, and the estimated runup of a 500-year tsunami is 5.1 feet (Department of the Army, 1975). Therefore, there should not be any adverse impacts from tsunami runup.

2.015 Settlement. The bay sediments underlying the project sites consist of soft, highly compressible, unconsolidated, saturated, silty clays and sands containing organic material. Sustained loading by artificial fill material and man-made structures will cause substantial long-term settlement of these features. Differential settlement may result from the variable thickness of the Bay Mud as well as variations of the soil conditions, original and present topography, construction procedures and method of loading.

2.016 HYDROLOGY ^{1/}

2.017 Present Conditions.

2.018 Alternatives #1-4. The existing hydrologic setting of the project site is substantially different from the natural hydrologic conditions that existed before the Novato area was settled and developed. The area has been transformed from natural marshland where floodwaters from the surrounding watershed had little hydrologic effect to dry land where local runoff and, in particular, floodwaters from Novato Creek are a major constraint on development.

2.019 The local watershed of Lynwood Slough has been extensively urbanized in the last few years. Scottsdale Pond has been constructed in the low lying area immediately to the west of the freeway and acts as a retention basin for flood waters from the immediate watershed.

2.020 The Hanna Ranch itself is now also used as a flood storage basin for floodwaters from the Novato Creek watershed. The maximum level to which water can be ponded is approximately 7 feet msl, just slightly above the lowest weir in the south bank of Novato Creek. During construction of the U. S. 101 freeway, fill was taken from an area on the east side of the railroad tracks creating two ponds which act as retention ponds for the new Lynwood Slough pump station.

2.021 The flooding potential on the project site is determined by three causes, high tides, local runoff, and Novato Creek overflow. Plate 4, from a study by the U.S. Department of Housing and Urban Development, shows the potential area of inundation from the 100-year flood from these three causes acting independently or in combination. The flood elevation on site is determined to be 7.0 feet msl.

2.022 High Tides. If tides exceed 6.5 feet, flooding would occur in the project area to the south of the new Lynwood Slough channel to depths of 8 feet and up to 4 feet deep on the southern end of the area that has already been filled.

2.023 At this time, there has been no technical evaluation of the strength of the Novato Creek levees. However, it appears that because of their age, settlement, and probable method of construction, they have a high potential risk of failure during flood conditions and/or high tides.

^{1/} The Hydrology discussion for the alternatives at the Hanna Ranch site is adapted from a report prepared by Dr. Philip B. Williams, P. E., for Environmental Impact Planning Corporation (November 1978).

2.024 Local Runoff. Intense rainstorms in the upper part of the watershed could cause large flood flows into Scottsdale Pond (457 cfs for a 50-year flood, Novato Planning Department, 1974). This 10-acre pond has an outlet weir at elevation +3 feet msl and would discharge floodwaters into the downstream section of Lynwood Slough without causing inundation of property upstream. Local runoff would flow down Lynwood Slough into the existing retention ponds or if the runoff was of sufficient magnitude, into the low lying areas throughout the Hanna Ranch. It would then be pumped into Novato Creek. Within the approximately 340 acres of low lying land on the Hanna Ranch (including the state owned portion), there is sufficient storage to accumulate all the runoff from the 100-year storm in the local watershed with only a few feet rise in water surface elevation. Should the Lynwood Slough pumps be inoperable for any reason, only the southern part of the project site would be inundated by shallow flooding.

2.025 Flooding from Novato Creek. The major flood problem on the Hanna Ranch is caused by overflow from Novato Creek. The Novato Creek watershed at the U. S. 101 bridge is approximately 25 square miles and rises to elevations of 1900 feet. Whenever there is a period of precipitation followed by an intense rainstorm, flood conditions can result. In its natural state, the creek overtops its bank once every ten years in the lower reaches causing shallow overbank flooding. It was not until these flood plain areas were developed and floodflows obstructed by embankments and bridges that significant flood damages started to occur in the last 40 years.

2.026 The project site west of the railroad provides approximately 450 acre-feet of storage, reducing the frequency of flooding around Scottsdale Pond, and reducing flood elevations in the reach of Novato Creek between the northwestern Pacific Railroad bridge and the Redwood Boulevard bridge.

2.027 The Corps of Engineers and Marin County Department of Public Works are currently studying the channelization of Novato and Warner Creeks to reduce flood damage. If structural flood control measures are undertaken for Novato Creek, the potential for on-site flooding will be reduced. However, the risk of flooding from high tides will remain.

2.028 Alternative #5. Hamilton Air Force Base is in the Novato Creek watershed which encompasses the sub-watersheds of Arroyo-San Jose Creek and Pacheco Creek. Both Pacheco and Arroyo-San Jose Creeks flow into a ponding area at the north-westerly end of the base. The ponding area is thought to have a capacity of about 600 acre-feet when the water level is six feet above mean sea level.

2.029 Much of the runoff from Pacheco Creek enters HAFB at the southwest end of the base and is conveyed through a system of subsurface culverts into the ponding area. Recent development upsteam has increased the

flooding potential from Pacheco Creek to the potential regional shopping center site. Low lying areas of the study site could be flooded by a 10-year storm from both Pacheco Creek and the Arroyo San Jose ponding area. The 100-year floodplain is indicated on Plate 5.

2.030 Impacts.

2.031 Alternative #1. If increased urbanization occurs in the Novato Creek watershed increasing surface runoff, the flooding risk to the site will increase. If built, the proposed flood control improvements would reduce flooding on-site.

2.032 Alternative #2. This alternative would impact the existing on-site drainage system, on-site flooding and flood damage in surrounding areas, by reducing ponding capacity and increasing on-site surface runoff.

2.033 Drainage System. Filling of the southern half of the site would eliminate the remnant of the Lynwood Slough channel. Local drainage from the 70 acre area to the west of the freeway would be diverted into the new Lynwood channel and the Cheda Creek drainage through storm sewers. The new channel of Lynwood Slough would follow the same alignment but pass through a large 20' x 6' culvert to daylight just to the west of the railroad tracks. Water would then flow through the existing and additional 60" culverts into the enlarged lake on the other side. Placement of fill between the railroad and Highway 101 could cause increased flood depths upstream of the highway if a flood way for water overflowing Novato Creek is not provided through the project. Therefore, a second large 20' x 6' culvert would be constructed to drain Novato Creek floodwaters from the low lying area at the Rowland Boulevard interchange to the west side of the railroad tracks. Additional 60" culverts would be placed through the railroad embankment to discharge directly into the lake.

2.034 Runoff from the site would drain towards the east and be collected in a drainage channel on the east side of the railroad tracks before discharging into the lake.

2.035 The lake itself would act as a retention pond and sump for the existing pump station. It would be excavated to approximately -12 feet msl and water levels would be maintained to approximately -5 feet msl by the pumps. This would require readjustment of the existing pumps operational controls. Water would be provided to the lake from the stormwater runoff and seepage of salt water through the Novato Creek levees. Since evaporation from the pond could be in the range of 100-150 acre-feet/year during the summer and fall and since Scottsdale Pond intercepts most of the surface runoff upstream, during this part of the year, water levels in the lake would probably decline and the water would become more brackish. In the winter and spring, the lake would be full and contain fresh water runoff.

2.036 Flooding on Site. The development structures would be constructed on fill at an elevation of +8 to +9 feet msl and would not be subject to inundation from the 100-year tide or flood from Novato Creek except in the circumstances described below. Parking areas would be constructed at elevations of +6 to +7 feet msl and could be subject to shallow flooding by extremely high tides should the Novato Creek levees fail. More significantly, if during a large flood on Novato Creek, the two culverts crossing the site were obstructed by debris, or their flow capacity reduced by high water levels on the Hanna Ranch retention area, large floodflows could occur across the site. These flows would be diverted around the north edge of the buildings to flow over the northern parking area towards the east. This parking area is approximately 400 feet wide and depending on the detailed design of its slope, geometry and nature of obstructions, may not be able to pass the 100-year flow of 2000 cfs without damage to adjacent structures.

2.037 Should for any reason the Lynwood Slough pumps be inoperative or should two very large storms occur within a short period before the retention basin can be pumped out, or if a 100-year flood or larger occurs, the basin could completely fill and water levels could rise to approximately 8 feet (msl). This would inundate the proposed parking areas to depth of 1 or 2 feet.

2.038 Effects on Flooding In Adjacent Areas. The project site is located on fill placed directly across the path of most of the floodwater overflowing from Novato Creek. However, the 101 freeway embankment already provides a substantial obstruction to the passage of floodwaters from the Scottsdale Pond area. Water leaves the Scottsdale Pond either by overtopping the freeway or through the Lynwood Slough culvert.

2.039 Provided outflows over the freeway are not impeded, nor outflows from the culvert obstructed, there would be little effect on water levels in Scottsdale Pond. With the proposed drainage system design concept, water flowing over the freeway would pond in the interchange area (elevation +4 feet msl), would collect in the two 20' x 6' culverts passing under the site, and would then discharge into the retention area to the east of the railroad line. Normally this system would not impede the weir flow over the freeway until water levels in the state owned parcel had backed up sufficiently to substantially reduce the outflow capacity of the two culverts. When this occurs, the 10' x 6' Scottsdale Pond outlet culvert capacity would also be reduced.

2.040 Backing up of water in the outlet occurs under existing conditions. With the proposed project, the installation of additional culverts and the raising of ground elevations on the site could increase the obstruction of weir flow and reduction of Scottsdale Pond outflow during large floods. However, the most significant impact on Scottsdale Pond water levels would be due to the placement of fill in what was formerly part of the retention area of the Hanna Ranch.

2.041 The proposed project would reduce the total retention storage between the elevations of -1 and +7 msl feet by approximately 350 acre-feet. Four hundred and fifty acre-feet would be filled on the site, but excavation of the 37-acre lake to a water surface elevation of -5 feet msl would provide an additional 100 acre-feet.

2.042 No flood routing analysis has been done at this stage in the design process to determine the water levels on the Hanna Ranch which would cause increases in flood elevations in the Scottsdale area. However, it appears that the reduction in storage capacity would cause a small increase in frequency of flooding in this area and at the Rowland Boulevard interchange and would also cause a small increase in flood depths during very large floods.

2.043 In the proposed drainage design concept, the existing low point on the south bank levee just upstream of the railroad bridge would be retained to allow for relief of backwater ponding behind the Redwood Boulevard bridge. Reduction in the total storage volume of the Hanna Ranch by 350 acre-feet would reduce this capability by a small degree.

2.044 Reduction of storage volume on the project site and increased local runoff would also reduce the effectiveness of the downstream flood-water storage areas on Novato and Cheda Creeks to lower flood elevations upstream, and increase flooding problems near State Highway 37. The above would especially be so if in the future the capacity of the upstream channel is enlarged. Overflow across Highway 37 would have occurred about once every 70 years under existing conditions. Under conditions after completion of the proposed project, storage would be reduced to the point where some water could back up across Highway 101 and the frequency of flooding across Highway 37 would increase to once every 30 years.

2.045 Alternative #3. Detailed plans for this alternative have not been made, so it is assumed that the hydrologic design of the developed area north of Lynwood Slough would be the same as for Alternative #2. The area south of the slough, would not be filled. This area would continue to collect floodwater from high tides, local runoff and Novato Creek. This alternative would not decrease the flood storage capacity of the site to the same extent as Alternative #2.

2.046 Alternative #4. Although detailed plans have not been worked out for this alternative, it is assumed that the hydrological impacts will be similar to Alternative #2.

2.047 Alternative #5. Specific plans have not been developed for this alternative. It is assumed that flood protection would be provided by filling of the low portions of the site to an elevation above the flood plain. Pacheco Creek may be channelized and the underground drainage system may be enlarged.

2.048 Mitigation.

2.049 Alternative #2. Suggested mitigation.

a. To maintain stable lake levels throughout the summer and fall, a supplementary water supply should be provided. The most suitable source may be reclaimed wastewater from the Novato wastewater treatment plant on the north side of Novato Creek.

b. The culverts through the site should be designed to convey at least the 100-year flood overflow from Novato Creek.

c. Inlets to the culverts should be designed with flared wing walls and debris screens to minimize flow obstruction.

d. The parking area on the north side of the project site should be designed to convey 100-year floodflows without damage to adjacent structures.

e. The channel on the east side of the railroad embankment should be designed to convey overflow from the railroad bridge backwater pond without causing damage to the railroad.

f. Building pads on site should be elevated above the maximum water surface level of the retention pond.

g. In the design of the drainage system, a flood routing analysis should be done to determine actual maximum surface elevations on the Hanna Ranch, increases in water surface elevations in the Scottsdale Pond area during the 100-year flood, and increases in frequency of flooding from smaller floods due to loss of retention volume.

h. If such an analysis shows it to be necessary, additional pumping capacity should be installed at the Lynwood Slough pump station to control water surface elevations to existing levels. To compensate for the loss of 350 acre-feet of storage, pumping capacity of approximately 120 acre-feet/day (61 cfs) should be installed to maintain the 100-year flood ponding at existing levels (assuming a 72-hour flood hydrograph for the 100-year flood).

2.050 An alternative approach to flood protection for the site would be to increase channel capacity of Novato Creek upstream of U. S. Highway 101 to prevent overflow into the project site. Such an approach would eliminate the need for large culverts through the site, but would still require building pad elevations to a minimum of 8 feet to provide protection against extremely high tides. Under this alternative, flood protection would be provided for the whole area south of Novato Creek.

2.051 Alternative #3. Same as Alternative #2, measures b-h.

2.052 Alternative #4. Same as Alternative #2.

2.053 WATER QUALITY

2.054 Present Conditions.

2.055 Alternatives #1-4. Water quality on the project site is variable and is dependent on the intensity and duration of rain, and the quantity and nature of stormwater runoff. Although the Old Lynwood Slough now holds only local runoff, the water is of sufficient quality to support freshwater habitat for wildlife. The realigned Lynwood Slough accepts most local drainage from the site. It is full during the winter, and holds isolated stagnant ponded water during periods of dry weather. The water quality in the slough is generally poor and low in dissolved oxygen (DO) due to limited mixing. This water becomes degraded by the addition of salt from leaching of the inherently salty soils, by concentration from evaporation, and by a rise in temperature (which reduces oxygen levels). Water quality in the holding ponds is similar to that of Lynwood Slough, and seems to be of sufficient quality to support an invetebrate population and to provide waterfowl habitat (Harvey, 1978).

2.056 During storms in the winter and early spring, early runoff from the watershed is degraded by urban contaminants washed from paved surfaces. In time, these contaminants become diluted, thus improving the quality of water in later runoff, and improving the quality of wildlife habitat. Runoff from the site also adversely effects water quality by increasing turbidity.

2.057 No information exists on the water quality of Novato Creek. Novato Creek has not been subjected to sewage flows since the installment of the Novato Sanitary District's outfall in San Pablo Bay, but is subjected to contaminants found in stormwater runoffs. Novato Creek is subjected to tidal action which helps to maintain good water quality through mixing and dilution.

2.058 Potential beneficial uses of Novato Creek include contact and non-contact water recreation, warm and coldwater habitat, and fish migration and spawning. Novato Creek currently provides a water supply and vegetative habitat for the maintenance of wildlife.

2.059 Although there are areas of water stagnation on site, the Marin-Sonoma Mosquito Abatement District does not spray or experience any problems with mosquito control on the site (E.I.P., 1979).

2.060 Alternative #5. The Pacheco Creek watershed is the only area of Hamilton Air Force Base drainage that is mixed with off-base drainage. As the watershed is being developed, it is assumed that the runoff contains contaminants from street runoff, animal wastes, oil, fertilizer and litter. There are no significant sources of contaminants on the project site.

2.061 Impacts

2.062 Alternative #1. No change.

2.063 Alternative #2. Construction of the proposed project would effect on-site water quality. The culverting of Old Lynwood Slough and Lynwood Slough is expected to reduce local stagnation in these areas, and is not expected to change the quality of stormwater runoff that is discharged through it. Elimination of stagnated areas would reduce the potential for mosquito breeding.

2.064 The higher runoff rates generated by the increase in impervious surfaces on site (parking lots and buildings) would carry impurities originating from litter, automobiles, fertilizers, pesticides, and animal wastes.

2.065 Pollutant concentrations in runoff depends upon the type of pollution that collect on paved surfaces, frequency of street-cleaning, and magnitude and timing of storms.

2.066 Although detailed drainage plans are not available for the project, it is likely that the surface runoff from the site would ultimately be discharged to the proposed lake created by the excavation of fill for the proposed project.

2.067 Storm runoff collected in the proposed lake would take limited advantage of the natural cleansing capacity of proposed wetland vegetation. Pollutant waste can be decomposed and dispersed provided that (1) the system is not also stressed by poisons (insecticides, acids, etc.) and that (2) the rate of input is controlled at low to moderate levels and not subjected to sudden "shocks". It must be recognized that impounded waters do not have nearly the natural capacity for waste treatment than those waters subject to tidal action.

2.068 Alternative #3. The impacts of this alternative would be similar to the impacts of Alternative #2 discussed above except that the reduced size of the project would result in a proportionate decrease in surface runoff and a corresponding decrease in contaminants entering the two existing ponds on the east side of the railroad.

2.069 A lake with wetland vegetation will not be created as part of this alternative, so wetland vegetation will not be available to improve water quality.

2.070 Alternative #4. Same as Alternative #2 except there may be some additional pollutants entering the water system due to the presence of light industry on the site.

2.071 Alternative #5. This alternative will increase the amount of impervious surface on the site thus increasing runoff. Litter, waste, oil and fertilizer in the parking areas may be washed into Pacheco Creek. The severity of the impact will depend upon storm frequency and magnitude, and the frequency of street cleaning.

2.072 Mitigation.

2.073 Alternative #2. Proposed Mitigation. The lake and quality of the discharge to Novato Creek would need to meet requirements of the Regional Water Quality Board. General requirements relate to conditions for circulation, the control of excess algae growth, and the outline of requirement for discharge into Novato Creek.

2.074 The Department of Fish and Game has already acquired a 66 year lease for the 278-acre area owned by the State Lands Commission. If constructed, the proposed lake will be managed in conjunction with the present management plan of the San Pablo Bay State Wildlife Area.

2.075 Suggested Mitigation.

- a. Control of littering and dogs.
- b. Provision of frequent street sweeping (conducted more frequently during the rainy season).
- c. Frequent cleaning of catch basins.
- d. Regulation of construction schedules.
- e. Stabilize exposed areas of lake through seeding or planting of vegetation to minimize turbidity.
- f. Control of erosion at construction site.
- g. Reseeding or application of vegetation to disturbed areas.
- h. Reduce volume of runoff by maintaining pervious open space areas and construction of detention and storage basins. If water were stored on the roofs of structures it could be used for irrigation without the need for mechanical pumping. If the roof runoff is not stored, it should be discharged directly to the drainage system, not merely allowed to run onto the parking lots. In addition, surface to subsurface storage basins could be constructed to catch the first flush of runoff, which contains most of the pollutants. This water could either be used to irrigate planted areas or discharged after sufficient time has elapsed to allow pollutants to settle out.

i. Construct detention and storage basins to catch the first flush of runoff which contains most of the pollutants. This water could be discharged after sufficient time has elapsed to allow pollutants to settle out.

2.076 Alternative #3. Same as Alternative #2.

2.077 Alternative #4. Same as Alternative #2. The presence of industry may require additional safeguards against accidental spills of toxic substances and/or limitations upon the kind of establishments which could locate on the site.

2.078 Alternative #5. Same as mitigation suggested for Alternative #2.

2.079 VEGETATION AND WILDLIFE

2.080 Present Conditions.

2.081 Alternatives #1-4. Historically, most of Study Areas #1-4 were part of the San Francisco Bay estuarine complex. The flatland that abutted upon the low hills around San Pablo Bay was covered with marsh vegetation and interspersed by many meandering sloughs. Lynwood Slough was one of the these many sloughs that drained the extensive marshlands. At one time over 300 square miles of such habitat existed around the Bay. Now less than 60 square miles of tidal marshland remain.

2.082 The high productivity of the former marshland that dominated the site undoubtedly supported a rich wildlife assemblage. Little remains of these productive wetlands today. Only the remnants of Lynwood Slough have enough water to sustain life forms and numbers indicative of former wildlife uses.

2.083 All of the study area has been diked off from tidal action and much of the northern portion has had fill deposited on it. The diking has prevented tidal inundation so that water accumulates only after winter rains. At the higher elevations plants adapted to dry conditions survive, while freshwater marsh vegetation grows in the old slough bottom. The deposition of fill has had a major impact by destroying the original vegetation and raising the surface above current ground water levels.

2.084 The U.S. Fish and Wildlife Service has contracted to have a report prepared to describe and quantify some of the ecological values of the wetland area. The entire report is included in this ES as Appendix E. The following is the summary from that report.

2.085 "The 9-acre Lynwood Slough is a wetland with standing water during winter, spring and summer. Cat-tail and tule are the dominant emergent vegetation in the freshwater slough. At least 49 species of birds, 13 species of mammals, 2 species of reptiles, and 2 species of amphibians were found in the slough or along its borders between November 1978 and May 1979. Standing water was the primary factor attracting six species of aquatic birds to the area, and aquatic vegetation the factor attracting one other species. Ten species of birds were associated with trees bordering the slough. Twenty-nine species of birds occurred on two oak knolls that lay adjacent to the slough. The air space over the slough was utilized by four species of aerial foragers. Aquatic bird use of the area would probably have been greater if there had been a significant amount of standing water year round."

2.086 Vegetation. The project site was surveyed by Harvey & Stanley Associates, Ecological Consultants in Fall 1978. The study divided the project site into five areas referred to as the Fill Area, Lynwood Slough Area, Lake Area, Field Area and Oak Area. The locations of these areas are indicated on Plate 6. A list of the species observed is included in Appendix C. The results of the survey are summarized below.

a. The Fill Area consists almost entirely of annual weed species of non-native plants. Common members of this ruderal community are Australian saltbrush, wild oats, horseweed and rabbit's foot grass. In general, the cover is relatively sparse although there are apparent low areas where some dense growth occurs.

b. The Lynwood Slough Area was the least disturbed of the areas surveyed. The old slough course and the new channel provide a wetland habitat for various native plants. The native species include coyote brush, cattails, saltgrass, arroyo willow, brass buttons and alkali bulrush. The native species are joined by non-natives such as wild radish, yellow star thistle and perennial rye grass.

c. The Lake Area is also a disturbed area as some of the substrate has been removed and the area is diked off from tidal action. It is very sparsely covered with weedy species of plants, many of which are the same as those on the Fill Area. In addition to the ones listed above, there are individuals of hayfield tarweed, pampas grass, telegraph weed, bristly ox-tongue and wild radish.

d. The Field Area appears to have been partially disturbed by fill and hay cultivation. The latter has resulted in the introduction of many weedy species. It is a relatively well-covered site by various ruderal plants, such as those listed for the previously mentioned areas. In addition to the thistles and wild radish, etc., there are specimens of Italian ryegrass and perennial ryegrass in the Field Area.

e. The Oak Area consists of the remnants of the foothills that project into the former marshland. The vegetation cover is an oak savannah. Specifically, the oaks are live oak, blue oak, black oak and valley oak. The ground cover consists primarily of introduced weedy species. Common representatives are slender wild oats, Canada thistle, wild radish and milk thistle.

2.087 Wildlife. Each of the Areas described above were surveyed for wildlife habitat by Harvey & Stanley Associates. A procedure adopted from the U.S. Fish & Wildlife Service Habitat Evaluation was used to rank each of the areas for wildlife use. A listing of the animal species observed is presented in Appendix C.

a. The Fill Area overall would rank low for wildlife use. The sparseness of vegetation makes it a marginal habitat because of the relatively little food available and the lack of cover.

b. The Lynwood Slough Area was the richest area from a vegetation standpoint and rated high in wildlife use. The presence of marsh vegetation, the proximity of diverse habitats, and the scarcity of freshwater marshes around the Bay Area contribute to the high value of this area for migratory and resident birds.

c. The Lake Area was low in wildlife use. The vegetative cover is less dense here than in the Fill Area making it less valuable for wildlife.

d. The Field Area was evaluated as of moderate wildlife use. The vegetative cover is more dense than the area discussed above and it is adjacent to a water source, Lynwood Slough, where dense cover exists.

e. The Oak Area is stratified which enhances wildlife use. The tree canopy and ground cover support a variety of wildlife species including jays and finches. This area was evaluated high for wildlife use.

f. The Pond Area, next to the Lake Area, was also evaluated because it would be affected if the lake were developed. This Area appears to have the highest wildlife use. The presence of year-round water supports various duck species and shorebirds.

2.088 Threatened and Endangered Species. It is highly probable that the original marshland on the site supported the now endangered species of salt marsh harvest mouse and California clapper rail. As the clapper rail depends upon tidal marsh for food, it is not likely that any now utilize the site. None have been observed on the site. It is unlikely that the salt marsh harvest mouse is present on the project site. Fifty trapping stations were set up on the site on four nights to capture the mouse. None were trapped. The U. S. Fish and Wildlife Service has been consulted on this issue, and they have reported that there are no listed threatened or endanger species at the project site. However, there are five plant species proposed for addition to the threatened and endangered species list that may be in the project vicinity. The comprehensive study of the project site by Harvey and Stanley Associates did not find any of the five proposed species on the project site. Because of the disturbed nature of the area their presence is highly unlikely. No impact is anticipated to any listed or proposed threatened or endangered species. This document will serve as the Biological Assessment required by Section 7 of the Endangered Species Act of 1973, as amended.

2.089 Alternative #5.

2.090 Vegetation. The Hamilton Air Force base has been intensively used for the last century. This activity has resulted in a relative scarcity of natural plant and animal habitat. Most of Study Area 5 is annual grassland. A 10-acre portion of the site along Pacheco Creek supports

riparian vegetation consisting of willows, acacia, blackberries, and associated plants. This riparian area has been reduced by the channelization of the creek. The southwestern portion of the site contains buildings and paved surfaces with little vegetation.

2.091 Wildlife. The developed area has the least value to wildlife. The grassland is of moderate value to rodents, small mammals and terrestrial birds. The most valuable area for wildlife and the most sensitive to disruption is along Pacheco Creek. Detailed wildlife studies have not been prepared for this site.

2.092 Threatened and Endangered Species. No rare and endangered species have been recorded in the Study Area, and the probability for their occurrence is low, due to long-term human use of most of the Study Area.

2.093 Impacts.

2.094 Alternative #1. No change.

2.095 Alternative #2. Due to the relatively sparse vegetation cover and lack of water, the development of the filled portion of the site (north of the new Lynwood Slough) would pose the least significant impacts to fish and wildlife. Development of the area south of Lynwood Slough will have a greater impact, as the remnants of the old Slough and the wetlands surrounding it would be destroyed, eliminating the existing aquatic and marsh habitat. Loss of this habitat without replacement would constitute a significant impact on wildlife. Concern for the loss of this resource has been expressed by government agencies and private environmental groups. The habitat along the re-aligned Lynwood Slough would also be destroyed. Project landscaping may provide some limited habitat for terrestrial animals.

2.096 The existing retention ponds on the east side of the railway, which presently support a variety of waterbirds and shorebirds would be altered. The lake proposed for this area may increase water-fowl habitat, and may supply freshwater marsh habitat depending upon its design. However, according to the U.S. Fish and Wildlife Service, the proposed lake "will be too deep and fluctuate too much to produce significant vegetation...The detention basin will never have the diversity of habitat which presently exists in and adjacent to (old) Lynwood Slough."

2.097 Agency Coordination. Among the agencies coordinating with the Corps on permit actions, those with particular expertise and responsibility for fish and wildlife are the U. S. Fish and Wildlife Service (FWS), National Oceanic and Atmospheric Administration (NOAA), and the California Department of Fish and Game (DFG). NOAA has indicated that they will reserve their comments on the proposed project pending preparation of this EIS. The Department of the Fish and Game would not object to the permit actions because it is the opinion of the State Resources

Agency that the title agreement described in paragraph 1.12 satisfies the State's interest in the property. The Fish and Wildlife Service has indicated that they will object to the issuance of the permit because a regional shopping center is not dependent upon location in a wetland, and Service policy and guidelines mandate opposition to nonwater-dependent fills in productive wetlands. For this reason the U.S. Fish and Wildlife Service will not consider any work on the State-owned land east of the railroad line as adequate mitigation for the proposed project.

2.098 Mitigation Suggested. Restoration of tidal marshland would be the most appropriate mitigation since the study area was once tidal marshland and of high wildlife use. Nearby lands to the east along Novato Creek also have the potential for such restoration mitigation. Two prime physical factors would have to be ascertained prior to specific siting of a restoration area.

2.099 First, tidal elevations on the land would have to be determined as marsh plants can only grow at certain elevations. The proposed lake northeast of the project site is not likely to produce much shoreline marsh as presently conceived. It is proposed to be excavated to -12 feet below existing ground level. This would put it about 10 feet below where marsh plants could grow if the lake were subject to tidal action. A lake with very gradual sloping sides, relatively shallow, and opened to tidal action would increase the surface exposed at low tide and thus increase the area where marsh plants could grow and where shorebirds could feed. More design study is needed in cooperation with fish and wildlife groups and agencies to make this available mitigation possibility practical.

2.100 The second siting factor would be appropriate dike construction. Dikes with a gentle slope toward the restored marsh are preferred for ecological reasons. Vegetation would extend over a greater area at the higher elevation which would in turn afford greater protection for wildlife at the higher tides and provide more feeding area.

2.101 Wildlife use in the compensation area can be increased by providing a diverse habitat. In addition to recreating only tidal marsh, it may be possible to provide wildlife species with marsh, mudflat and resting islands. The latter are of increasing importance around the Bay as human intrusion into wildlife areas increases. Islands provide retreats from people, and domestic predators.

2.102 The State Department of Fish and Game recommended the following compensation measures to assure maximum wildlife values from the proposed lake in connection with the title settlement and land exchange agreement described in paragraph 1.12.

a. That the shape of the pond be irregular with at least one peninsula extending approximately 1/4 of the way into the pond. This design will provide a greater amount of edge type habitat.

b. That the depth of the completed pond should be at least seven feet, to prevent tule and cattail growth and provide open water areas.

c. That the bank should have a slope of 6 to 1 for approximately 15 feet, then a 4 to 1 slope to the final depth. This slope will provide the proper water depths for desired vegetation growth along the edge of the pond.

d. That water control structures be installed. The inlet and outlet channels could be dug during the construction phase of the pond, with the control structures added and the levee breached at a later date to allow tidal action to occur. Construction of the inlet itself should be on the upstream portion of the pond, controlled by an adjustable board dam or other similar water control structure. The outlet should be on the downstream side of the pond controlled by a tide flap gate. Tidal fluctuation will expose portions of the bottom, creating additional habitat for a variety of species.

2.103 The study plan for marsh creation at the lake site should be designed to eliminate shallow standing water where mosquitoes would be likely to breed.

2.104 Mitigation Proposed. The applicant has proposed the following plan for the lake, and for returning the southern portion of the State-owned parcel to tidal action. Under the plan, which has been approved by the State Department of Fish and Game, the applicant would provide:

a. An irregularly shaped 37-acre lake with three islands and inlet and outlet control structures.

b. Water control devices (weirs) on Lynwood Slough near the railroad culverts and near the flood control pumps. The devices would provide a more constant water level in the proposed lake by allowing inflow and outflow during higher runoff flows in the channel and would hold the lake at a predetermined level after the channel had been drained by the pumps.

c. An inlet control structure and feeder ditch to control flow from Novato Creek into the southern portion of the State-owned parcel.

d. An outlet control structure to Novato Creek at the extreme southern end of the State-owned parcel.

e. A berm to separate the proposed lake from the area proposed for tidal marsh.

f. A ditch or fence to prevent access to the State-owned parcel.

2.105 Alternative #3. This alternative would destroy the sparse vegetation of the area north of Lynwood Slough which has already been disturbed. The loss of this habitat is not considered critical. The area south of Lynwood Slough, which is considered more important for wildlife, would remain in its present condition. Human intrusion into the area may increase. The ponds east of the railroad would not be impacted directly, however, the vegetation and wildlife may be impacted by any degradation of water quality produced by the proposed shopping center.

2.106 Alternative #4. Same as Alternative #2.

2.107 Alternative #5. The proposed project will destroy the existing vegetation and wildlife habitat. Project landscaping may provide limited habitat after project completion. No impact to any Rare or Endangered Species is anticipated.

2.108 Mitigation Suggested. Retention of the existing riparian habitat along Pacheco Creek.

2.109 TRAFFIC

2.110 Present Conditions.

2.111 Alternatives #1-4. Access to Study Areas 1-4 is provided by U.S. Route 101, State Route 37 and several local streets. Plate 9 shows existing evening peak hour and average daily directional traffic volumes for a typical Friday at all important points in the roadway network serving the study areas.

2.112 U.S. 101, which is adjacent to the western boundary of the proposed site, is the major route connecting the shopping center with the populated areas of Marin County and San Francisco to the south; and the cities of Petaluma and Santa Rosa in Sonoma County to the north. U.S. 101 is built to freeway standards and has three lanes in each direction in the general vicinity of the study areas (the freeway becomes four lanes in each direction at a point south of the City of San Rafael and two lanes in each direction north of Novato). Current commute patterns result in congestion on southbound U.S. 101 from southern Novato to San Rafael (including the portion of the highway near the study areas) during the morning peak travel period. Traffic volumes on U.S. 101 decline after the morning, and there are usually no significant traffic congestion problems in the proposed project vicinity during the evening peak period.

2.113 Situated to the south of the project site is State Route 37. State Route 37 is a four lane expressway (two-lanes in each direction) which connects the site with the cities of Napa and Vallejo, and other portions of Napa, Sonoma, and Solano Counties. The western terminus of State Route 37 is U.S. 101. Traffic volumes along State Route 37 are relatively light, and no peak period traffic congestion occurs in the vicinity of the study areas.

2.114 Access from the regional highway network to the site is provided by either the Rowland Boulevard interchange on U.S. 101 or the Marsh Road-Hanna Ranch Road interchange on State Route 37. The Rowland Boulevard interchange is situated at the northwestern corner of the site and is currently constructed in a "diamond" configuration. This existing ramp configuration operates well under the existing traffic conditions. To the south of the site, State Route 37 has an interchange with Marsh Road and Hanna Ranch Road. These two roads provide access to the existing properties situated directly south of study areas. Limited traffic travels along these two access roads. A single track of the Northwestern Pacific Railroad crosses Hanna Ranch Road at-grade west of Marsh Road.

2.115 Table 1 indicates the present levels of service on U.S. 101 and State Route 37 at peak hour traffic on a Friday afternoon in the vicinity of Study Areas 1-4.

TABLE 1

FRIDAY PM PEAK HOUR LEVEL OF FREEWAY SERVICE, 1977

<u>Road Segment</u>	<u>Direction</u>	<u>Level of Service*</u>
<u>U S. 101:</u>		
South of State Route 37	Northbound	D
	Southbound	B
Between SR 37 & Rowland Boulevard	Northbound	C-D
	Southbound	A-B
Between Rowland Boulevard & DeLong Avenue	Northbound	C
	Southbound	A
<u>State Route 37:</u>		
East of U.S. 101	Westbound	A
	Eastbound	A

*Level of freeway service interpretation (based on the National Academy of Sciences, Highway Capacity Manual):

- A: Excellent operation; unrestricted flow, speeds greater than 60 mph.
- B: Very good operation; speeds greater than 55 mph.
- C: Good operation; speeds greater than 50 mph.
- D: Fair operation; speeds greater than 40 mph.
- E: Poor operation; unstable flow, speeds about 30 mph.

Source: EIP, 1979.

2.116 The principal streets providing access to the site from the City of Novato and adjacent areas are: South Novato Boulevard; Redwood Boulevard; and Rowland Boulevard. South Novato Boulevard is a major north-south arterial through the City of Novato. Tentative plans have been proposed to widen South Novato Boulevard between Rowland Boulevard and Diablo Avenue, however, the program for this improvement has not been formalized.

2.117 The Redwood Boulevard is also a north-south roadway. Redwood Boulevard does not currently connect Rowland Boulevard with South Novato Boulevard to the south. As part of a residential development, plans have been proposed to extend Redwood Boulevard and make it a continuous route between these two roads.

2.118 Rowland Boulevard functions as an east-west collector route between South Novato and Redwood Boulevards, and U.S. 101. Between South Novato and Redwood Boulevards, Rowland Boulevard has two traffic lanes in each direction plus left-turn pockets in a median. This basic land configuration extends across the freeway. Rowland Boulevard does not currently extend east beyond the northbound freeway ramps. Traffic volumes along Rowland Boulevard are moderate.

2.119 The following table indicates the present level of service at the principal intersection along these local streets for peak hour traffic on a Friday afternoon.

TABLE 2

FRIDAY PM PEAK HOUR LEVEL OF SERVICE FOR LOCAL STREETS, 1977

<u>Intersection</u>	<u>Type of Control</u>	<u>Level of Service 1/</u>
South Novato Blvd. & Diablo Ave.	Signal	B
South Novato Blvd. & Rowland Blvd.	Signal	A-B
South Novato Blvd. & Sunset Pkwy.	4-way stop	B
South Novato Blvd. & Redwood	1-way stop	A
Redwood Blvd. & Diablo/DeLong Ave.	Signal	A-B
Redwood Blvd. & Rowland Blvd.	Signal	A
On & Off-Ramps at Rowland	Northbound on-ramp has a stop, otherwise no controls present	A

1/ Level of service interpretation (based on the National Academy of Sciences, Highway Capacity Manual):

- A: Excellent operations; no vehicle waits longer than one red indication.
- B: Very good operation; an occasional queue on an intersection approach may develop.
- C: Good operation; occasionally, vehicles may have to wait through more than a red signal indication.
- D: Fair operation; vehicles may be required to wait through more than one red signal indication during peak periods.
- E: Poor operation; long queues at controlled intersections, may be delayed for several signal cycles.

Source: EIP, 1979.

2.120 Transit. The Golden Gate Bridge Highway and Transportation District and the Marin County Transit District have the responsibility for the provision of public transit along South Novato Boulevard and U.S. 101, however, none of the existing bus routes provides direct service to the project site. Route 1 is the only designated "local" bus route operating within Novato. Route 1 operates on a 30 minute headway throughout most of the day on weekdays, and 60 minute headways on Saturdays. In general, there is limited transit service within the City of Novato, and no local service is in the immediate vicinity of the study areas.

2.121 Bicycle and Pedestrian Movement. Existing pedestrian movements in the general area of Rowland, Redwood, and South Novato Boulevards are limited. The only pedestrian route to the Hanna Ranch site would require walking across the overpass, which involves crossing the freeway on and off-ramps at several points.

2.122 Redwood Boulevard between Diablo and Rowland Boulevards, Rowland Boulevard between Redwood Boulevard and Cambridge Street, and South Novato Boulevard between center Road and Rowland Boulevard are designated as bicycle routes. Limited data is available on bicycle movements along the streets in the vicinity of Hanna Ranch, however, this information indicates only limited use of the bike routes during the weekday evening peak period. Bicycle travel, however, is more prevalent during the morning and mid-afternoon periods, and during the spring and summer months.

2.123 Alternative #5. Access to the HAFB surplus properties is provided by a network of highways and local streets. Highway 101, which is adjacent to the western boundary of the site, is the major route connecting HAFB with the principal populated areas of Marin County and San Francisco to the south, and Novato and Sonoma Counties to the north. In the vicinity of Hamilton, traffic volumes on Highway 101 are congested southbound in the morning but typically have no significant traffic congestion during the evening peak period.

2.124 Access from the regional highway network to Hamilton is provided by either the Pacheco (Nave Drive) interchange to the south or the Ignacio interchange at the north end of HAFB. The Pacheco interchange is currently constructed in a modified "cloverleaf" configuration, designed to favor traffic exiting the freeway from the south. This configuration operates well under existing traffic conditions, with a strong traffic bias to and from the south. The Ignacio interchange is currently being upgraded to improve traffic movements and capacity. This interchange is constructed in a modified "diamond" configuration, with a single cloverleaf in the southwest sector favoring movements exiting from the north and headed toward HAFB.

2.125 The principal streets providing access to HAFB are two frontage roads paralleling Highway 101. Nave Drive, a two-lane arterial on the east side of the freeway, runs from the Pacheco interchange at the south to the Ignacio interchange on the north. Nave Drive is the only direct access road to HAFB with two entrances to the base and one leading to the residential area south of the base.

2.126 Alameda del Prado is a two-lane frontage road along the west side of Highway 101, running from just south of the Pacheco interchange at the south to Ignacio Boulevard at the north. The only current connections from Alameda del Prado to the surplus base property are overcrossings at the two interchanges.

2.127 The following table shows the existing (1978) service levels at key intersections/highway segments for afternoon peak hours in the vicinity of Study Area 5.

TABLE 3
SERVICE LEVELS

<u>Intersection/Segment</u>	<u>1978</u>
Ignacio Blvd & Enfrente Road	A
Bel Marin Keys & Nave Drive (existing)	A
Alameda Del Prado & U.S. 101 SB-on/off ramps	A
Nave Drive & North Entrance to HAFB	A
U.S. 101 SB south of Nave Drive	B
U.S. 101 NB south of Nave Drive	D
U.S. 101 SB north of Ignacio Blvd.	B
U.S. 101 NB north of Ignacio Blvd.	D

Source: A.D. Little, 1979.

2.128 Transit. The Golden Gate Bridge, Highway and Transportation District and the Marin County Transit District have the responsibility for the provision of public transit service in Marin County. Several bus lines pass by or near the Hamilton site. Bus route 50 makes local stops between Ignacio Boulevard and Bolling Road on Nave Drive. Bus route 70 and commuter bus routes 52, 54, 74, 76, and 78 stop at the Ignacio and Alameda del Prado bus pads on Highway 101. Bus route 1 makes local stops on Ignacio Boulevard and Alameda del Prado.

2.129 Bicycle and Pedestrian Movement. Ignacio Boulevard, from Sunset Parkway to Alameda del Prado and Alameda del Prado are designated as recreational bicycle routes. A regional bike path parallel to Highway 101 connects Novato to San Rafael, starting at the Pacheco interchange and extending southward to Marinwood. Designated bicycle lanes exist on Ignacio Boulevard, but not on Alameda del Prado.

2.130 Existing pedestrian movements in the general area of Nave Drive are limited. Sidewalks are provided on one side of Nave Drive. Pedestrians must use unpaved shoulders in much of the area.

2.131 Impacts.

2.132 Alternative #1. Traffic on both local city streets and on Highways will increase in the future even without the addition of a shopping center. The change in service levels caused by this increase is indicated by Table 5, (page 35).

2.133 Alternative #2. Automobile traffic impacts were identified by analyzing both the quality of traffic flow and how it changes as a result of developing the proposed shopping center, and by evaluating the general operational characteristics of the proposed center's site access and circulation plan.

2.134 The analysis of the quality of traffic flow was conducted for the year 1982. Table 4 summarizes the traffic generation estimates used in analyzing the shopping center traffic impacts.

TABLE 4
SHOPPING CENTER TRAFFIC GENERATION 1/

<u>Traffic Situation</u>	<u>Evening Peak Hour</u>		<u>24 Hour Total</u>	
	<u>Trip Rate 2/</u>	<u>Total 3/</u>	<u>Trip Rate 2/</u>	<u>Total 3/</u>
Typical Friday: In	1.52	1,498	17.5	17,260
Out	1.58	1,559	17.5	17,260
Total	3.1	3,057	35	34,520

1/ Corresponds to fully operational and matured shopping center. This maximum level of trip generation was used for the impact analysis.

2/ Trip Rate is expressed as the number of trips per 1000 square feet of gross leasable floor area.

3/ Total trips are based on 986,300 square feet of gross leasable floor area.

2.135 The directional distribution of shopping center trips is as follows:

60%	South of Rowland Blvd.
21%	North of Rowland Blvd.
13%	West of U.S. 101
6%	East of U.S. 101 on S.R. 37
100%	Total

2.136 The projected traffic volumes (1982) for the typical Friday situation in the vicinity of the proposed shopping center are indicated on Plate 13. These traffic volumes are used to project the "Level of Service" for local intersections. The six levels of service (National Academy of Sciences, 1965) used in characterizing how well, or how poorly, a highway segment or local street intersection is functioning are described as follows:

- Level of Service A - excellent operating conditions: no delays experienced at signalized intersections; free flow on highways

- Level of Service B - very good operation: generally no delays at signalized intersections; stable flow on highways

- Level of Service C - good operation: occasional short delays at signalized intersections; stable flow on highways

- Level of Service D - fair operation: short delays at signalized intersections more common; approaching unstable flow, but still maintaining tolerable speeds on highways

- Level of Service E - poor operation: some longstanding queues at signalized intersections; unstable flow on highways - low speeds and momentary stoppages

- Level of Service F - forced flow: jammed conditions with long standing queues at signalized intersections; reduced speed and long stoppages occur on highways

2.137 For planning purposes, Level of Service "D" is generally considered to be the upper level of congestion which is tolerable in an urban area, and is used as a design standard and basis for developing roadway improvements by the Marin County Department of Public Works. Level of Service D will subsequently be used as a transportation service standard in evaluating the traffic impacts of the proposed shopping center.

2.138 The following table summarizes the results of the shopping center impact analysis for the major local city street intersections in the study area for a Friday afternoon.

TABLE 5

SHOPPING CENTER TRAFFIC IMPACT ON LOCAL CITY STREET INTERSECTIONS

<u>Intersection</u>	<u>1978</u>	<u>Level of Service</u>	
		<u>1982 Traffic Situation</u>	
		<u>Alternative #1</u> <u>1/</u>	<u>Alternative #2</u> <u>2/</u>
South Novato Blvd. & Diablo Ave.	B	B	B
South Novato Blvd. & Rowland Blvd.	A-B	B	B
South Novato Blvd. & Sunset Pkwy.	B	B	B
South Novato Blvd. & Redwood Blvd.	A	A	A
Redwood Blvd. & Diablo/DeLong Ave.	A-B	B	B
Redwood Blvd. & Rowland Blvd.	A	A-B	B

1/ Base = 1978 traffic projected to 1982.

2/ Typical Friday = 1982 base traffic plus a typical Friday evening peak shopping center traffic

Source: EIP, 1979.

2.139 In general, the shopping center should not have a significant impact on the quality of traffic flow at the major local street intersections in the study area. Further, in no case does the level of service exceed level "C" (good operation), therefore indicating that the existing street system can adequately accommodate the increased traffic generated by the shopping center.

2.140 The following table summarizes the results of the impact analysis for the signalized freeway ramp/street junctions and street intersections adjacent to the proposed shopping center site. (Refer to Plate 9 for intersection locations.)

TABLE 6
SHOPPING CENTER TRAFFIC ON ADJACENT INTERSECTIONS

Signalized Location	1978	Level of Service	
		1982	
		Alternative #1 <u>1/</u>	Alternative #2 <u>2/</u>
I Freeway Ramp Junctions			
N/B 101 Off-Ramp and New City St. <u>1/</u>	-	-	A
N/B 101 On-Ramp & Rowland Blvd.	A	B	B
S/B 101 Off-Ramp & Rowland Blvd.	A	A	B
II Street Intersections <u>2/</u>			
Rowland Blvd. & New City St.	-	-	A
First Entrance to Center <u>3/</u>	-	-	A
Second Entrance to Center <u>3/</u>	-	-	A

1/ As per site plan; to be constructed as part of shopping center development.

2/ To be built as part of shopping center development.

3/ Entrances off of Rowland Blvd.

Source: EIP, 1979.

2.141 These results indicate that Level of Service "B" (very good operation) or better can be maintained at each of the signalized locations.

2.142 Table 7 summarizes the results of the proposed shopping centers impact on the operation of the freeways serving the development.

TABLE 7

SHOPPING CENTER TRAFFIC IMPACT ON FREEWAY SEGMENTS

Road Segment	Direction	1978	Level of Service 1982	
			Alternative 1	Alternative 2
<u>U.S. 101</u>				
South of SR 37	N/B	D	E	F
	S/B	B	B	C
Betw. SR 37 & Rowland Blvd.	N/B	C-D	D	D
	S/B	A-B	A-B	B
Betw. Rowland Blvd & DeLong Ave.	N/B	C	C-D	D
	S/B	A	A	A
<u>State Route 37</u>				
East of U.S. 101	W/B	A	A	A
	E/B	A	A	A
<u>Freeway/Ramp Junctions: Rowland Blvd. Interchange</u>				
Northbound on		C	C	C
Northbound off (Loop)		-	-	C
Northbound off (Direct)		C	C	C
Southbound on (Direct)		C	C	C
Southbound on (Loop)		-	-	C
Southbound off		C	C	C

N/B = Northbound

S/B = Southbound

W/B = Westbound

E/B = Eastbound

Source: EIP, 1979.

2.143 For the case where no development occurs in the Study Area (Alternative #1), traffic volumes are expected to increase to the point where the freeway will be operating at Level of Service E over that portion of U.S. 101 which is south of the State Route 37 junction. Developing the shopping center will have the effect of exacerbating this congested condition. The level of service will reach level "F" for the

typical Friday traffic conditions. This freeway congestion is not expected to have any direct effect on local street traffic because of the lack of suitable alternative traffic routes which could be used as a diversion, and the trip characteristics of the travelers on U.S. 101.

2.144 Between State Route 37 and the Rowland Boulevard interchange, the level of service for northbound traffic is not degraded further as a result of the provision of an auxiliary lane for the Rowland Boulevard off-ramp. The shopping center is expected to have only a small but not unacceptable impact on northbound traffic for the segment of U.S. 101 north of the Rowland Boulevard interchange, and no unacceptable impacts on the level of service for southbound travel along each of the U.S. 101 freeway segments.

2.145 State Route 37 is expected to operate at Level of Service "A" for all traffic conditions. Also shown in Table 7 are the results of an analysis of the freeway/ramp junctions. This analysis of ramp capacities indicates that all ramps will be operating at Level of Service "C" or better.

2.146 Site Access and Circulation. The costs of the proposed new road and freeway on and off-ramp construction will be borne by the developer (Deitrich, 1979). The design of the proposed northbound J.S. 101 off-ramp loop serving traffic heading westbound on Rowland Boulevard is such that it increases the accident potential for vehicles using this ramp as compared with the existing direct off-ramp. Two principal factors give rise to this situation: (1) with a variable curve radius, as is used for the proposed loop ramp, it is more difficult for drivers to maintain control of their vehicles while decelerating from freeway speeds; and (2) because of the need for a signal at the junction of the loop off-ramp with Rowland Boulevard, queuing will occur on the curve. During periods of peak travel demand, existing vehicles may have difficulty perceiving the queued vehicles in time to stop safely.

2.147 The "triangular" roadway configuration around the parcel of land containing the financial institutions is unduly complicated and may be confusing to drivers. It will be difficult to synchronize the operation of the three traffic signals in this triangular roadway configuration to operate efficiently.

2.148 Table 6 indicates that the level of service estimated for the intersections of Rowland Boulevard and the new city street and shopping center entrances are well above the design standard (i.e., Level of Service A vs. D). This indicates that the segment of Rowland Boulevard west and south of the northbound freeway on-ramp is over-designed. A through lane in each direction could be dropped without significantly affecting traffic operations.

2.149 The shopping center site plan indicates that sufficient parking will be provided to satisfy the needs of the center. The site plan provides for five parking spaces per 1,000 square feet of gross leasable area (GLA). This exceeds the City of Novato Development Standard of four spaces per 1,000 square feet GLA, but is consistent with the findings of a recent study (EIP, 1977) of parking requirements for regional shopping centers.

2.150 Transit Travel Impacts. There are currently no existing bus routes which serve the shopping center site. Provisions are made on the shopping center site plan for a bus pull-out to serve passengers boarding and alighting. However, because of the street configuration in the vicinity of the shopping center and the location of the bus pull-out at the rear side of the center, routing of buses into and out of the center will be awkward and inefficient. A relocation of the transit stop to a more prominent location could enhance transit service to the center.

2.151 It is not expected however, that even with the inauguration of either a new transit route, or the diversion of an existing route, that a significant number of trips to the shopping center will be made by transit to affect the automobile travel impacts. 1/

2.152 Pedestrian and Bicycle Impacts. Pedestrian and bicycle movements along Kowland, Redwood, and South Novato Boulevards are not expected to be significantly affected by the additional traffic generated by the shopping center. First, there are only limited pedestrian and bicycle movements along these routes. Second, adequate pedestrian and bicycle facilities are in-place to minimize conflicts with automobiles. Third, while traffic along these roads will increase (and therefore the number of potential conflicts will increase), the magnitude of the increase, on the order of 10 to 15%, is not excessive and does not pose a major concern.

2.153 Because of the physical separation between the shopping center and the residential areas in the City of Novato, it is not expected that a large number of walking trips will be made into the shopping center. However, walkways should be provided along the Rowland Boulevard overpass and into the shopping center. Bicycle travel into the center may be significant due to the recreational facilities being planned. To accommodate this potential demand and to maintain continuity with the existing system of bicycle paths in the City, separate bicycle lanes across the

1/ Assuming that bus service to the center would operate at an equivalent 15-30 minute headway during the peak period, using typical load factors, this service would likely divert only 2-4% of the total trips into and out of the center.

Rowland Boulevard overpass and into the center should be provided. If desired, however, the curb lane in one direction across the overpass could be widened to facilitate bicycle movements. Potential conflicts between bicycles, pedestrians and automobiles at the junction of the freeway ramps and Rowland Boulevard will create a potentially hazardous condition that will be difficult to control, and will further discourage access to the center by those modes.

2.154 Cumulative Impacts. In analyzing and reporting the traffic impacts of the proposed regional shopping center, it was assumed that there would be no further development of the adjacent lands which comprise the Hanna Ranch property. However in total there remains approximately 50 acres (20 acres north of the center and 30 acres south of the center) which could be developed for commercial and industrial uses. Development of the proposed regional shopping center will induce development of these remaining sites. The purpose of this section is to provide an indication of the incremental traffic impact of this subsequent development of the adjacent sites.

2.155 Table 8 illustrates the trip generation characteristics for alternative uses which could be developed on the adjacent sites.

TABLE 8

COMPARATIVE TRIP GENERATION RATES FOR A TYPICAL
FRIDAY TRAFFIC SITUATION

	TRIP GENERATION RATES (Trips Per 1,000 Square Feet Gross Leasable Area)		
	24 HOUR	PM PEAK	PM PEAK AS % OF THE PM PEAK FOR THE PROPOSED RSC 1/
I. Proposed RSC	35.	3.1	-
II. Alternative Uses for Adjacent Sites			
- Community Shopping Center	57.	4.5	145%
- Neighborhood Shopping Center	90.	7.2	232%
- Discount Store	73.	3.7	119%
- Sit-down Restaurant	63.	3.9	126%
- Fast-food Restaurant	185.	12.0	387%
- Supermarket	141.	12.7	410%
- Industrial	6.	1.8	58%

1/ Assumes that the relationship between the gross leasable floor area and the gross project site area is the same for the alternative development uses as is planned for the proposed regional shopping center (i.e. approximately 13,000 sq. ft. gross leasable floor area per acre).

Source: EIP, 1979.

2.156 Projecting the cumulative impact of developing the adjacent sites in addition to the proposed project is extremely difficult. However, it can be stated that further retail or industrial development will likely have the effect of increasing the congestion on U.S. 101. The local street impacts are less evident and will depend on the specific use developed.

2.157 Mitigation.

2.158 Automobile Travel Mitigation Measures. There is no apparent need to make major physical or operational improvements to the local street system beyond those being proposed by the developer. Minor operational improvements will be necessary to insure the efficient movement of traffic. In addition to revising the timing of existing traffic signals, one specific improvement involves striping the westbound approach on Rowland Boulevard at Redwood Boulevard to establish an exclusive right-turn lane.

2.159 The section of U.S. 101 South of State Route 37 serving the northbound travel movements is projected to be operating at level of service "E" for the 1982 base case. Inclusion of the shopping center's traffic will have the impact of further degrading the level of service in this freeway segment to level "F". Short of adding another lane to U.S. 101, this problem cannot be resolved. ^{1/} It should be pointed out that in the event that no further improvements are made and the freeway becomes jammed on a routine basis, drivers will modify their travel behavior. This will be particularly true for persons traveling during the evening, shoppers coming to the center will likely choose to change the time they travel to the shopping center to a time period when the congestion is less critical (i.e., before 4:00 p.m. or after 6:30 p.m.) or take local routes which parallel the freeway. This shift in the time of travel will have a mitigating effect on the congestion which is projected along the U.S. 101 and its northbound off-ramp at the Rowland Boulevard interchange.

2.160 For traffic accessing the shopping center from Route 37, adequate signing (i.e., having the new road to symbolize the center) should be provided to encourage those persons to access the site from the south along Hanna Ranch Road and similarly to return to Route 37 from Hanna Ranch Road, therefore bypassing U.S. 101 and the congestion expected along that road.

2.161 Should the proposed access and circulation layout indicated on the current shopping center site plan be adopted, it is recommended that the lane configuration for that segment of Rowland Boulevard which is east and south of the northbound U.S. 101 on-ramp be modified to two lanes in each direction plus exclusive turning pockets. However, to mitigate the potential accident and driver orientation problems associated with the recommended access and circulation layout, it is recommended that the existing northbound direct off-ramp be modified and a new northbound loop

^{1/} The draft EIS for Hamilton Air Force Base recommends that a northbound auxiliary lane be added to U.S. 101 between the Ignacio Boulevard interchange and State Route 37. This improvement will be effective in reducing traffic congestion over this freeway segment.

on-ramp be constructed. The modified northbound direct off-ramp would have two lanes along the ramp, and three lanes at its intersection with Rowland Boulevard - two lanes for left turn movements, and one lane for free right-turns into an additional lane on Rowland Boulevard which will extend to the first shopping center entrance.

2.162 This access modification will eliminate the need for redirecting the existing northbound direct off-ramp and constructing the two short city street roadway segments. Access to the shopping center site itself can be achieved using the two entrances shown on the existing site plan which connect with Rowland Boulevard. These intersections will need to be signalized.

2.163 Table 9 shows the results of an analysis of the traffic impacts associated with this alternative access design.

TABLE 9

ALTERNATIVE SHOPPING CENTER ACCESS DESIGN
TRAFFIC IMPACTS ON ADJACENT INTERSECTIONS

<u>Signalized Intersections</u>	<u>Level of Service</u>			
	<u>1978</u>	<u>Base</u>	<u>Typical Friday</u>	<u>Holiday Friday</u>
I. Ramp Junctions				
N/B 101 Off-Ramp & Rowland Blvd.	A	B	B	D
S/B 101 Off-Ramp & Rowland Blvd.	A	A	B	B
II. Street/Entrance Intersections				
First Entrance to Center	--	-	A	C <u>1/</u>
Second Entrance to Center	-	-	A	A

1/ Right turn lane into center will operate at LOS "D".

Source: EIP, 1979.

2.164 None of the intersection would be operating at less than a "C" level of service. In effecting this alternative access design, it will most likely be necessary to relocate the siting of the financial institutions to a more accessible location.

2.165 Transit Mitigation. To serve the transportation needs of the young, elderly, and other transit dependent segments of the population, transit service should be established. The opportunity exists for providing both local and intra-regional transit service to the shopping

center without making extensive capital investments. Local transit service can initially be provided by rerouting Route No. 1 along Rowland Boulevard and into the center. Intra-regional bus service could be provided by establishing covered bus pads at the Rowland Boulevard interchange where Route 70 could make a new stop.

2.166 Alternative #3. This alternative will generate the same volume of traffic as the shopping center proposed by Alternative #2 and a similar distribution of that traffic over local streets. Traffic distribution and level of service for Highway 101 and 37 may vary slightly from that projected for Alternative #2 depending upon on and off-ramp configurations.

2.167 Alternative #4. This alternative would generate the same volume and distribution of traffic as Alternative #2 for the retail section of the site. Additional automobile trips would be generated by the industrial portion of the development. If one assumes that the gross leasable area of the proposed industrial development is one million square feet and industrial uses generate 6 trips per 1,000 square feet gross leasable area, then an additional 6,000 vehicle trips per day would be generated by the industrial area. The peak hour traffic generation will depend upon the type of industrial development. This peak hour traffic will contribute to the morning traffic congestion along U.S. 101.

2.168 Alternative #5. This alternative is expected to generate a similar volume of daily trips (34,500) as the center proposed in Alternative #2 because they are of equivalent size. The trip distribution is expected to be as follows:

Trip Direction

North on Highway 101	39.0%
South on Highway 101	57.0
Bel Marin Keys Boulevard	0.6
Ignacio Boulevard	2.6
HAFB (Existing)	0.8
	<u>100.0%</u>

2.169 Exit into the property from U.S. 101, either in a northbound or southbound direction, is not now satisfactory for the anticipated vehicular traffic to be generated by the proposed project. Road improvements would be necessary for any large scale development of HAFB. In Marin County's application to GSA for acquisition and development of the base improvements were proposed including the construction of two new access roads. The first would cross Nave Drive and Highway 101, connecting with the Alameda del Prado just north of the HAFB North Gate. The second new access road would connect north from HAFB to Bel Marin Keys Boulevard. Both entrances to HAFB would be widened to four lanes and some improvements would be implemented on surrounding streets. An extra lane would be added to the northbound lanes of U.S. 101 to the

Rowland Avenue interchange, and an auxiliary lane between the Ignacio interchange and Highway 37 would be added. Although Marin County's application has been withdrawn, it is assumed that any plan for intensive development of the base would also include these measures. The cost for the improvements (estimated at \$3,600,000 by Urban Projects Inc.) would probably be assumed by the developer(s).

2.170 The following table shows the 1978 level of service for key intersections in the project area for 1978 and for 1985 without the HAFB development (without proposed improvements).

TABLE 10
LEVEL OF SERVICE, STUDY AREA 5

<u>Intersect'ion/Segmen'</u>	<u>1978</u>	<u>1985 Without HAFB Development</u>
Ignacio Blvd. & Enfrente Road	A	D
Bel Marin Keys & Nave Drive (Existing)	A	D
Alameda Del Prado & U.S. 101 SB On/Off Ramp	A	A
Nave Drive & North Entrance to HAFB	A	A
U.S. 101 SB South of Nave Drive	B	B
U.S. 101 NB South of Nave Drive	D	F
U.S. 101 SB North of Ignacio Blvd.	B	C
U.S. 101 NB North of Ignacio Blvd.	D	F

Source: A. D. Little, 1979.

2.171 Levels of Service for development of a regional shopping center have not been prepared. It is assumed that if the proposed road improvements are implemented, vehicular movement on Highway 101 will be improved over the 1985 without development levels.

2.172 Public Transportation. Additional bus transit service would likely be provided to serve the commercial and industrial activity. Since the primary development area is well removed from the freeway, either substantial rerouting or supplemental shuttle buses would be required. Possibly both of these approaches would be used.

2.173 Bicycle and Pedestrian Movement. Traffic will increase significantly on Nave Drive and Alameda del Prado. This will result in increased conflicts between pedestrians/bicycles and automobiles. However, because of the distance from the freeway, it is not expected that a large number of non-auto trips will be made.

2.174 CLIMATE/AIR QUALITY

2.175 Present Conditions.

2.176 Alternatives #1-5. Located near the west shore of San Pablo Bay, Novato's climate can be characterized as Mediterranean since nearly all the rainfall occurs during the winter months. The relatively high terrain surrounding Novato affords some protection from the strong marine influence of San Pablo Bay. This results in a slightly greater temperature range for Novato as compared to the rest of Marin County. Temperatures in Novato range from a mean daily maximum of 82° F in July to a mean daily minimum of 38° F in December. Although there are frequent wide fluctuations, the average annual precipitation is 26 to 30 inches. While ocean fog is generally excluded due to the surrounding hills, dense ground fog does occur frequently in the flat areas of Novato.

2.177 The prevailing wind is generally northwesterly with variation depending on the season. Low wind speed occurs frequently as measurements of wind speed taken at nearby Hamilton Air Force Base indicated that 45% of the observations were under 5 mph. Novato's sheltered location together with frequent low wind speeds produces a potential for significant air pollution.

2.178 To realize significant, long-term controls over air problems it is necessary to evaluate a proposed project's impact on a local, sub-regional, and regional scale. The California State Air Resources Board recommended to EPA that the San Francisco Bay Area be designated as an Air Quality Maintenance Area (AQMA) for carbon monoxide, total suspended particulates, and oxidants since the Ambient Air Quality Standards are not expected to be met by the target year of 1982. To realize significant long-term controls over areas with air pollution problems, a detailed air quality analysis is required for all developments proposed within an AQMA to evaluate the project's impact on the air quality in the region. The air quality analysis conducted to identify impacts on the proposed project alternatives are detailed in Appendix A.

2.179 The nearest air quality monitoring site to Novato is located several miles to the south in San Rafael. Since both Novato and San Rafael are influenced generally by the same climatic factors, air quality data for San Rafael may be considered representative of Novato. Table 11 shows that oxidant and carbon monoxide are air quality concerns near Novato. The precursors of oxidants are hydrocarbons and nitrogen dioxide. Carbon monoxide (CO), hydrocarbon (HC), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and total suspended particulates (TSP) concentrations at the project site have been estimated independently and are discussed in the impact section.

TABLE 11

NUMBER OF DAYS EXCEEDING STATE OR FEDERAL AIR
QUALITY STANDARDS IN SAN RAFAEL, 1977 AND 1978 ^{1/}

<u>Pollutant</u>	<u>Days Exceeding Standard</u>	
	<u>1977</u>	<u>1978</u>
Oxidant	2	2
Carbon Monoxide	0	1
Nitrogen Dioxide	0	0
Sulfur Dioxide	0 ^{2/}	0 ^{2/}
Total Suspended Particulate	0	1.6 ^{2/}

^{1/} Bay Area Air Quality Maintenance District.

^{2/} Percent of observed days when State air quality standard was exceeded.

2.180 Impacts.

2.181 Alternative #1. The "Without Project" conditions shown in Tables A-5 thru A-8 of Appendix A are representative of the no project alternative. Carbon monoxide is the most important pollutant considered for the local analysis. The projected "Without Project" CO concentrations on hypothetical sensitive receptors for both the 1-hour and 8-hour averaging times are less than the concentration levels under existing conditions and no CO concentrations exceed their respective standards. This improvement in CO concentration levels despite the growth in traffic would be primarily due to further development and refinement of vehicular emission control systems. Concerning the subregional scale analysis, Table A-8 indicates that the HC background concentrations are expected to exceed the standards for the 3-hour averaging time. Also, the NO₂ background concentrations are expected to exceed the 1-hour and 1-year standards for all gridsquares except one. All other background pollutant concentrations are well within the limits specified by the Ambient Air Quality Standards. There would be no regional impact.

2.182 Alternative #2. The local scale analysis reveals that CO concentrations at hypothetical sensitive receptors located 5 meters in distance from the U.S. 101 road links exceed standards for the 1-hour averaging time due to the proposed project. While this may be considered significant, in actuality there are currently no (and it is reasonable to

assume none in the future) residences or other sensitive receptors within 5 meters of U.S. 101. Concentrations of CO at other hypothetical sensitive receptors located 5, 20, and 100 meters from the other links do not exceed the standards. The subregional analysis indicates the HC concentrations for the proposed project, with one exception, exceed the standards and the proposed project's impact on total concentrations may be considered significant ranging from 17% to 54%. Background concentrations of NO₂ for both the 1-hour and 1-year averaging time, except for one gridsquare, greatly exceed the Ambient Air Quality Standards. The proposed project NO₂ concentrations never exceed 42% of the standards. However, the proposed project's impact on the total concentrations ranges from 14% to 50% and may be considered significant for all gridsquares except one, for the 1-hour averaging time. The regional analysis indicates the project-related emission's impact on the region would be minimal.

2.183 Alternative #3. Same as Alternative #2.

2.184 Alternative #4. This alternative includes developing all of the 127 acre project site plus 20 acres adjacent to and north of the Rowland Boulevard interchange in accordance with the existing city plans.

2.185 The site would be utilized by developing retail uses on the northern 53 acres and industrial land uses on the remaining 92 acres. It is estimated that the total number of vehicle trips generated during an average day will be greater than the number projected for Alternative #2. The air quality impacts would be greater than that of Alternative #2.

2.186 Alternative #5. The local scale analysis reveals that CO concentrations at hypothetical sensitive receptors located 5 meters in distance from U.S. 101 road links for the "With Project" condition exceed the standard for the 1-hour averaging time. However, the "Project Only" concentrations do not impact on the U.S. 101 road links and no other road links exceed the standards for the 1-hour and 8-hour averaging times. The subregional analysis indicates that HC concentrations for both the background and project conditions, with one exception, exceed the standard and the proposed project's impact may be considered significant ranging from 39% to 94%. Background concentrations of NO₂ for one gridsquare exceed the 1-hour averaging time standard. While the proposed project's NO₂ concentrations never exceed 35% of the standards, the proposed project's impact on the total NO₂ concentrations range from 16% to 86% and may be considered significant. The regional analysis indicates the project-related emission's impact on the region would be minimal.

2.187 Mitigation.

2.188 Alternatives #2-5.

2.189 Mitigation of Construction Impacts. An effective water program (complete coverage twice daily) can reduce dust emissions by about 50 percent; reclaimed water should be used when available. Other control measures include scheduling of major dust-generating activities in the early morning hours or at times when the winds are low, and construction phasing such that major earth-moving and demolition activities occur during late fall, and early spring months, when soil has maximum moisture content.

2.190 Mitigation of Traffic-Related Impacts. The mitigation of increased carbon monoxide, hydrocarbon, nitrogen dioxide and other transportation-related pollutants is directly related to traffic mitigation measures. Any measure that would reduce traffic volumes, such as encouraging transit use, would reduce air emissions. As discussed in the traffic section, however, transit use historically has not had a major impact on shopping center traffic. Employees at the center would be most likely to use transit. A van pooling or car pooling program by the management of the center is one possible alternative to reduce employee auto use.

2.191 Measures that would encourage bicycle use at the center would include secure bicycle parking areas, lockers and showers for employees, and bicycle lanes along project roads.

2.192 Improving traffic flow would also relieve air quality impacts as pollutant emission rates increase rapidly as vehicle speed decreases. Any factor that reduces vehicle speed and increases idling time, such as congestion, will increase pollutant rates.

2.193 NOISE

2.194 Present Conditions.

2.195 Alternatives #1-4. The study area is currently open space with no significant noise source. The dominant noise sources affecting the site are: (a) vehicular traffic on U.S. 101, (b) Northwestern Pacific Railroad trains (1 or 2 times a day), and (c) aircraft flights using Hamilton Air Force Base. Presently, few aircraft use the Hamilton air field. Final disposition of the base has not yet been determined, so future flight activity is not known.

2.196 Noise monitoring was performed at the study area in 1973. The monitoring found that average noise levels on the site ranged from below 50 dBA on the east side of the site, to 72 dBA near Highway 101. (A dBA (a-weighted decibel) is a unit of loudness corrected for a variation in response of the typical human ear at common environmental noise levels.) These measurements included a passing train and a number of aircraft passing overhead from Hamilton Field. Except for the area next to Highway 101, the noise levels presently experienced on the site are expected to be lower than in 1973 due to the reduction in air traffic.

2.197 The City of Novato has adopted the League of California Cities "Neighborhood ambient sound level" goals which indicate that ambient sound levels should not exceed 65 dBA for commercial use and 60 dBA for light industrial use. The western edge of the study site presently exceeds these goals due to traffic noise from Highway 101.

2.198 The 1978 Novato General Plan states that land use decisions around airports shall be based on the Noise Exposure Forecast (NEF) contours derived from the maximum probable level of activity. NEF contours for the "maximum possible" level of activity at Hamilton Air Force Base are based upon the number of flights at the base in 1972. The study area is situated on the border between the 30 and 35 NEF zones (Plate 11).

2.199 According to the General Plan, commercial land uses in areas with less than a 35 NEF, and industrial uses in areas with less than 40 NEF are considered "satisfactory." New construction requires no special insulation. Commercial use of the area from 35 to 45 NEF requires that "Construction should be undertaken only after an analysis of noise is made and noise insulation features included.

2.200 The Federal Highway Administration (FHWA) has also established minimum noise compatibility standards for determining impacts of highway projects. The FHWA criteria for commercial land uses call for L_{10} levels of 75 dBA or below. The L_{10} is the dBA level exceeded 10 percent of the time. The L_{10} for the study area ranged from a high of 77 dBA adjacent to U.S. 101 to 54 dBA near the Northwestern Pacific Railroad tracks according to the monitoring survey undertaken in 1973.

2.201 Alternative #5. Based upon the Noise Exposure Forecast Map (NEF) in the 1978 Novato General Plan, Study Area 5 is within the 40 NEF contour. Commercial activity in this area "should be undertaken only after an analysis of noise is made and noise insulation features included. This analysis is based upon the 1972 air craft activity level at Hamilton. Noise generated on site is not significant.

2.202 Impacts.

2.203 Alternative #1. Ambient noise in most of the study area may decrease from the 1973 levels if air traffic at Hamilton Air Force Base is discontinued or if the air field is used by commercial aircraft since commercial jets and general aviation aircraft are quieter than military jets. The portions of the study area closest to Highways 101 and 37 may experience increased noise in the future due to increased vehicular traffic on those routes. There would be no change in noise generated in the study area under this alternative.

2.204 Alternative #2. The proposed project would be an acceptable land use under the NEF criteria set forth in the Novato General Plan, assuming air traffic levels are not allowed to exceed the 1972 levels of activity. It should be noted that at that time Hamilton had almost 40 flights per day of noisy military jets (F106s, F4s, T38s and T33s). Since the base has been closed and declared surplus property, military usage is not likely to be resumed. Commercial jets and general aviation aircraft are quieter than military jets, hence the NEF criteria are judged to be "worst case" projections.

2.205 The principal source of on-site generated noise would be from auto and truck noise. This impact would be minor in comparison with the noise generated from traffic on Highway 101. Noise impacts upon the regularly used public spaces would be reduced by the insulating properties of the proposed windowless masonry wall design of the enclosed shopping mall.

2.206 Under the FHWA criteria, the proposed shopping center would be a compatible land use, although its western side, being located about 125 feet from the edge of the freeway would be on, or possibly over, the L₁₀₇₅ borderline.

2.207 During the construction phase of the project, most equipment to be used would generate noise levels ranging from 75 dBA to 82 dBA at 100 feet. Pile drivers, however, would generate up to 92 dBA at 100 feet. The nearest sensitive noise receptor is the residential area across the freeway. Because of the distance between the homes and the site (over 800 feet) the construction noise would not exceed the ambient levels experienced today at those homes. The pile drivers, however, may be noticeable because of the sharp staccato character of their sounds.

2.208 Alternative #3. Same as Alternative #2 above.

2.209 Alternative #4. Same as Alternative #2 above, except that industrial activity may increase the noise generated on site. Since no plans have been proposed for this alternative, the magnitude of on-site noise is not known.

2.210 Alternative #5. The noise effects of automobile and truck traffic generated by the proposed project are not expected to be significant.

2.211 Mitigation.

2.212 Alternatives #2-5. The final design of the project should be reviewed by a qualified acoustical engineer to insure that the high exterior noise levels are adequately buffered.

2.213 During construction the pile drivers should be shielded so as to reduce the noise transmitted by their operation to the residential neighborhood west of the project site. Construction activity, and particularly pile driving, should not be allowed before 8 a.m. or after 5 p.m. or on weekends/holidays.

2.214 POPULATION, EMPLOYMENT AND HOUSING

2.215 Present Conditions.

2.216 Alternatives #1-5. The population in Marin and southern Sonoma County (generally Petaluma and the Sonoma Valley) serve as the trade area under consideration in this environmental statement. Historical population for major geographic areas are shown in Table 12. Between 1960 and 1970 the population of the trade area increased by 84,000. This rate of increase was significantly greater than the rates for both the State and the San Francisco-Oakland SMSA (Standard Metropolitan Statistical Area), which is composed of the counties of San Francisco, Alameda, Contra Costa, San Mateo and Marin. Since 1970 the growth in population for the trade area has slowed to an annual growth of 1.1%. This growth rate is greater than that for the San Francisco SMSA but less than the growth rate for the State.

2.217 Table 13 presents the trade area population projections prepared by several agencies and a projection of population recommended by Keyser Marston Associates, Inc. The latter projection, which indicates a trade area population of 310,000 in 1980, 325,000 in 1985 and 355,000 in 1990, falls towards the low end of the population projections which have been prepared by the sources indicated in the table. (The upper end of the range incorporates projections in the Marin Countywide Plan which are considerably higher than indicated by recent trends and are considered unrealistic by the Marin County Planning Department in oral communication with Keyser Marston Associates, Inc.) (EIP, 1979.)

TABLE 12
POPULATION TRENDS
(000's)

	<u>1960</u>	<u>1970</u>	<u>1978</u>	<u>Change 1960-1970</u>		<u>Change 1970-1978</u>	
				<u>#</u>	<u>Annual %</u>	<u>#</u>	<u>Annual %</u>
State of California	15,717	19,953	22,075	4,236	2.4	2,122	1.3
San Francisco SMSA <u>1/</u>	2,649	3,113	3,197	464	1.6	84	0.3
Marin County	147	207	227	60	3.5	20	1.2
Central Marin	83	116	120	33	3.4	4	0.4
Northern Marin	22	39	47	17	5.9	8	2.4
City of Novato	(18)	(31)	(40)	(13)	(5.6)	(9)	(3.2)
Southern Marin	36	45	48	9	2.3	3	0.8
Rural Marin	6	9	12	3	4.1	3	3.7
Sonoma County	147	205	268	58	3.4	63	3.4
Southern Sonoma	34	58	63	24	5.5	5	1.0

Trade Area <u>2/</u>	181	265	290	84	3.9	25	1.1

Note: Figures may not add due to rounding.

1/ San Francisco-Oakland Standard Metropolitan Statistical Area, consisting of the counties of San Francisco, Alameda, Contra Costa, San Mateo and Marin.

2/ Marin and Southern Sonoma Counties.

Source: U.S. Bureau of Census
Urban Decision Systems, Inc.
California Department of Finance
Marin County Planning Department (Verbal Communications)
Sonoma County Planning Department
City of Novato Department of Planning

TABLE 13
MARIN AND SOUTHERN SONOMA COUNTIES
POPULATION PROJECTIONS
(000's)

	<u>1978</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
Marin County				
General Plan				
County Wide Plan	227 <u>1/</u>	260	280	306
Growth Oriented	227 <u>1/</u>	296	330	365
ABAG Series 3	227 <u>1/</u>	225	234	277
State Dept. of Finance	227 <u>1/</u>	228	242	259
Trend, 1970-1978	227 <u>1/</u>	232	247	262
Southern Sonoma County				
ABAG Series 3	63 <u>2/</u>	92 <u>3/</u>	108 <u>3/</u>	128 <u>3/</u>
County of Sonoma	63 <u>2/</u>	75	84 <u>4/</u>	95
Trend, 1970-1978	63 <u>2/</u>	69	73	77

Total Trade Area				
High Range	290	388	438	493
Low Range	290	294	307	336
Selected for Projection Purposes	290	310	325	355

1/ State Department of Finance.

2/ Sonoma County Planning Department (1978 estimate by Keyser Marston Associates, Inc., based on interpolation of 1975-1980 data).

3/ ABAG figures adjusted to conform to census tracts in trade area.

4/ Interpolation of 1980 and 1990 data.

Source: Association of Bay Area Governments, 1975 Data Base,
Revised Projections, March 15, 1978.

2.21^a Key demographics for the Trade Area, City of Novato, and the San Francisco-Oakland SMSA are presented in Table 14. As shown, the Trade Area and the City of Novato are more affluent, have attained higher educational levels, and account for a higher proportion of professional and managerial personnel than the San Francisco-Oakland SMSA. Professional, managerial, and clerical workers represented almost 60% of the total employed work force for the trade area in 1970.

TABLE 14
DEMOGRAPHIC CHARACTERISTICS

	Trade Area	City of Novato	San Francisco- Oakland SMSA ^{1/}
<u>Income - 1978</u>			
<u>Family Income</u>			
Under - \$10,000	13.8%	9.4%	16.5%
\$10,000 - \$14,999	12.3%	13.6%	14.5%
\$15,000 - \$24,999	34.3%	35.8%	37.5%
\$25,000 - \$49,999	32.2%	37.2%	26.6%
\$50,000 plus	7.5%	4.1%	5.0%
Average Household Income	\$22,400	\$22,800	\$18,800
Per Capita Income	\$ 8,200	\$ 7,000	\$ 7,500
<u>Education/Population Age 25+ - 1970</u>			
Any College	43.9%	36.0%	33.4%
Median School Years	12.8%	12.7%	12.5%
<u>Occupation - 1970</u>			
Professional/Technical	27.7%	17.9%	18.4%
Manager/Proprietor	14.8%	11.8%	9.8%
Clerical	18.7%	21.2%	23.2%
Sales	10.8%	10.3%	8.4%
Crafts	9.9%	12.0%	12.2%
Operators	6.5%	7.7%	11.3%
Service	12.3%	15.8%	12.6%
Laborer	3.4%	3.1%	3.9%
Farm Worker	0.9%	0.3%	0.3%
<u>Race</u>			
Black	2.1%	3.3%	10.6%
Mexican-American	5.8%	5.9%	11.7%
Other Minority	1.7%	1.8%	6.6%
Caucasian	90.4%	89.0%	71.1%

^{1/} Standard Metropolitan Statistical Area, consisting of the counties of San Francisco, Alameda, Contra Costa, San Mateo, and Marin.

Source: Urban Decision Systems, Inc.
Keyser Marston Associates, Inc.

2.219 The current condition of housing and housing availability in Novato may be generally classified as expensive and limited. As of October 1978 the average single family house price was \$100,600 in Novato (EIP, 1979). The Novato Sanitary District's treatment plant only has the capacity for 500 additional single-family dwelling unit equivalent connections per year until 1981.

2.220 Impacts.

2.221 Alternative #1. No change.

2.222 Alternative #2. The impact on population is expected to be slight for this alternative. The types of jobs provided by a regional shopping center are related to population impacts. Historically about 75 percent of shopping center employees are unskilled or semi-skilled with spouses of working residents supplementing family income, and youths, of both high school and college age, accounting for the majority of this employment category. A limited number of professional and managerial employment would result from the shopping center. Since few of the shopping center employees would be career sales people who are the primary source of family income and since housing costs would be prohibitively expensive for this category of employees, the relocation of shopping center employees to Novato would be minimal. As an example, major retailers at Northgate Shopping Center and at the Hilltop Center in Richmond have not experienced an influx of their out-of-area employees into the vicinity of the centers (EIP, 1979).

2.223 The proposed shopping center would provide for about 2,000 permanent jobs based on one employee per 500 square feet of building area. Most of the jobs would be for retail personnel, with jobs also available for cooks, clerks, janitors, security guards and others. Since youths and spouses comprise the largest share of the county's unemployed and underemployed population the shopping center would provide job opportunities for the unskilled and semi-skilled members of the unemployed work force as well as "clear" part-time positions. Development of the project would generate 550-600 person years of employment in the construction trades.

2.224 The proposed project does not include any housing and no displacement of residents from the site would occur when development is fully realized. Since most of the nearly 2,000 jobs created by the proposed project would be filled by youths and spouses supplementing the family income, few prospective employees are expected to relocate to Novato. Managerial and professional employees would probably relocate to the immediate area.

2.225 Alternative #3. Same as Alternative #2.

2.226 Alternative #4. Population and housing impacts would generally be similar to Alternative #2 given the cost of housing and the management policies that regulate and limit growth. In addition to the approximately 2,000 jobs created by the shopping center, jobs would be created in response to the industrial development of the southerly 92 acres. The number of jobs associated with the 92 acres would depend on the type of industrial development, e.g., manufacturing, warehousing, professional and administrative offices, laboratories.

2.227 Alternative #5. Same as Alternative #2.

2.228 LAND USE PLANS/POLICIES

2.229 Present Conditions.

2.230 Alternatives #1-4. The site is presently vacant but has been used for many years for grazing and fodder production. Some flood control construction in the form of the Lynwood Slough, weirs and a flood gate is evident.

2.231 Immediately adjacent to the eastern boundary of the proposed shopping center development is the Northwestern Pacific Railroad, beyond which is reclaimed marsh and agricultural land. To the north of the site, on Redwood Boulevard, is an area of mixed commercial/residential development including car sales, boat sales, a hardwood store, a K-Mart, restaurants, a trailer park and apartments. To the west of the site, beyond Highway 101 is a residential area of both single family homes and condominium development. To the south, beyond Highway 37, is an area used for dry grazing.

2.232 Federal Wetland and Flood Plain Policies. As described in paragraph 1.26ff Federal policy discourages destruction of wetlands and modification of flood plains for Federal projects and federally permitted projects. Alternatives #1-4 are all located within the 100-year flood plain (Plate 4) and Alternatives #2 and #4 are located in a wetland area.

2.233 State Wetland Policy. As stated in paragraph 1.30, the State Resources Agency has determined that the State Wetlands Policy does not apply to the project area.

2.234 City of Novato. The Novato General Plan (amended December 1978) states the following land use goals:

"The City shall put the land to its best use for the long-term benefit of the existing and future residents, including better economic balance by creating a greater number of jobs in the community."

"In making land use decisions, including location, timing, density, intensity, and design, the City shall be guided by the following considerations:

- a. Efficient utilization of existing public facilities (roads, transit, schools, utilities, etc.).
- b. Efficient utilization of existing private facilities (shopping centers, medical facilities, employment locations, etc.).
- c. Adopted programs or expansion plans of utilities and other service agencies.

d. Minimizing auto traffic and availability of public transportation.

e. The level of available or budgeted fire protection service.

f. Natural hazards, including geologic, seismic, fire and flood.

g. Financial impacts on the tax base and service responsibilities of the City and other public agencies.

h. Other considerations not listed above which may be pertinent for any particular case.

i. Maintaining and improving the social and economic stability of existing neighborhoods.

2.235 Additional land use policies of relevance to the development are:

a. Commercial and industrial uses shall be located to minimize truck traffic on City streets.

b. Convenience shopping should be located in neighborhoods; other stores and services should be encouraged to be located downtown, or where demonstrable need can be proven.

c. Highway (freeway) oriented commercial facilities should be encouraged in existing commercial areas in accordance with the Land Use Element Map.

d. Appropriate buffers shall be provided between residential neighborhoods and commercial or industrial development.

2.236 The Conservation and Open Space Element of the General Plan provides that:

a. The City shall not permit excessive grading, particularly canyon fills, sidehill cuts, and "daylighting" (grading of the top) of ridges and knolls, for development purposes.

b. Open Space - The City shall assist neighborhood residents in creating "neighborhood identity buffers" and connecting greenways".

2.237 Land Use Designations. The project area north of Lynwood Slough is zoned for commercial uses (C-P). The area south of Lynwood Slough is zoned for industry (M-P). Uses permitted for these areas are described as follows:

C-P: "retail sales and personal service uses normal to the commercial core of the community which are conducted entirely within a closed structure and are compatible with surrounding traffic patterns, office and professional service uses, multiple-residential and transient residential uses.

M-P: "temporary" short-term, open land uses which do not involve permanent physical improvements to the property, industrial and manufacturing uses, laboratories, sale or repair of industrial or manufacturing equipment, warehousing, wholesale distribution or storage uses, small retail and/or service commercial uses.

2.238 The site is also situated within the F-3 (Flood Plain) district and is subject to the requirements of the Marin County and City of Novato Flood Control District Regulations. The minimum finished floor elevation of structures shall be 8.0 feet msl after ultimate settlement, and the minimum elevation for streets, building pads, driveways, parking areas and other specified areas shall be 7.0 feet msl after ultimate settlement. The minimum elevations shall be increased to accommodate storm water runoff, and reasonable freeboard.

2.239 County of Marin. The Marin Countywide Plan (1973) designates most of the study area as urban open space and the remainder as developable. The plan provides a general guide for the preparation of more detailed local plans. It does not replace or substitute for local plans.

2.240 In the plan, downtown Novato is defined as a county-wide activity center which includes a future regional-level shopping center. The plan suggests strengthening the downtown center by prohibiting anything except local retail facilities in other parts of Novato.

2.241 Association of Bay Area Governments (ABAG). ABAG is a voluntary council of local governments formed to meet regional problems by cooperative action of cities and counties. ABAG's Regional Plan 1970-1990 designates Novato as a community center and as such should center around a core of intense activity where commercial, governmental, cultured, recreational, health and education services are provided. The plan also contains comments about subregional planning areas. The project site is designated for predominantly basic employment.

2.242 Alternative #5. The study area is mostly open space with some buildings on the southeast portions and ammunition storage facilities in the north. The surrounding land contains Army, Navy, and Coast Guard Facilities including an 8,000 foot long air strip. The property is wholly within the boundaries of the City of Novato. The Hamilton Base site represents one of the larger land holdings potentially on the market in the urban corridor of Marin County.

2.243 Federal Government. In March of 1976 the General Services Administration (GSA) declared certain portions of the base (approximately 1650 acres) to be excess government property. Both GSA and the County of Marin are currently examining the range of possible uses to determine what action would be in the best public interest. The County had submitted a formal application to GSA for acquisition of much of the property for use as a public airport with related land developed for commercial/industrial uses to generate revenue to support the airport. The application was withdrawn in May 1979.

2.244 GSA's legal responsibilities for the base as defined by Congress require that the greatest national benefit be achieved from disposition. This involves consideration of economic return to the federal government, local economic and social concerns and environmental considerations. The property is to first be made available for public aviation use. If this use is determined by GSA to be infeasible then other uses will be considered in the order listed below:

1. Specifically - authorized categories of public use, at reduced or no cost.
2. Public body acquisition at full market value, for public purposes.
3. Open market sale at fair market value for any use. Although any requests for public use in step 1 must be screened, GSA has the authority to deem them of insufficient public benefit in comparison with the value generated in public sale, and to proceed to steps 2 and 3.

2.245 Portions of the study area are within the flood plain of the 100-year flood. Federal policy discourages development in the flood plain (paragraph 1.27).

2.246 City of Novato. The General Plan indicates that the citizens and official agencies have expressed strong opposition to future aviation use, based on possible economic liabilities, uncertainty of local control, and potential environmental impact. In recognition of that opposition, the City's policy is to achieve nonaviation uses. The City will develop policies and programs to maximize the public benefit from this area.

2.247 San Francisco Bay Conservation and Development Commission (BCDC). BCDC's San Francisco Bay Plan states that when the Hamilton Air Force Base is not needed by the Air Force, the "site should be evaluated for commercial or industrial airport use as part of regional airport system study; keep runway approach and take off areas clear of tall structures and incompatible uses."

2.248 BCDC's jurisdiction extends 100 feet inland from the mean high water (MHW) line, therefore the regional shopping center site is outside BCDC jurisdiction.

2.249 Association of Bay Area Governments (ABAG). Hamilton Air Force Base is one of four possible sites proposed by ABAG and the Metropolitan Transportation Commission as a potential regional airport for the north bay. Regional commercial use is opposed by Marin County. The County has proposed that the site be used for a general aviation airport and intends to prohibit air carrier service by aircraft exceeding twenty passenger capacity.

2.250 Impacts.

2.251 Alternative #1. This alternative would not change current land use on the site. It would remain as open space, in conflict with city land use plans.

2.252 Alternative #2. This alternative would convert the project site from open space to commercial use.

2.253 Federal Policies. This alternative is in conflict with Federal policies discouraging destruction of wetlands and modification of the flood plain.

2.254 Zoning. This alternative would require an amendment to the Novato General Plan to change the zoning of the southern 92 acres of the project site from industrial use (M-P) to commercial use (C-P). The City of Novato is currently considering this change. Amending the General Plan requires submission to the City of an Environmental Impact Report (EIR) on the proposed project. Approval of the project EIR requires a public hearing before the Planning Commission and the City Council. The proposed use is compatible with the current zoning (C-P) for the area north of Lynwood Slough.

2.255 City. This alternative would provide additional employment in the Novato area, so it is consistent with the general plan in this respect. The project would utilize existing highways so truck traffic on city streets would be minimized, however, the project as designed would not minimize auto traffic, nor encourage use of public transportation.

2.256 The project would increase the City's tax base as described on page 78. Comparison shopping would be provided, however, it would not be consistent with the stated city goal to locate commercial facilities in downtown Novato. In conversations with the Novato Planning Department it has been determined that there is a lack of developable land sites large enough to accommodate a regional shopping center downtown. The Hanna Road site is the closest available site to the City for a shopping center.

2.257 The project design calls for grading of the southernmost hill on the site. This would not be in accord with city policy.

2.258 County. Most of the proposed project would be built in an area which has been recommended by the county to remain as open space. The proposed shopping center will also compete with shops in the downtown area in conflict with the recommendation of the county plan.

2.259 ABAG. This alternative would be consistent with the concept of a city-centered region and would provide additional commercial facilities, and employment opportunities in Novato.

2.260 Alternative #3. Same as Alternative #2 except that a zoning change would not be required and the existing wetland would be preserved. The southern half of site would remain open space and the southernmost hill would not be graded.

2.261 Alternative #4. Same as Alternative #2 above, except that a zoning change would not be required.

2.262 Alternative #5. This alternative would involve construction of a 77-acre regional shopping center in what is now primarily open space. The Corps is considering this alternative as it was presented in Marin County's application to GSA. Although Marin County's application has been withdrawn a regional shopping center is still a possibility under an alternate disposal plan as outlined in step 3, paragraph 2.240.

2.263 Federal Policy. This alternative conflicts with the Federal Policy discouraging development in flood plains.

2.264 City of Novato. A regional shopping center on this site would conflict with the city's goal to consolidate commercial activity downtown. This alternative would create competition to the shops in the downtown area. Surface street traffic through Novato would not be increased by this alternative. Extensive grading would not be required.

2.265 BCDC and ABAG. This alternative would not affect the potential for a regional airport on the HAFB site.

2.266 ECONOMICS

2.267 Present Conditions.

2.268 Alternatives #1-5. There are basically two types of retailing: convenience and comparison shopping. Convenience shopping occurs within close proximity to one's residence and consists of those items needed on a regular basis such as food and drug items. Comparison shopping involves the purchase of items from a selection of goods which are usually offered in several different stores. Comparison goods include general merchandise, apparel, furniture and miscellaneous speciality items. The market area for a comparison shopping retail center usually extends for a radius of 8 to 10 miles which is much larger than that for a convenience good retail center.

2.269 There are three basic types of retail concentrations: the neighborhood center, the community center, and the regional center. The characteristics of the various retail concentrations are shown in Table 15. An example of the neighborhood center is Pacheco Plaza in Novato, which retails primarily convenience goods, with comparison shopping occupying less than half of the retail area. The Nave Shopping Center in Novato is an example of the community center type of retail concentration. Up to two-thirds of the space in a community center can be used for comparison shopping and the major tenant is usually a variety, discount or junior department store or a major convenience store like a supermarket.

TABLE 15

TYPES OF RETAIL CONCENTRATIONS

	Neighborhood Center	Community Center	Regional Center
Major Tenants	Supermarket and/or drug.	Variety store, discount, or junior department store, supermarket.	Two or more full- line department stores of at least 100,000 sq. ft.
Typical Retail Area	30,000-100,000 Square Feet.	100,000-300,000 Square Feet.	300,000-1,000,000+ Square Feet.
Usual Minimum Site Area	3-5 Acres.	10+ Acres.	30-50+ Acres.
Support Required	5,000-25,000 People.	40,000-150,000 People.	150,000+ People.
Typical Draw	1-2 Miles.	3-5 Miles.	8-10 Miles.
Major Type of Goods Offered	Food, drugs, liquor and services such as dry cleaners etc.	General merchandise small appliances, food, drugs, apparel and services.	Department store type goods, i.e., apparel, furniture, large appliances, jewelery, sporting goods, etc.

Source: Urban Land Institute, Shopping Center Development Handbook, Keyser Marston Associates, Inc.

2.270 The bulk of comparison shopping is done at regional centers. These regional centers, such as Northgate Shopping Center in San Rafael, can vary in size from 300,000 to over 1,000,000 square feet of retail area. The strength of regional centers is dependent on the two to five department stores that serve as anchors to the shopping complex.

2.271 The larger retail complexes in Marin and southern Sonoma Counties are shown in Table 16 and Plate 12, along with proposed major projects. The major retail center nearest to the site is downtown Novato, which consists of a traditional downtown retail area on Grant Avenue and several community shopping centers anchored by supermarkets, super drug stores, and large women's apparel stores. The separate retail centers in the downtown do not function effectively as a single coherent commercial district (EIP, 1979).

2.272 Also, shown are major proposed retail projects in the trade area excluding the Novato Center project. Of the four proposed projects, two (Marin Mall and Larkspur Fashion Mall, were rejected by the City Councils of Corte Madera and Larkspur in January, 1979. The two remaining proposed projects have a combined retail area of 490,000 square feet of which approximately 380,000 square feet would be devoted to comparison goods space. Of the 380,000 square feet perhaps 200,000 square feet would be for department stores.

2.273 Sales trends for Marin and southern Sonoma County are shown in Tables 17 and 18. The general conclusion is that sales trends for the trade area compare favorably in the 1970-1977 period to sales trends in the SMSA. For the entire trade area and for all taxable retail goods, sales increased 38% from 1970 to 1977, compared to 19% for the SMSA, in constant 1976 dollars. Table 18 shows the 1970-1977 trend in taxable retail sales for comparison goods in the trade area. The table indicates a real (non-inflationary) growth of \$63.6 million in sales of these items in the trade area since 1970, a rate of increase of 4.7% annually. Based on first quarter 1978 results, 1978 sales are estimated at about \$245 million (Keyser Marston Associates, Inc., 1978).

2.274 Calculation of retail potential is based on the dollar expenditures for comparison type retail goods in the trade area. These expenditures were estimated by comparing per capita incomes in the trade area with incomes in the entire San Francisco - Oakland SMSA and adjusting per capita sales in the SMSA to reflect the incomes in the trade area. Per capita income in the SMSA is \$7,500 compared to \$8,200 in the trade area. Per capita comparison goods sales in 1978 for the SMSA were estimated at \$1,040. The 1978 per capita expenditure level in the trade area is estimated at \$1,200, based on a similar ratio of expenditures for these types of retail goods to per capita income.

TABLE 16

MARIN AND SOUTHERN SONOMA COUNTY
LARGER RETAIL COMPLEXES

Center	Location	Map Key	Retail Area (Sq. Ft.)	Timing	Major Tenants
<u>Present Larger Centers</u>					
Northgate Shopping Center	San Rafael	1	640,000	1965	Sears (200,000 sq. ft.) Emporium (270,000 sq. ft.) Macy's (75,000 sq. ft.) J.C. Penny (25,000 sq. ft.)
Downtown San Rafael	San Rafael	2	250,000	--	
Corte Madera Shopping Center	Corte Madera	3	240,000	1958	J.C. Penny (45,000 sq. ft.) Montgomery Ward (65,000 sq. ft.)
Downtown Mill Valley	Mill Valley	4	125,000	--	
Larkspur Landing	Larkspur	5	170,000	1978	Fry's Market (40,000 sq. ft.)
Central Sausalito	Sausalito	6	85,000	--	
San Anselmo	San Anselmo	7	185,000	--	
Town and Country Village	Mill Valley	8	95,000	1965	
Downtown Novato ^{1/}	Novato	9	400,000	--	
Major Petaluma Stores	Petaluma	10	<u>100,000</u>	1973-76	J.C. Penny (50,000 sq. ft.) Mervyn's (50,000 sq. ft.)
Total			2,290,000		

TABLE 16
(Cont'd)

MARIN AND SOUTHERN SONOMA COUNTY
LARGER RETAIL COMPLEXES

Center	Location	Map Key	Retail Area (Sq. Ft.)	Timing	Major Tenants
<u>Proposed Major Projects Other Than Novato Regional Shopping Center</u>					
Marin Mall ^{1/}	Corte Madera	11	670,000	1980 or Later	Macy's (180,000 sq. ft.) Bullock's (145,000 sq. ft.)
Larkspur Fashion Mall ^{2/}	Larkspur	12	475,000	1980-81	Unannounced (260,000 sq. ft.)
Corte Madera Shopping Center Expansion	Corte Madera	3	+300,000	1980-81	Possible major department store and expansion of existing center.
K-Mart and Ancillary	Petaluma	13	<u>190,000</u>	1980-81	K-Mart (85,000 sq. ft.)
Total			1,635,000		

^{1/} Includes several shopping areas.

^{2/} Development plan turned down by City Council in January 1979. Corte Madera project (Marin Mall) may be redesigned at half the size; no action presently appears likely for the Larkspur Fashion Mall.

Source: Keyser Marston Associates, Inc.

TABLE 17
 NUMBER OF OUTLETS
 AND TAXABLE RETAIL SALES

	Outlets			Sales		
	1970	1977	%Change	1970	1977	%Change
					(\$000's 1976)	
Marin County	1,684	2,314	37.4	401,800	546,400	36.0
City of Novato	(171)	(242)	(41.5)	(44,200)	(69,000)	(56.1)
Southern Sonoma County	360	485	34.7	71,200	106,700	49.9
Petaluma	(262)	(343)	(30.9)	(57,400)	(84,000)	(46.3)
Sonoma	(98)	(142)	(44.9)	(13,800)	(22,700)	(64.5)
Trade Area Total	2,044	2,799	36.9	473,000	653,100	38.1
San Francisco SMSA	25,917	28,566	10.2	6,595,900	7,857,000	19.1

Note: For the purpose of comparability, sales totals exclude sales by service stations; the state gasoline sales tax became effective in 1972.

Source: California State Board of Equalization
 Keyser Marston Associates, Inc.

TABLE 18

MARIN AND SOUTHERN SONOMA COUNTIES
TAXABLE RETAIL SALES/COMPARISON GOODS
(\$000's 1976)

Store Type	1970	1977	Change, 1970-1977		
			(\$000's)	Annual%	1978 (Est.)
Apparel	\$31,500	\$42,200	\$10,700	4.3	\$45,000
General Merchandise	69,800	90,500	20,700	3.8	95,000
Furniture, Home Furn.	25,200	36,500	11,300	5.4	39,000
Specialty	<u>41,500</u>	<u>62,400</u>	<u>20,900</u>	<u>6.0</u>	<u>66,000</u>
TOTAL COMPARISON GOODS	\$168,000	\$231,600	\$63,600	4.7	\$245,000

Source: California State of Board of Equalization
Keyser Marston Associates, Inc.

2.275 Table 19 provides a residual analysis of comparison goods retail potential in the trade area from 1978 to 1990. In a residual analysis, present sales are deducted from the potential in the trade area to provide an estimate of the absorptive capacity of the market for new retail space. As noted in the table, present market demand warrants the addition of 700,000 sq. ft. of comparison goods retail space in the trade area, increasing to 1,100,000 sq. ft. in 1980, 1,600,000 sq. ft. in 1985 and 2,300,000 sq. ft. in 1990. In summary, the analysis indicates potential sufficient to support one major regional shopping center of approximately 1,000,000 sq. ft. by 1980 or two smaller centers (Keyser Marston Associates, Inc., 1978).

2.276 An important consideration is the availability of major department stores to anchor regional shopping center projects. Table 20 shows major tenant availability for regional shopping centers in the trade area. It is concluded that there are sufficient number of retailers under represented or unrepresented to anchor two major regional centers or a greater number of smaller centers to include expansions of existing centers (EIP, 1979).

2.277 Impacts.

2.278 Alternative #1. No impact.

2.279 Alternative #2. The establishment of a regional shopping center would affect the potential sales of existing commercial establishments in downtown Novato. The downtown retailing area of Novato is generally considered to be Grant Avenue, east and west of North Redwood which has a number of small comparison goods stores. Novato does not have any major department stores or a unified shopping district. The trade area of downtown Novato and the proposed regional shopping center would overlap with a more extensive array of goods offered at the proposed shopping center project. It is estimated that about 15 stores on Grand Avenue could be at a substantial competitive disadvantage with development of the proposed project. Impacts on the community shopping areas in downtown Novato would be slight owing to the absence in these areas of a significant amount of comparison goods retail space. Two large women's apparel stores which are major tenants at these centers would be adversely affected since the proposed project would provide a greater opportunity to comparison shop in these merchandise lines (Keyser Marston Associates, Inc., 1978). The adverse effect on the downtown stores would be the greatest during the first few years of the proposed project's existence. Following this, population and real income growth would serve to increase the sales of all existing establishments. It is not expected that the proposed project would cause existing establishments to be non-viable since there is an existing demand for a regional shopping center.

TABLE 19

MARIN AND SOUTHERN SONOMA COUNTY
COMPARISON GOODS POTENTIAL
OTHER STORES
(Sq. Ft.)

	1978	1980	1985	1990
Total Residual Potential for Comparison Goods	700,000	1,100,000	1,600,000	2,300,000
Department Store Residual Potential	400,000	600,000	700,000	1,000,000
Other Comparison Goods Stores Residual Potential	300,000	500,000	900,000	1,300,000

Source: Keyser Marston Associates, Inc.

TABLE 20

MAJOR DEPARTMENT STORE
REPRESENTATION IN TRADE AREA

	Fully Represented in Trade Area	Under- Represented in Trade Area	Unrepresented in Trade Area
Bullock's			X
The Emporium	X		
Liberty House			X
Macy's		X	
I. C. Penny		X	
Sears	X		
Montgomery Ward		X	
Mervyn's		X	

Fashion Specialty Stores

Saks			X
J. Magnin			X
T. Magnin			X
Nordstrom			X <u>1/</u>
Neiman Marcus			X <u>1/</u>

1/ Unrepresented in Northern California.

Source: Keyser Marston Associates, Inc.

2.280 The fiscal impact of the proposed project on the City of Novato is shown in Table 21. The annual revenues and costs shown in the table represent a shopping center that has opened and stabilized its sales volume three years after starting operation. Annual gross revenues in 1978 dollars are estimated at \$910,000 with estimated increased City costs of \$220,000. The City of Novato would realize a surplus of revenues over costs of about \$700,000. This table assumes that tax revenues will be distributed under the current formulas. It should be noted that redistribution of these revenues, due to revised formulas, would change the estimates.

2.281 In addition to the City of Novato, other County entities would receive property tax revenues from the proposed project. Total property tax revenues to all Marin County entities due to the proposed project at full development would be about \$700,000 annually with the County receiving about \$140,000 annually.

2.282 Alternative #3. Same as Alternative #2.

2.283 Alternative #4. The northern portion of the site, zoned C-P, has the potential for use as retail sales/personal services, office/professional service, and transient residential. Market support is rated highly favorable for the retail sales/personal services due to the shortage of retail space in the trade area. When considering a regional shopping center the impact would be the same as Alternative #2. Office/professional service use is rated as poor due to the following reasons: (1) Marin County has yet to establish itself as a major office center; (2) projects proposed or under construction elsewhere in the County will absorb most of the projected demand; (3) the site is not part of or adjacent to an established office center; and (4) the site does not enjoy unusual visual or other amenities in comparison to other available sites (EIP, 1979). The transient residential use also does not appear to be favorable due to the following: (1) business would be almost entirely dependent upon the transient business traveler since there is no major tourist attraction or convention facility near the site; (2) unusually favorable amenity factors are absent; and (3) present major facilities in Marin County are achieving unexceptional annual occupancy rates, with substantial vacancy in the winter months (EIP, 1979).

TABLE 21

CITY OF NOVATO
 ESTIMATED ANNUAL REVENUES AND COSTS
 NOVATO REGIONAL SHOPPING CENTER
 (1978 Dollars)

<u>Revenues</u>	
Property Tax <u>1/</u>	\$ 10,000
Business License Fees <u>2/</u>	10,000
Retail Sales Tax <u>3/</u>	850,000
Cigarette Tax <u>4/</u>	<u>40,000</u>
Total	\$910,000
<u>Costs</u>	
Public Works <u>5/</u>	\$ 40,000
Fire <u>6/</u>	Minimal
Police <u>7/</u>	<u>180,000</u>
Total	\$220,000
<u>Revenue Surplus</u>	about \$700,000

- 1/ Assumes market valuation of \$70/sq. ft., with City of Novato share of proceeds as per 8/13/78 memorandum from Marin County Auditor-Controller to all taxing entities in Marin County.
- 2/ As per fee schedule supplied by City of Novato.
- 3/ Assumes stabilized taxable sales volume of \$90 million x City share of sales tax receipts (or .95% of \$90M).
- 4/ Estimate, based on relation between cigarette and sales tax receipts, City of Novato, adjusted by Keyser Marston Associates, Inc.
- 5/ Based on cost estimates provided by City of Novato Department of Public Works (communication of 10/31/78).
- 6/ Based on written communication with Novato Fire Protection District (11/14/78).
- 7/ Based on discussion with Novato Crime Prevention Department (11/29/78); estimate assumes amortization of \$40,000 of one-time costs at annual constant of .10.

Source: Keyser Marston Associates, Inc.

2.284 The southern portion of the site, zoned M-P, permits a range of industrial/warehouse uses. These uses would be attractive for the following reasons: (1) the site has good exposure and access; (2) land costs are more favorable in northern Marin County compared to the major industrial concentration in the vicinity of the Highway 101-17 interchange; and (3) most of the space in existing industrial parks has been absorbed. Potential at the site may be viewed against the background of recent countywide absorption of 25 acres per year of industrial land in the major parks, and long term absorption trends of 10 acres per year. Most of the industries would be small space users, not transportation intensive, such as light manufacturing, research and development, local distribution and office related concerns.

2.285 Alternative #5. Similar to Alternative #2.

2.286 PUBLIC SERVICE/UTILITIES

2.287 Present Conditions/Impacts of Alternatives.

2.288 Police.

2.289 Alternative #1. Selection of Alternative #1 would result in no additional need for any public services and utilities. Present police, fire and emergency coverage and the existing storm drainage system are sufficient to serve the site in its present undeveloped state, without any additional public expense. No further discussion of this alternative will be made in the remainder of this section since no changes in this area of concern are anticipated.

2.290 Alternative #2. Selection of this alternative would require additional police services as estimated below:

<u>Personnel</u>		<u>Equipment</u>	
(Incl. Training & Equipment)			
2.7 Patrol Officers	@\$27,447 Per Person		
	(\$73,119)	1 Marked Patrol Unit	@\$20,589
1 Support Service Person	@\$12,248	1 Plain Patrol Unit	@\$11,723
1 Investigator	@\$22,447	1 Portable Radio	@\$ 2,014
	Total	Total	\$34,326
	\$107,814		

(EIP, 1979)

2.291 The above personnel and equipment (total cost - \$142,140) would be used to handle such activities as shoplifting, burglary, grand theft, and bad checks. The additional officers would also likely provide some traffic control during peak traffic periods or for accidents, and patrol the city streets around the project. Response to accidents and other emergency situations both on the project site and on city streets would also require the services of medical emergency personnel, usually the fire department.

2.292 Under Alternative #2 the shopping center itself would provide its own security personnel for internal traffic control and crime prevention. Since these persons would not be law enforcement officers, all security would have to be coordinated with the Novato Police Department. The applicant has proposed an off-premise control security alarm system, which would contact the Novato Police Department upon verification of unauthorized entry. This system should reduce public and private personnel needs and costs to protect property during non-business hours.

2.293 The California Highway Patrol would be responsible for normal patrol duties along U.S. 101 and Highway 37 and the on and off ramps to these routes.

2.294 Alternative #3. Selection of this alternative would create demand for additional police services similar to Alternative #2. Security measures similar to those of Alternative #2 would also likely be utilized in this development plan to reduce the need for police services.

2.295 Alternative #4. Selection of this alternative would create increased demand for additional police services. The retail portion of the development plan would likely require the equivalent amount of police services as Alternative #2. Demand for such services in the industrial southern portion of the development would require additional police services. The amount of the new services required would depend upon the type and number of business firms and the degree of private security provided by the firms.

2.296 Alternative #5. Additional police services for this alternative would be needed to perform the same function as described in Alternative #2. Estimated police manning requirements and costs are itemized below, given a development of about the same size and type (a 70+ acre regional shopping center):

	<u>Personnel</u> (Including Training & Equipment)		<u>Equipment</u> (Support)
3 Sworn Officers	@\$23,400 =	70,200	1 Patrol Unit @\$16,500 ea
1 Support Person	@\$12,000 =	12,000	
	<u>Total</u>	<u>\$82,200</u>	<u>Total</u> <u>\$16,500</u>

(Adapted from A.D. Little, 1979; unit costs differ from those shown in Alternative #2 as different sources were consulted.)

2.297 The annual total costs of these police services is estimated to be about \$98,700 (in 1978 dollars). Private security measures similar to those proposed in Alternative #2 would probably be used in this development plan, reducing the demand for increased police services.

2.298 Fire Protection.

2.299 Alternative #1. No change.

2.300 Alternative #2. The Novato Fire Protection District would be responsible for providing fire-fighting and rescue service for this development plan. The district has indicated that no expansion of service is expected for this development, due to budgetary restrictions

brought about by the 1978 passage of Proposition 13. To aid in improving fire-fighting ability and in fire prevention, an automatic sprinkler system with radio alarm boxes would be required by the district and to comply with fire insurance company requirements.

2.301 Alternative #3. The same requirements for fire-prevention and fire-fighting devices would apply for this alternative. Even though Alternative #3 is smaller in areal extent than Alternative #2, potential need for fire and rescue services would likely be the same since construction, design, function, and fire risk would be similar for both alternatives.

2.302 Alternative #4. Since this alternative involves both retail and industrial uses, demand for services would both increase and vary depending upon the type of business, products and potential hazards. Similar demands for fire district services can be expected in the northern commercial area as described for Alternative #3. The southern, industrial portion of this development plan may create additional fire hazards if firms located in the development used or possessed hazardous or flammable materials (light industrial zoning would likely preclude most firms using such risky substances).

2.303 Alternative #5. Since this development plan envisions a similar size and type of project to that of Alternative #3, the demand for fire district services is expected to be similar. Estimated additional service costs to the Novato Fire District, should it assume jurisdiction over the base, are \$200,000 to \$250,000 in annual operating costs and \$125,000 in initial capital costs (in 1978 dollars). Access and emergency response time may be greater than for Alternative #2, unless major access modifications are made or new fire district facilities are constructed. Since fire service is currently supplied by the U.S. Government, Hamilton Air Force Base fire protection responsibility would have to be assumed by either the County of Marin or the City of Novato. Full development of this alternative and other planned industrial uses on the base would require construction of a new fire station on the base. The foregoing cost figure does not include a new station.

2.304 Water Supply.

2.305 Alternative #1. No Change.

2.306 Alternative #2. This service would be provided by the North Marin County Water District. The districts water supply comes from the two sources: 20% from Stafford Lake and the remainder from the Russian River Aqueduct. Based upon data supplied by the proponent of this alternative, water consumption is expected to be as follows:

Irrigation	12.89 Acre Feet Per Year
Tenant Spaces	24.15 Acre Feet Per Year
Department Stores	14.32 Acre Feet Per Year

Total 51.36 Acre Feet Per Year (16,738,000 Gallons)

2.307 The above total is equivalent to the amount used by about 25 single family dwellings for one year. The district does not foresee any problems supplying this proposed project due to completion of the new Russian River Aqueduct, anticipated use of water from Warm Springs Dam beginning in 1983, and the current improved rainfall. In the event of failure to receive water from Warm Springs Dam and having to rely on current sources, the District has indicated that it would be difficult to supply the new development with sufficient water should drought conditions reoccur.

2.308 Alternative #3. Since this development plan would be smaller (53 acres vs. 77 acres for Alternative #2) but the same type of development as Alternative #2, it would consume less water (mainly due to reduced irrigation areas). Since this alternative would use less of the water district's resources and its capacity, more water would be available to future water consumers.

2.309 Alternative #4. The retail portion of this development plan would consume a similar amount of water as that of Alternative #3, given similar area and landscaping needs. The industrial portion of this plan would require similar amounts of water for landscaping, although less landscaping and pervious surface may result from this alternative. Human consumption of water may be greater in the industrial portion of this plan since people will be working at the site for longer periods than visiting shoppers. Little water consumption for industrial processing is expected due to the "clean" office/warehouse type uses allowed by the planned industrial zoning.

2.310 Alternative #5. Demand for water is expected to be about the same for this alternative as for Alternative #2, given the same landscaping requirements and commercial uses. Water for Hamilton Air Force Base currently is supplied by the Marin Municipal Water District (MMWD). Potential supply is available from the North Marin Water District via an existing pipeline cross-tie between the two systems. This is not currently being utilized. The MMWD may experience problems supplying a large commercial development at HAFB should drought conditions return. The current MMWD supply limit for the Hamilton Air Force Base area through the year 2000 is 2,500 acre-feet, so in normal rainfall years little impact on local water supply is expected.

2.311 Gas/Electricity.

2.312 Alternative #1. No change.

2.313 Alternative #2. The Pacific Gas and Electric Company would supply utility services to the project site. Annual consumption of gas and electricity for this alternative is estimated to be, respectively, 2.8×10^{11} BTU's and 2.1×10^7 Kwh. In comparison, an average Bay Area single family dwelling consumes about 9×10^7 BTU's of gas per year and about 6.5×10^3 Kwh of electricity per year (Pace, 1979). Estimated annual consumption by this development plan would be equal to that used by about 3,200 single family units. Peak demand for electricity would occur during summer, as with residential dwellings. Most of this demand would be for air conditioning. Greatest consumption of natural gas would occur during winter, since gas provides heating of most structures, including residential and commercial.

2.314 Alternative #3. Compared with Alternative #2, the same impacts are expected to be created by this development plan.

2.315 Alternative #4. The northern, retail portion of this development would consume similar amounts of energy as that of Alternative #3. The southern, industrial portion of this plan would possibly consume more energy depending upon the business firms which located on the site. Due to many separate structures versus one main clustered structure, heating and cooling losses would be greater resulting in greater energy consumption. Since all structures may not be for the same purpose or built at the same time to the same specifications, energy conservation measures cannot be as easily implemented or uniformly applied.

2.316 Alternative #5. Energy consumption by this development plan would be equivalent to that of Alternative #2, given the same energy-saving technology and requirements.

2.317 Liquid Wastes.

2.318 Alternative #1. No change.

2.319 Alternative #2. The Novato Sanitary District #6 would provide wastewater service for this development plan and for Alternatives #3, #4, and #5. The nearest treatment plant, which provides secondary treatment, is at the southeasternly end of Davidson Street in Novato, approximately 1/2 mile from the Hanna Ranch site. The nearest hookup point to the system is at Lamont Street and Franklin Avenue, approximately 2/3 mile from the project site. Current average dry-weather capacity for this facility is 2.5 mgd and average wet-weather flow is 18 mgd (mainly due to system infiltration). The Davidson Street facility is currently not meeting state and federal effluent discharge requirements and has been

given a compliance timetable by the Regional Water Quality Control Board. Until improvements in treatment level and capacity are completed (expected completion in 1981) Novato Sanitary District #6 has limited growth capacity of 500 new residential dwelling unit sewage connections per year. Alternative #2 is expected to generate about 12.7 MGY (0.034 MGD) of wastewater. This amount would be about 1.3% of the current dry-weather flow to the Davidson Street facility, and would consume about 22% of the current yearly available sewage reserve capacity. Therefore provided that treatment facility improvements are made on schedule and are certified by the RWQCB, development of this or the other alternatives would have a relatively minor impact of system reserve capacity and on the water quality of effluent receiving waters.

2.320 Alternative #3. Same as Alternative #2.

2.321 Alternative #4. Wastewater generated by the retail portion of this plan would be similar in content and volume to that of Alternative #3. Wastewater generated by the southern, industrial portion of this plan would be basically similar in content as the northern portion, although industrial wastes may also be present. The volume is unknown due to the lack of specific development plans.

2.322 Alternative #5. Wastewater generated by this plan would be equivalent in volume and content to that of Alternative #2. Sewage service is currently provided to the site by an on-site treatment plant and partially by connection to the Novato Sanitary District. Due to increased anticipated volume and the poor condition of existing treatment equipment, a new force main connecting the site with the Novato Sanitary District would be required. The same constraints on the Novato Sanitary District #6, as discussed under Alternative #2, would apply in this case as with the other development alternatives.

2.323 Solid Wastes.

2.324 Alternative #1. No change.

2.325 Alternative #2. This alternative is expected to generate about 5 tons per day of solid wastes, one-third of which is recyclable according to the proponent of this alternative. The nearest disposal site for these solid wastes is the Redwood Sanitary Landfill operation located on U.S. 101 north of Novato. The expected solid wastes generated by this plan would only be about 0.0036% of the current total annual wastes received by Redwood Sanitary Landfill. This alternative would not have a significant effect upon the area's landfill operation.

2.326 Alternative #3. The type and content of the generated solid wastes would be the same as that for Alternative #2, mainly plastic, wood, metal, and cardboard packaging materials, some possible food wastes and miscellaneous personal items (candy and sundry packaging, tobacco products and the like).

2.327 Alternative #4. The commercial portion of this plan would generate similar amounts and types of solid wastes as that of Alternative #3. The industrial portion would likely generate some of the same, plus discarded industrial supplies and packing materials. Toxic substances would have to be separated from the rest of the solid wastes and disposed of independently at authorized locations.

2.328 Alternative #5. Development of an equivalent (to Alternative #2) shopping center at Hamilton AFB would produce approximately the same amount and type of solid wastes as that of Alternative #2. Material recovery and recycling could reduce the volume of wastes requiring disposal and could also reduce energy usage and consumption of raw materials. For example, many retail and some industrial operations are now crushing and recycling cardboard packaging material, these materials likely being the major constituent of the solid wastes produced by both the retail and industrial portions of this alternative. Regardless of recycling efforts (which is ecologically and economically sound) relatively little impact would occur to local landfill operations, as the solid wastes generated would be volumetrically small and relatively non-toxic.

2.329 Public Works.

2.330 Alternative #1. No change.

2.331 Alternatives #2-5. Selection of Alternatives #2, #4, and #5 would require the greatest expenditure of public works maintenance funds to maintain city streets, utilities, and traffic control devices, since these three plans encompass the largest areas. Alternative #4, with its industrial portion, may contain a greater amount of interior surface streets to provide access to the different industrial tenants. This would increase relative public costs compared with Alternatives #2, #3 and #5. In the case of Alternatives #2, #3 and #5 much of the site would be privately owned with maintenance of parking lots and streets being the owner's responsibility. The result would be less area of responsibility for public entities. Any road network or parking area, as well as utility lines (above and underground) constructed on fill over Bay mud is likely to require additional unknown maintenance costs due to differential settlement. Examples of this situation are evident on many major roads around the Bay area, including the Bayshore Freeway (U.S. 101) and the eastern approach road to the Bay Bridge. Some consideration should be given to these anticipated additional maintenance costs in determining the economic effects of these proposed development plans upon the local government finance. Basic public works functions and costs are: street maintenance - \$1500/mile, street sweeping - \$240/mile, and street lighting - \$100/light/year. Based on preliminary engineering studies, development of Alternative #5 would require the greatest amount of road improvements in terms of the amount of construction and the dollar cost.

2.332 VISUAL QUALITY

2.333 Present Conditions.

2.334 Alternatives #1-4. The study area is located on the western edge of a broad grassy plain that was historically a tidal area of San Pablo Bay. To the north, west, and south are rolling hills covered with residences and some oak woodland. The area east of the project site is open space some of which is used for forage production. Downtown Novato is not visible from the study area due to the gently rolling terrain.

2.335 The major part of the study area is flat and has been used for hay production in the past. Two large hills covered by oak woodland are at the extreme southern end of the property. The project area is quite visible from the surrounding hills, from the major highways (U. S. 101 and State Route 37), and from the elevated Rowland Avenue interchange.

2.336 State Route 37 is included in the State Master plan for scenic highways, but it has not been officially designated as a scenic highway by the State Legislature. According to the General Plan for the City of Novato the City shall work out a planning program with the State to preserve the scenic resources viewed from the highway. Until the State's study is completed, the City shall refer any public or private development proposals which would be visible from Route 37 to the State Division of Highways for scenic review and recommendation.

2.337 Alternative #5. The area around Hamilton is primarily open space. The areas immediately north and south of the base have a bucolic aspect with grazing and limited cropland uses. Most of the upland areas of the base have been developed. The proposed shopping center site contains a few buildings and ammunition storage structures. The site is partially hidden from Highway 101 by a rock outcropping. To the north and east of the site are two large hills which have not been developed.

2.338 Impacts.

2.339 Alternative #1. No change.

2.340 Alternative #2. Because the project site is extremely open to view from the surrounding highways, the shopping center complex would be important in defining the visual character of the area. The proposed project would eliminate the open space and freshwater marsh east of Highway 101. Construction of the project would visually reinforce expanding strip commercial development prevalent along U.S. 101 in San Rafael and form an extension to the development pattern established by adjoining communities. Those familiar with the form and structure of Novato, and its residential and commercial areas, would sense a strong fracturing and decentralizing of the downtown area. The project would consist of a rectangular building cluster measuring about 2,100 feet by 550 feet.

Open air parking for 4,950 cars would surround the shopping center. The buildings would define a linear north - south axis. Ancillary buildings, the movie theater, restaurant and banks, would be at the northeastern end of the site and appear functionally isolated from the shopping center. The overall visual effect of the buildings and parking areas would not be unlike that of other suburban shopping centers throughout the Bay Area. The proposed project would not incorporate within its site either Novato Creek or the proposed lake. The inward orientation of the mall would preclude views of these features and the hillsides beyond.

2.341 Visual screening of the parking areas from U.S. 101 and Route 37 has not been provided. Reflections of the sun from automobile surfaces, and reflected area lighting from the pavement at night (especially when wet) would be an adverse visual impact to travelers on the highways and to nearby area residents. Unmitigated views of the large parking areas from the hill sides would create a negative impact.

2.342 Alternative #3. This alternative would commit less of the open space to development and the slough area would remain. The transition from the open space to development would be less abrupt than for Alternative #2.

2.343 Alternative #4. The impacts of this alternative are assumed to be similar to Alternative #2 although specific development plans for this alternative have not been made.

2.344 Alternative #5. This alternative would increase the urban aspect of the upland portion of the base. As the site is partially hidden from Highway 101 the visual impact from the roadway would be less than for Alternatives #1-4. Specific site plans for the shopping center have not been proposed.

2.345 Mitigation.

2.346 Alternatives #2-4. A transition between developed areas to the west and open lands to the east would be visually more effective if the development pattern were intensive and less rigid in its form. Open space within the project would relieve the expansive parking areas proposed and blend building structures to the landscape. The incorporation of a water feature into the plan would emphasize open space, add visual interest, relate the project to Scottsdale Pond on the west side of U.S. 101 and allow for passive recreation on the project site.

2.347 CULTURAL RESOURCES

2.348 Present Conditions.

2.349 Alternatives #1-4. In compliance with Section 106 of the National Historic Preservation Act of 1966 (16 U. S. C. 470(f)) the most recent listing of the National Register of Historic Places (Federal Register 6 February 1979 with monthly supplements through June 1979) has been consulted and determination has been made that no National Register property nor property eligible for inclusion therein is affected by the project. The State Office of Historic Preservation has been contacted, and the determination made that there are no recorded Points of Historic Interest or State Historic Landmarks on the project site.

2.350 The study area south of Lynwood Slough has been surveyed by Rick Hayes of the Anthropology Laboratory at Sonoma State University. The survey found no evidence of historic or archaeological resources on the site. One archaeological site (Mrn-319) had been recorded situated on a knoll within the project boundaries, however it was not rediscovered during the course of the survey. Apparently, it had been destroyed during construction of Highway 101 since no trace of it was found on either of the intact knolls.

2.351 Alternative #5. The latest listing of the National Register has also been consulted for this alternative and a determination has been made that no National Register property nor property eligible for inclusion will be affected by the project. The study area has been surveyed by Archeological Research and Consulting Services (ARCS) for cultural and historic resources. None were found in the project vicinity. A 1909 survey by N. C. Nelson reported site Mrn-160, a "shell mound" in the project vicinity. Major earth movement has occurred in this area, and the ARCS survey was unable to locate any evidence of the site, or of any others nearby.

2.352 Impacts.

2.353 Alternative #1. No change.

2.354 Alternatives #2-5. The alternatives would not impact any known cultural resources. Previously unknown historical or archaeological resources may be uncovered during construction.

2.355 Mitigation - Alternatives #2-5. If archaeological or historic resources are uncovered during construction, work should be stopped to permit professional evaluation of the find.

2.356 RECREATION

2.357 Present Conditions.

2.358 Alternatives #1-4. At present, there are no recreational facilities on the study site. The site is fenced, limiting public access. Novato Creek which forms the northern boundary of the site has been designated by the Novato General Plan as a part of a linear open space system. The Recreation Element of the plan indicates the possibility of creating horse trails and bike paths along Novato Creek and adjacent areas.

2.359 Alternative #5. The study area includes a large playing field which is not accessible to non-military personnel. The study area does not include any other recreational facilities.

2.360 Impacts.

2.361 Alternative #1. This alternative would leave the project site available for future recreation uses.

2.362 Alternative #2. The proposed site plan (Plate 3) indicates that a movie theater and ice rink would be provided as a part of the shopping complex. There is no provision for recreational facilities that are not directly associated with the project. Bicycle paths and pedestrian walkways have not been indicated.

2.363 As the proposed project is not expected to increase the population on or in the vicinity of the study site, it is not expected that the project will increase the need for recreational facilities in Novato.

2.364 Alternative #3. Same as Alternative #2 except that the area south of Lywood Slough would be available for future recreational use.

2.365 Alternative #4. Same as Alternative #2.

2.366 Alternative #5. The existing playing field would be destroyed. No recreational facilities would be provided by this alternative.

2.367 Mitigation - Alternatives #1-5. Provision of open space and areas for passive recreation within the shopping center, possibly incorporating and enhancing existing natural features such as the old Lynwood Slough and oak knoll on the Hanna Ranch site.

2.368 COMMUNITY COHESION

2.369 Present Conditions.

2.370 Alternatives #1-5. Novato residents have expressed a desire to have a regional shopping center in the city. For comparison shopping, residents currently must travel to either the Northgate Shopping Center 8 miles to the south, or to Santa Rosa 25 miles to the north. The Novato City Council has voted unanimously to recommend to the Corps that a permit be granted for the proposed Novato Center complex (Alternative #2).

2.371 The City of Novato has a semi-rural character with large expanses of open space within the city limits. The city has experienced rapid growth for the last 20 years. As a result, there is serious public concern over continued growth and preservation of the remaining open space. To reduce growth, the City Council has recently enacted a moratorium on construction of new multi-unit (over four units) dwellings and limited, to 500 per year, the number of new individual residential units. However, commercial growth is encouraged.

2.372 Impacts.

2.373 Alternative #1. This alternative would not involve development of the study area, however, the surrounding open areas to the south and west are likely to be developed in the future in accordance with the Novato general plan. Surrounding development may make the preservation of open space more important to area residents.

2.374 Alternative #2. This alternative would provide a regional shopping center in Novato. Community members would benefit from this alternative by the reduced traveling time on shopping trips and greater selection of goods and services.

2.375 Those familiar with Novato may sense a decentralization of the downtown area. Some concern has been expressed by downtown merchants that sales volume downtown will decrease.

2.376 This location would probably be preferred by Novato residents for a regional shopping center over the Hamilton site (Alternative #5) because: (1) it could be completed sooner, assuming no major objections and (2) it would probably involve less activity on city streets. However, community members may have negative feelings about the size, visibility and growth inducing potential of the proposed project.

2.377 The Corps has received comments from the Marin Audubon Society and the Save San Francisco Bay Association opposing filling of the old Lynwood Slough because of the loss of wildlife habitat involved. These comments represent the feelings of some of the local community.

2.378 Alternative #3. This alternative would provide a regional shopping center for area residents. This alternative would impact less on open space and the wildlife habitat along old Lynwood Slough would be preserved.

2.379 Alternative #4. This alternative would also provide a regional shopping center. The impact upon open space would be the same as Alternative #2.

2.380 Alternative #5. This alternative would also contribute to the decentralization of the commercial district. As this site is not as visible from Highway 101, and is somewhat removed from the center of Novato, the impact upon community atmosphere would be reduced.

3.00

UNAVOIDABLE ADVERSE IMPACTS

IMPACTS*	ALTERNATIVES				
	1	2	3	4	5
Potential damage to structures, utility lines and sewers from differential settlement and seismic hazards associated with construction on Bay Mud		X	X	X	X
Increased frequency and stage of flooding off-site		X		X	X
Increased quantity and decreased quality of storm runoff		X	X	X	X
Decrease in quantity and diversity of vegetation and wildlife		X	X	X	X
Increased air pollutant emissions from traffic generated by the project		X	X	X	X
Increased traffic congestion		X	X	X	X
Increased demands and costs for community services		X	X	X	X
Economic impact on downtown Novato commercial area		X	X	X	X
Increased consumption of water supplies, energy and demand for wastewater treatment		X	X	X	X
Alteration of views of the site from surrounding areas		X	X	X	X
Conflict with Corps of Engineers Policy on Wetlands		X		X	
Conflict with Federal Policy on Flood Plain Development		X	X	X	X

* "X" Denotes an impact for that alternative.

4.00 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE OF LONG-TERM PRODUCTIVITY

IMPACTS*	ALTERNATIVES				
	1	2	3	4	5
Loss of wetland habitat resulting in decreased biological productivity		X		X	
Elimination of potential for restoration of tidal action		X		X	
Loss of upland habitat decreasing biological productivity		X	X	X	X
Development in the flood plain decreasing ponding capacity and increasing the flood hazard off site		X	X	X	X

* "X" Denotes an impact for that alternative.

5.00 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION WOULD IT BE IMPLEMENTED*

COMMITMENT OF RESOURCES	ALTERNATIVES				
	1	2	3	4	5
Conversion of basically open space to urban use		X	X	X	X
Elimination of potential for restoration to tidal marsh		X		X	
Use of building materials and energy during project construction		X	X	X	X
Consumption of energy, water, and services during project operation		X	X	X	X
Destruction of eight acres of brackish marsh		X		X	
Permanent alteration in the appearance of the project site		X	X	X	X
Degradation of local air and water quality during project construction and operation		X	X	X	X

* "X" Denotes an impact for that alternative.

6.00 COORDINATION

6.01 Public Participation. The application for a Department of the Army permit by Richard Hanna (Alternative #2) was first announced by the Corps in a Public Notice No. 10138-33 on 27 January 1978. In accordance with Department of the Army regulations, comments were solicited in the Public Notice from the general public and specific Federal and State agencies. A Notice of Intent to prepare a Draft EIS was published in the Federal Register 8 May 1979.

6.02 Government Agencies. Comments on the Public Notice were received from the U.S. Department of the Interior, U.S. Department of Commerce, the U.S. Environmental Protection Agency and the Resources Agency of California. The comments are summarized here. The U.S. Department of Commerce and the Environmental Protection Agency will withhold comments pending the publication of this Draft Environmental Impact Statement. The Resources Agency of California has no objection to the issuance of the permit. The United States Department of the Interior will object to the issuance of the permit because the proposed activity is not dependent upon a wetland location.

6.03 Comments were also received from the following agencies:

. The San Francisco Bay Conservation and Development Commission has determined that they have no jurisdiction over the proposed project.

. The State Department of Parks and Recreation commented that no properties currently included in the State and National Registers for Archeology and Historic Landmarks would be affected by the proposed project.

. The Marin/Sonoma Mosquito Abatement District offered recommendations for design of the proposed lake to prevent mosquito breeding.

. The Marin County Department of Public Works commented that all development should be elevated above the 100-year flood plain of Novato Creek.

. The City of Novato commented that the city has granted a use permit for the proposed fill within the Corps jurisdiction.

6.04 Citizen Groups and Individuals. Comments on Public Notice 10138-33 were received from the Marin Audubon Society and Save San Francisco Bay Association. Both of these organizations objected to destruction of the wetlands on the project site. The Northwestern Pacific Railroad company commented that the railroad ditch indicated on the applicants drawings is actually on railroad property.

6.05 Comments Requested. Copies of this Draft Environmental Impact Statement were furnished to the following:

- a. U.S. Senators
Alan Cranston
S. I. Hayakawa
- b. U.S. Representative
John Burton
- c. State Senator
Barry Keene
- d. State Assemblyman
William Filante
- e. Federal Agencies
Advisory Council on Historic Preservation
Department of Agriculture
Western Technical Services Center
Soil Conservation Service
Forest Service
Department of Commerce
Secretary for Environmental Affairs
National Oceanic and Atmospheric Administration

Department of Energy
Department of Health, Education and Welfare
Department of Housing and Urban Development
Department of the Interior
Heritage Conservation and Recreation Service
Office of Environmental Project Review
Fish and Wildlife Service
Geological Survey
Department of Transportation
Coast Guard
Federal Highway Administration
Environmental Protection Agency
Government Services Administration
- f. State Agencies
Business and Transportation Agency of California
Division of Highways
CALTRANS
Health and Welfare Agency of California
Bureau of Sanitary Engineering
Vector and Waste Management Section
Environmental Health Services Section
Native American Heritage Commission
Office of Planning and Research

Resources Agency

Secretary for Resources
Air Resources Board
Department of Conservation
Department of Fish and Game
Department of Boating and Waterways Development
Department of Parks and Recreation
Department of Water Resources
State Reclamation Board
Regional Water Quality Control Board
San Francisco Bay Area Conservation and Development
Commission
Solid Waste Management Board
State Historical Preservation Officer
State Lands Commission
State Water Resources Control Board

g. Regional Agencies

Association of Bay Area Governments
Bay Area Air Quality Management District
Bay Area Sewage Services Agency
Metropolitan Transportation Commission

h. County Agencies

Marin-Sonoma Mosquito Abatement District
Marin County Planning Department
Marin County Public Works Department

i. City Agencies

Mayor of Novato
Novato Planning Department

j. Libraries

Marin County Library
Civic Center Branch
Novato Branch

k. Educational Institutions

Colorado State University
Environmental Design Librarian - University of California
Water Resources Center Archives - University of California
College of Marin

l. Chamber of Commerce

California Chamber of Commerce

m. Organization and Service Groups

League of California Cities

n. Conservation Groups

California Institute of Man in Nature
California Tomorrow
California Waterfowl Association
California Wildlife Federation
San Francisco Ecology Center
Environmental Defense Fund
ENVIRPYEST
Friends of the Earth
Institute for the Human Environment
Izaak Walton League of America, Inc.
Marin Conservation League
Natural Parks and Conservation Association
Natural Resource Defense Council
The Nature Conservancy
Oceanic Society
Planning and Conservation League
Save San Francisco Bay Association
San Francisco Bay Planning and Urban Renewal Association
SCOPE
Society for California Archeology
Audubon Society
 Golden Gate Chapter
 Marin Chapter
 Western Regional Office

Sierra Club
 San Francisco Bay Chapter

Associated Sportsmen of California
California Trout
Trout Unlimited
California Marine Affairs and Navigation Conference

o. Individuals

Mr. Tom Corneto
Easly and Brassey Corporation
Bay Land Area Study Team
Ms. Carol Peltz
Mr. Harry Silcocks
J. D. Moulding

6.06 Local Authorization. The proposed activity would require an amendment to the General Plan and a change in zoning by the City of Novato. To date, the City has not taken final action on the proposal. "Where the required Federal, State and/or local certification and/or authorization has been denied, the application for a Department of the Army permit will be denied without prejudice to the right of the applicant to reinstate processing of his application if subsequent approval is received...(33 CFR 320.4(j)(i)(1977))."

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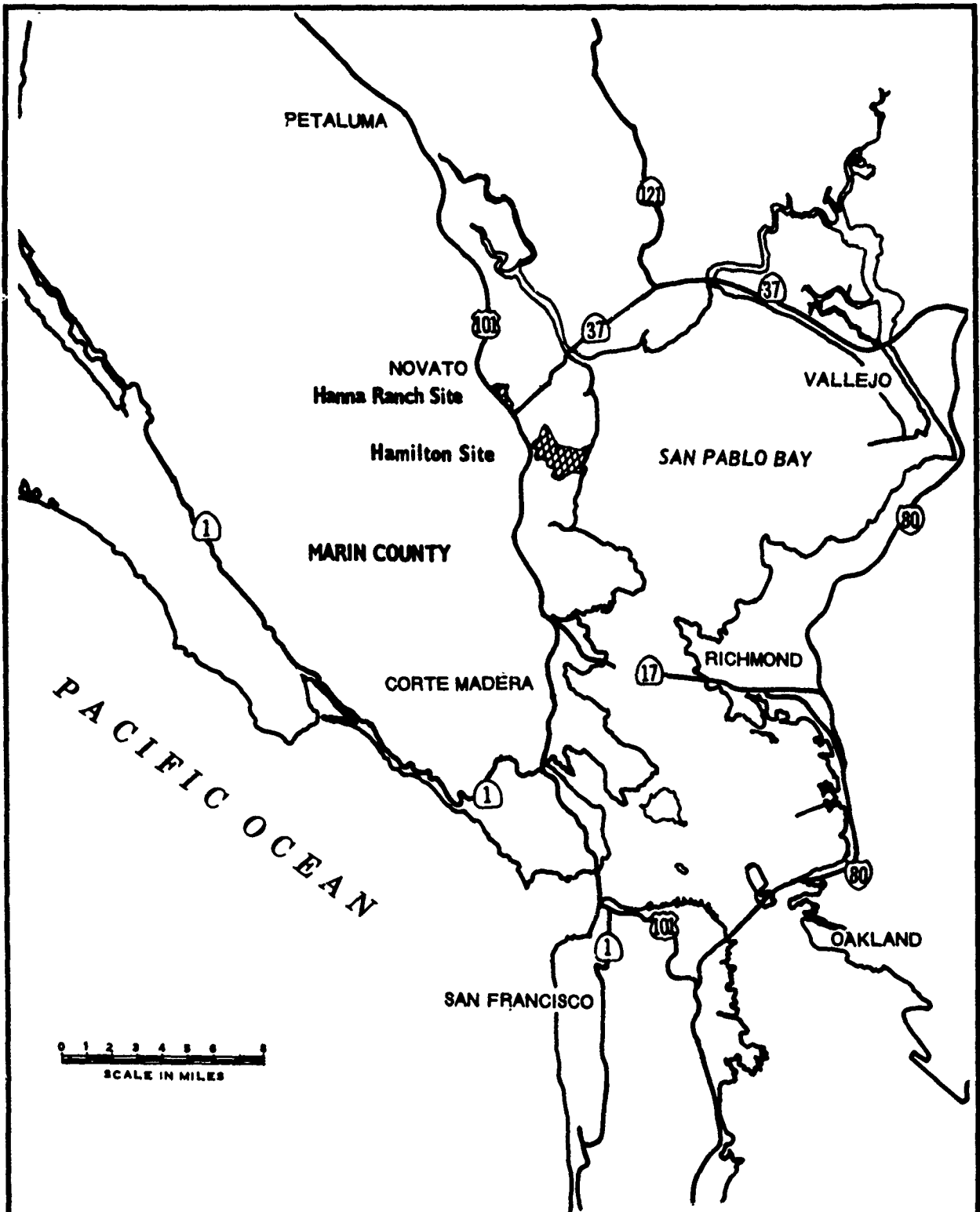
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Paul Portch	Geography	2 years, Permit Impact Assessment Section, Environmental Branch, S.F. District, Corps of Engineers	Environmental Protection Specialist
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PLATES



ENVIRONMENTAL STATEMENT

MARIN COUNTY

CALIFORNIA

NOVATO CENTER

REGIONAL SETTING

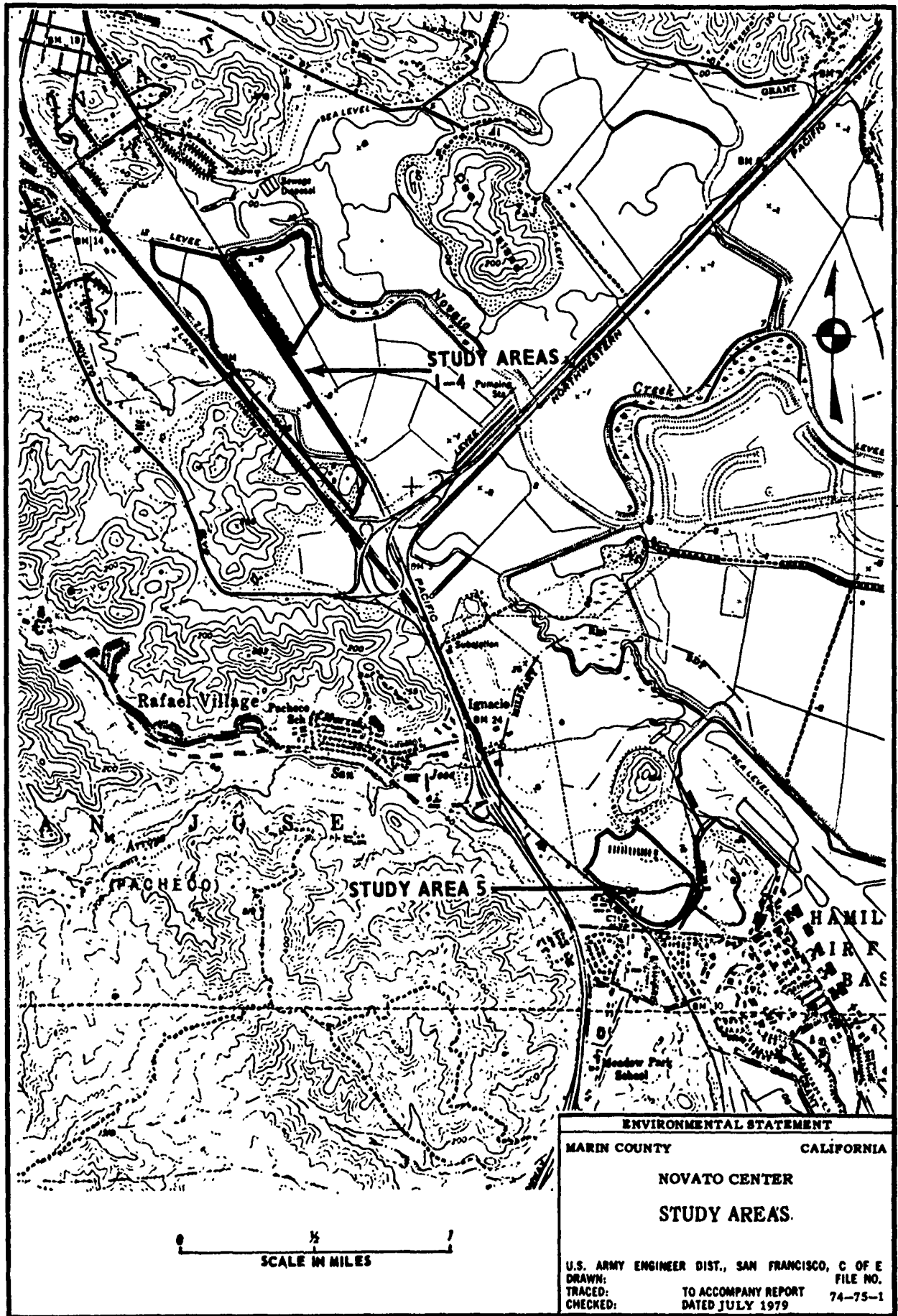
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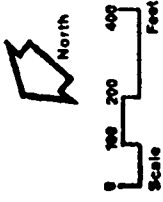
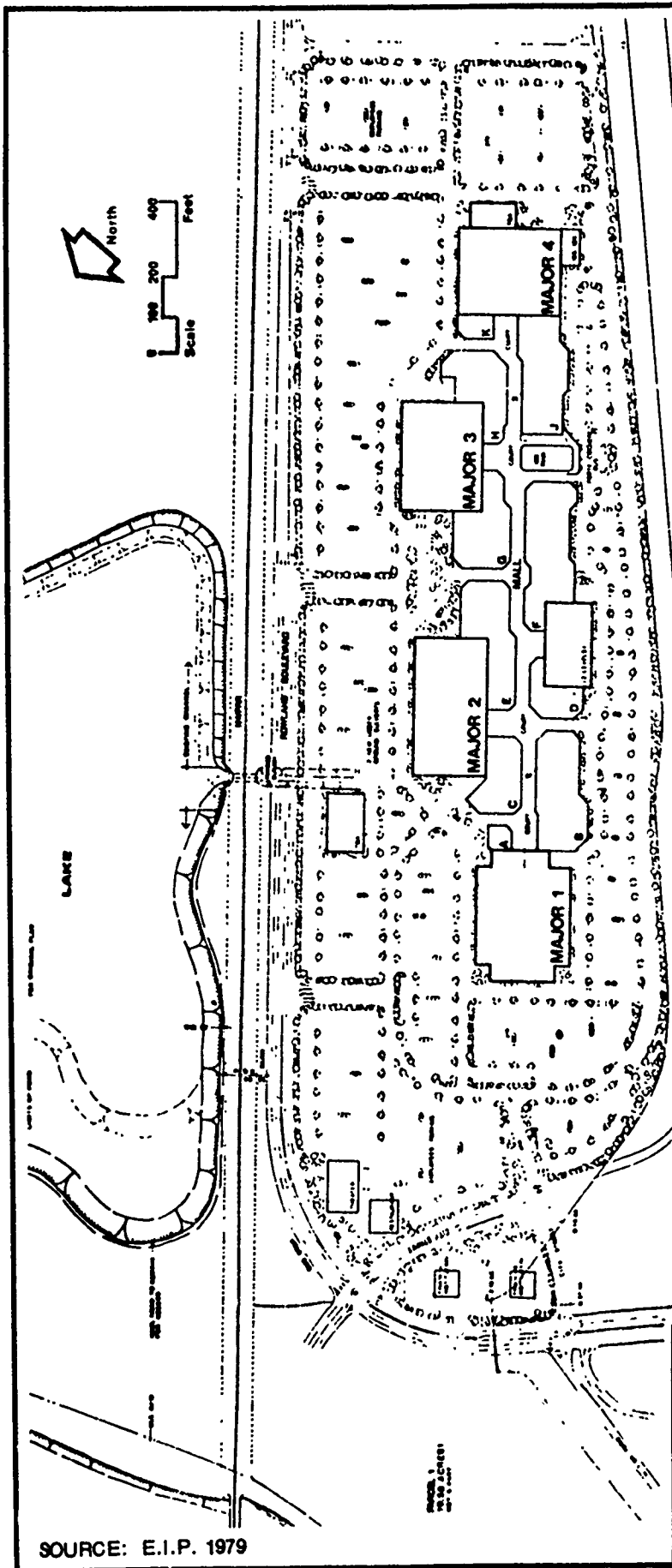
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TRACED: TO ACCOMPANY REPORT 74-75-1

CHECKED: DATED JULY 1979

PLATE 1





SOURCE: E.I.P. 1979

SITE: 1007 0000-001-001-010000
 PROJECT SITE: 7177 0000-000-000-000000 (LANDSCAPE BOUND) 70.70 ACRES

BUILDING AREA	GLA	GLA
MAJOR 1 (10 Bays)	170,000 sq ft	170,000 sq ft
MAJOR 2 (12 Bays)	80,000	80,000
MAJOR 3 (12 Bays)	13,000	13,000
MAJOR 4 (12 Bays)	80,000	80,000
MAJOR 5 (12 Bays)	142,000	142,000
MAJOR 6 (12 Bays)	142,000	142,000
MAJOR 7 (12 Bays)	142,000	142,000
MAJOR 8 (12 Bays)	142,000	142,000
MAJOR 9 (12 Bays)	142,000	142,000
MAJOR 10 (12 Bays)	142,000	142,000
MAJOR 11 (12 Bays)	142,000	142,000
MAJOR 12 (12 Bays)	142,000	142,000
MAJOR 13 (12 Bays)	142,000	142,000
MAJOR 14 (12 Bays)	142,000	142,000
MAJOR 15 (12 Bays)	142,000	142,000
MAJOR 16 (12 Bays)	142,000	142,000
MAJOR 17 (12 Bays)	142,000	142,000
MAJOR 18 (12 Bays)	142,000	142,000
MAJOR 19 (12 Bays)	142,000	142,000
MAJOR 20 (12 Bays)	142,000	142,000
MAJOR 21 (12 Bays)	142,000	142,000
MAJOR 22 (12 Bays)	142,000	142,000
MAJOR 23 (12 Bays)	142,000	142,000
MAJOR 24 (12 Bays)	142,000	142,000
MAJOR 25 (12 Bays)	142,000	142,000
MAJOR 26 (12 Bays)	142,000	142,000
MAJOR 27 (12 Bays)	142,000	142,000
MAJOR 28 (12 Bays)	142,000	142,000
MAJOR 29 (12 Bays)	142,000	142,000
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MAJOR 34 (12 Bays)	142,000	142,000
MAJOR 35 (12 Bays)	142,000	142,000
MAJOR 36 (12 Bays)	142,000	142,000
MAJOR 37 (12 Bays)	142,000	142,000
MAJOR 38 (12 Bays)	142,000	142,000
MAJOR 39 (12 Bays)	142,000	142,000
MAJOR 40 (12 Bays)	142,000	142,000
MAJOR 41 (12 Bays)	142,000	142,000
MAJOR 42 (12 Bays)	142,000	142,000
MAJOR 43 (12 Bays)	142,000	142,000
MAJOR 44 (12 Bays)	142,000	142,000
MAJOR 45 (12 Bays)	142,000	142,000
MAJOR 46 (12 Bays)	142,000	142,000
MAJOR 47 (12 Bays)	142,000	142,000
MAJOR 48 (12 Bays)	142,000	142,000
MAJOR 49 (12 Bays)	142,000	142,000
MAJOR 50 (12 Bays)	142,000	142,000
MAJOR 51 (12 Bays)	142,000	142,000
MAJOR 52 (12 Bays)	142,000	142,000
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MAJOR 56 (12 Bays)	142,000	142,000
MAJOR 57 (12 Bays)	142,000	142,000
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MAJOR 97 (12 Bays)	142,000	142,000
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MAJOR 100 (12 Bays)	142,000	142,000

Novato Regional Shopping Center

ENVIRONMENTAL STATEMENT

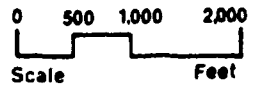
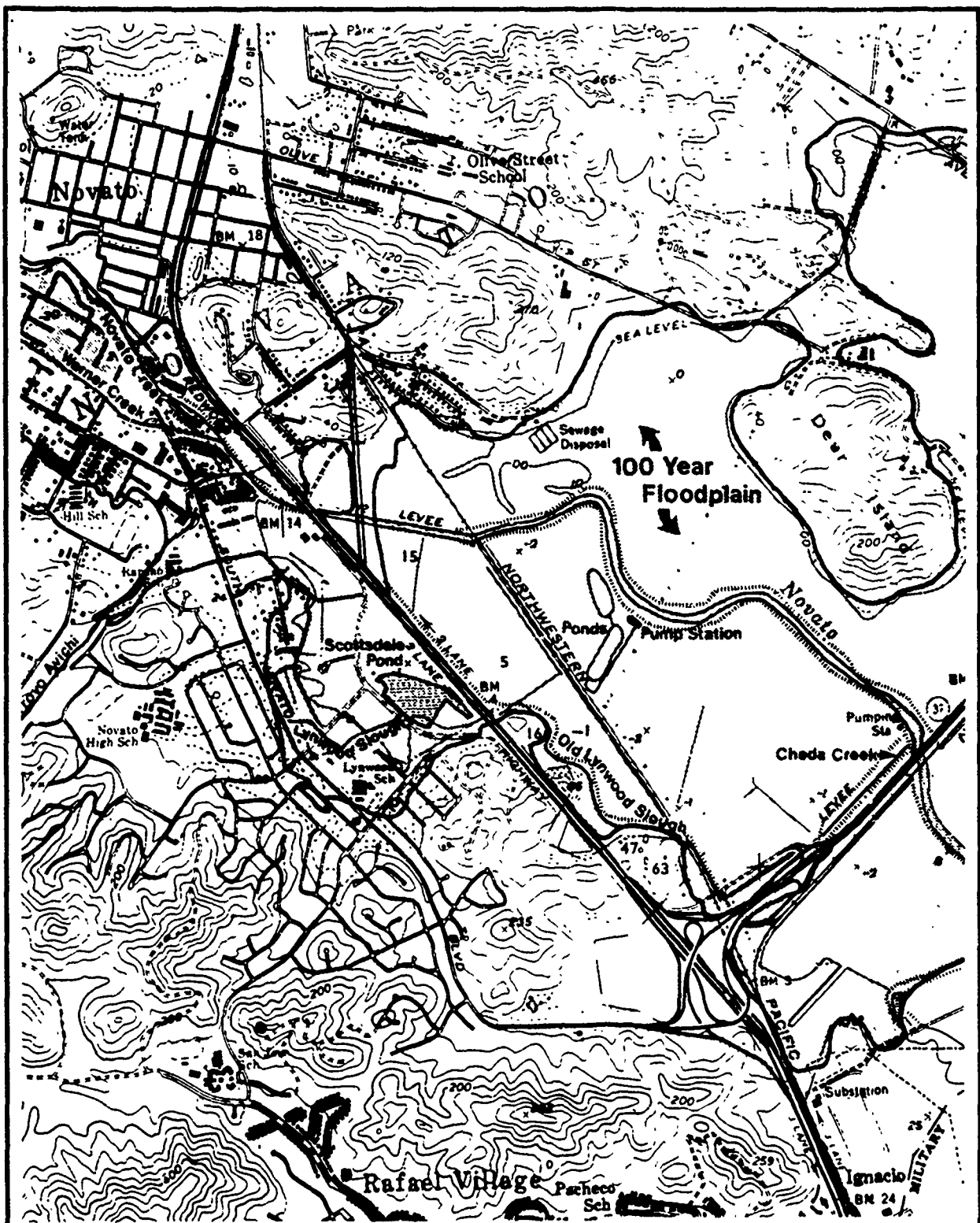
MARIN COUNTY CALIFORNIA

NOVATO CENTER
 SITE PLAN
 ALTERNATIVE #2

U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E
 DRAWN: [Name] FILE NO.
 TRACED: [Name]
 CHECKED: [Name]

TO ACCOMPANY REPORT
 DATED JULY 1979 74-75-1

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 MAJOR 4 (12 Bays) 80,000
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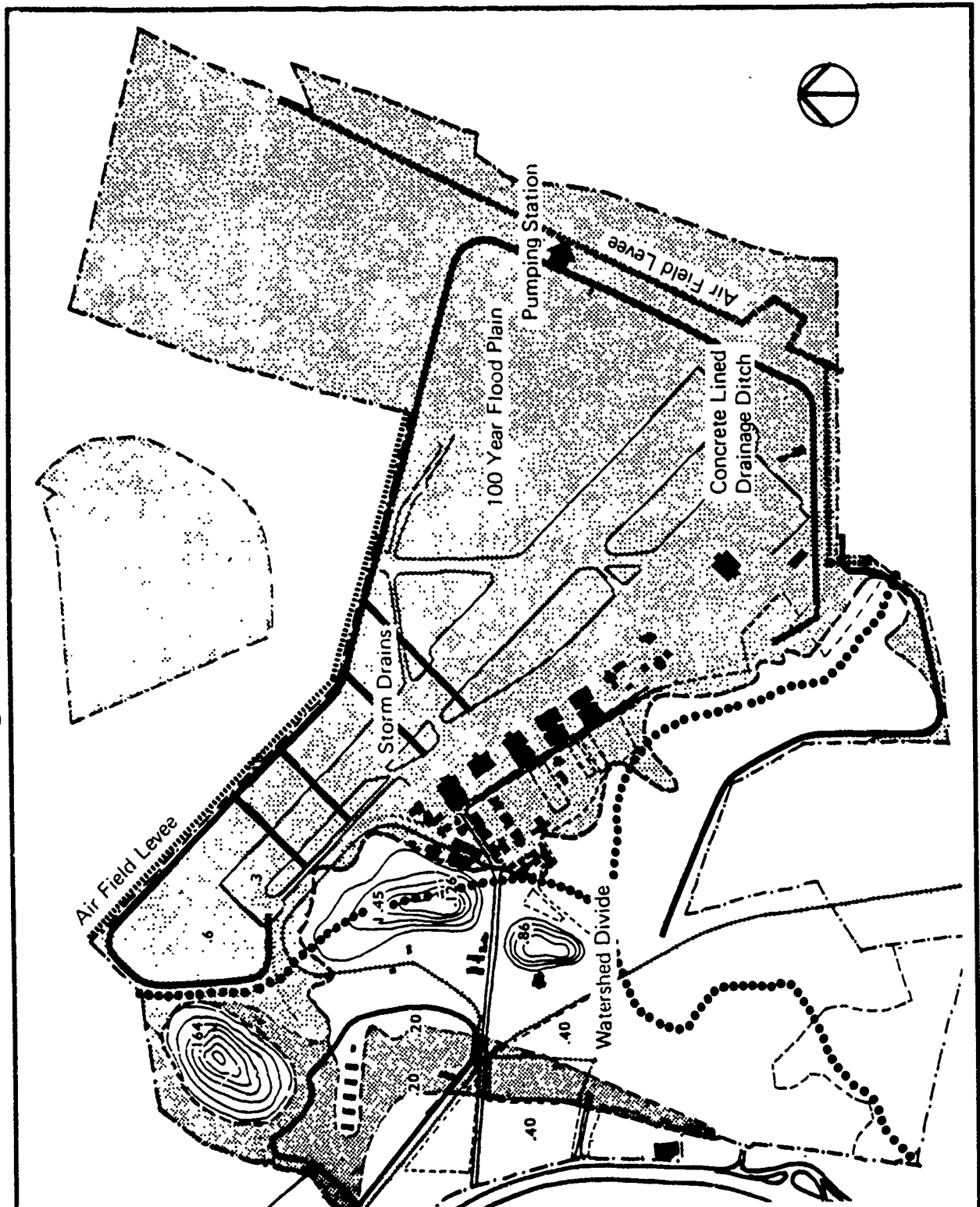
ADAPTED FROM: F.I.A. FIRM MAPS 1978

ENVIRONMENTAL STATEMENT

MARIN COUNTY CALIFORNIA

**NOVATO CENTER
100 - YEAR FLOOD PLAIN
ALTERNATIVES #1-4**

U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E
 DRAWN: FILE NO.
 TRACED: TO ACCOMPANY REPORT
 CHECKED: DATED JULY 1979 74-75-1

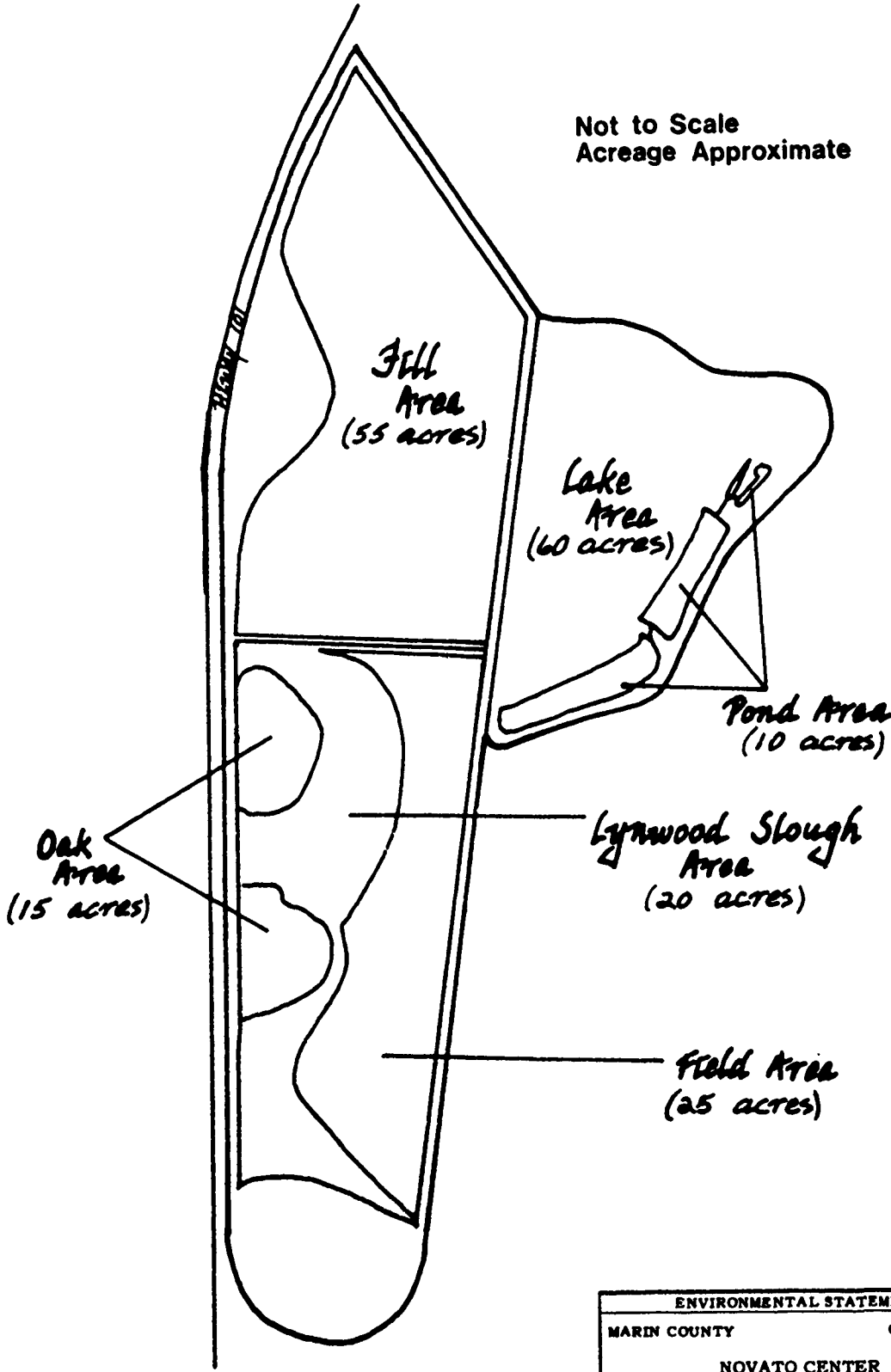


STUDY AREA 5

ADAPTED FROM:
 AEROSPACE DEFENSE COMMAND MASTER PLAN
 DETAIL UTILITIES MAP

ENVIRONMENTAL STATEMENT	
MARIN COUNTY	CALIFORNIA
NOVATO CENTER 100 - YEAR FLOOD PLAIN ALTERNATIVE #5	
U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E	FILE NO.
DRAWN:	TO ACCOMPANY REPORT
TRACED:	DATED JULY 1979
CHECKED:	74-75-1

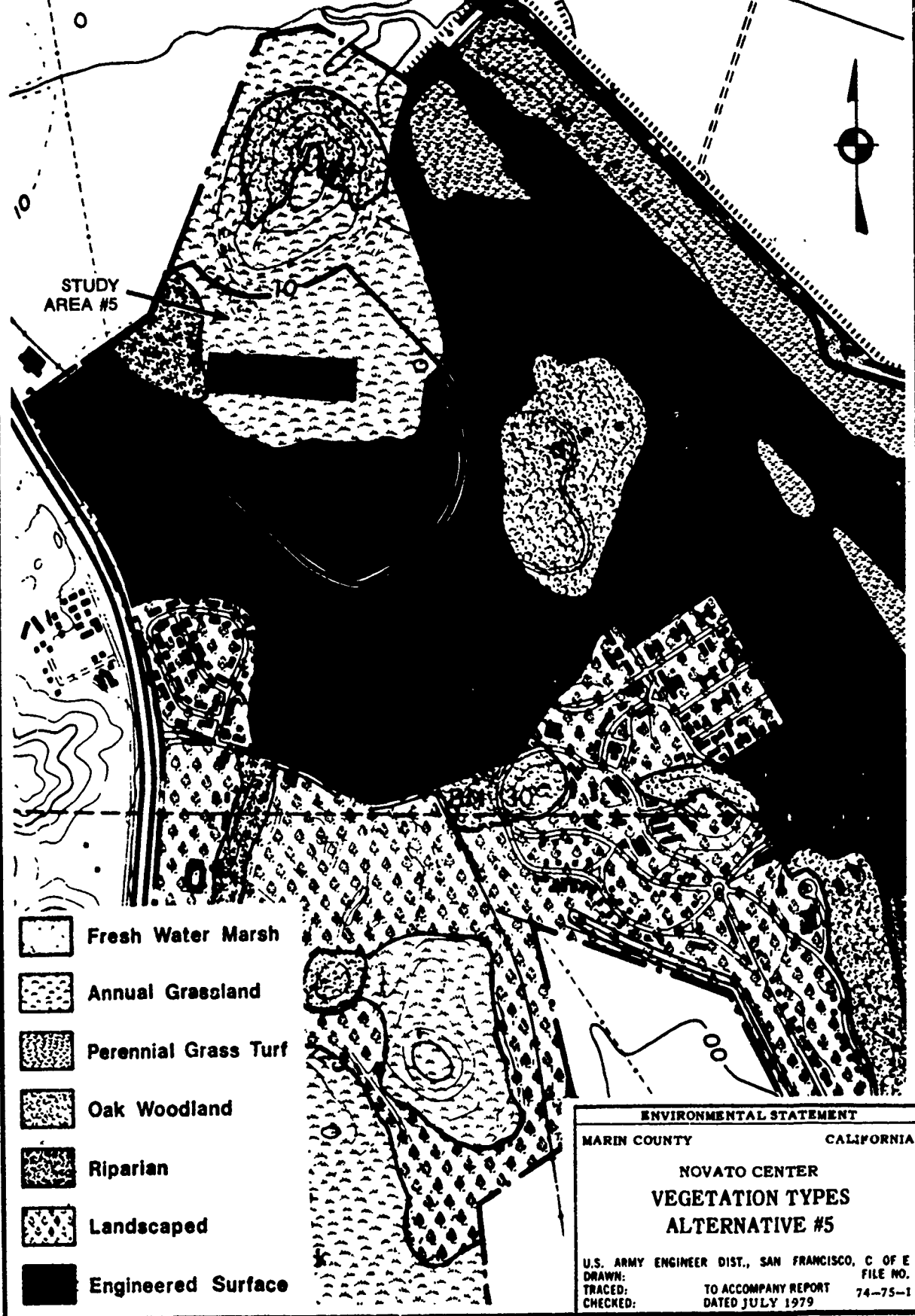
Not to Scale
Acreage Approximate










SOURCE: E.I.P. 1979

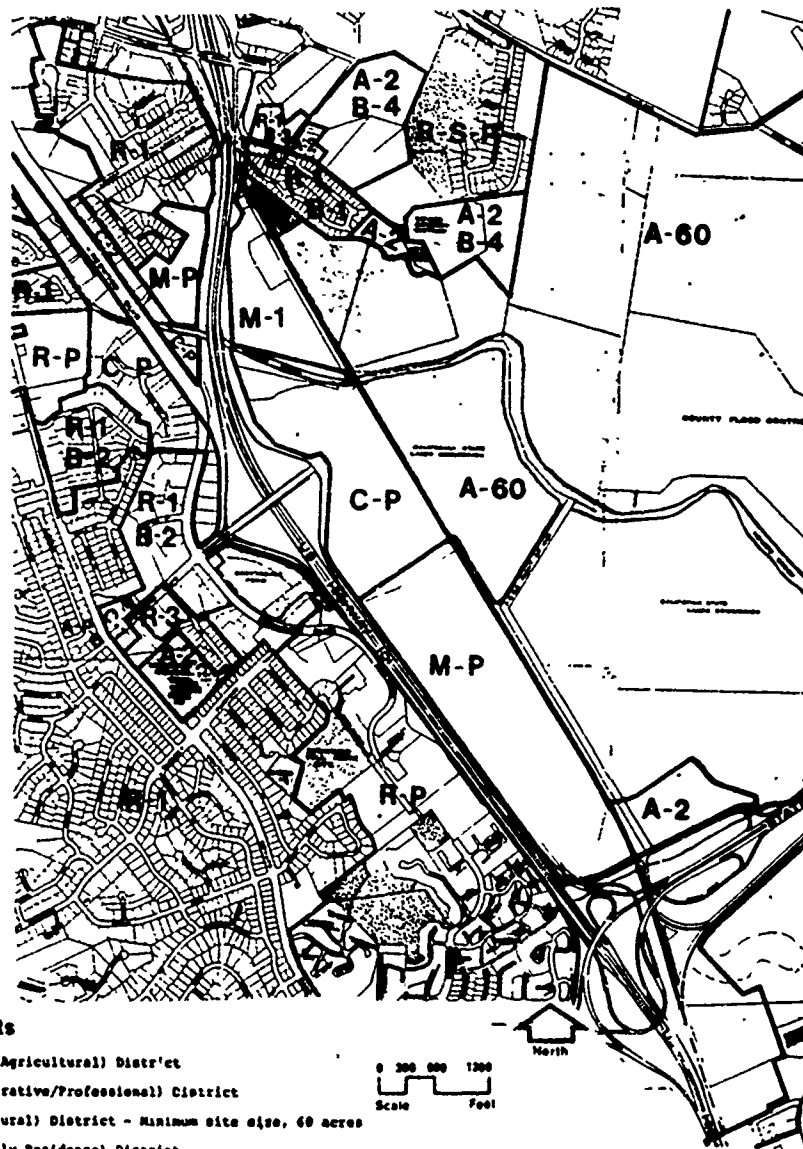
ENVIRONMENTAL STATEMENT	
MARIN COUNTY	CALIFORNIA
NOVATO CENTER HABITAT ZONES ALTERNATIVES #1-4	
U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C. OF E	FILE NO.
DRAWN:	74-75-1
TRACED:	TO ACCOMPANY REPORT
CHECKED:	DATE: JULY 1979

SOURCE:
U.C. ENVIRONMENTAL STUDY GROUP 1976



-  Fresh Water Marsh
-  Annual Grassland
-  Perennial Grass Turf
-  Oak Woodland
-  Riparian
-  Landscaped
-  Engineered Surface

ENVIRONMENTAL STATEMENT
MARIN COUNTY CALIFORNIA
NOVATO CENTER
VEGETATION TYPES
ALTERNATIVE #5
U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E
DRAWN: FILE NO.
TRACED: TO ACCOMPANY REPORT 74-75-1
CHECKED: DATED JULY 1979



Zone Districts

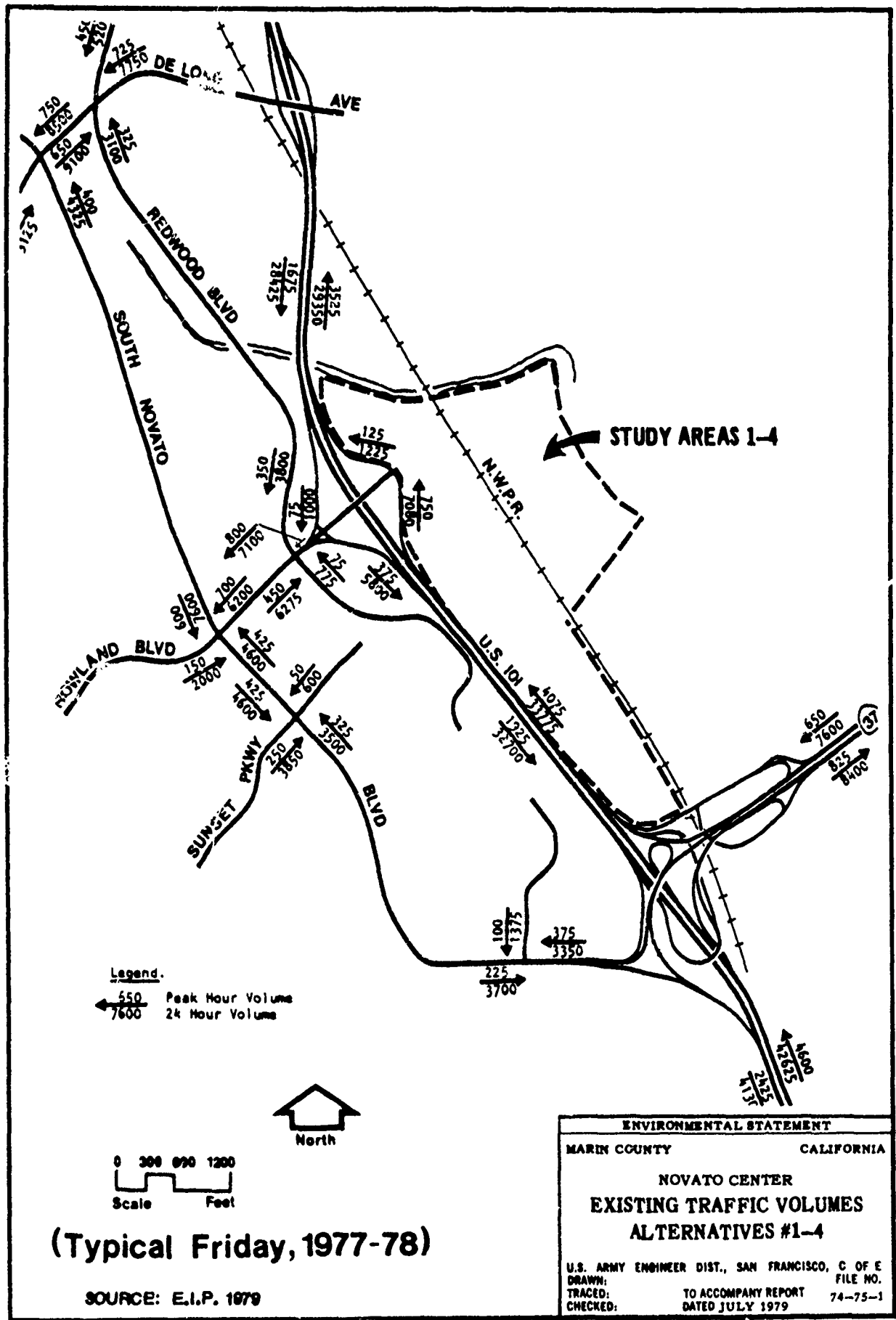
- A-2 (Limited Agricultural) District
- A-P (Administrative/Professional) District
- A-60 (Agricultural) District - Minimum site size, 60 acres
- R-1 (One Family Residence) District
- R-3 (Multiple Residence) District
- R-P (Planned Residential) District
- R-S-P (Residential-Single Family Planned) District
- C-2 (General Commercial) District
- C-P (Planned Commercial) District
- M-1 (Light Industrial) District
- M-P (Planned Industrial) District

Building Site Area Regulations

- B-1 building site area, six thousand square feet.
- B-2 building site area, ten thousand square feet.
- B-3 building site area, twenty thousand square feet.
- B-4 building site area, one acre.

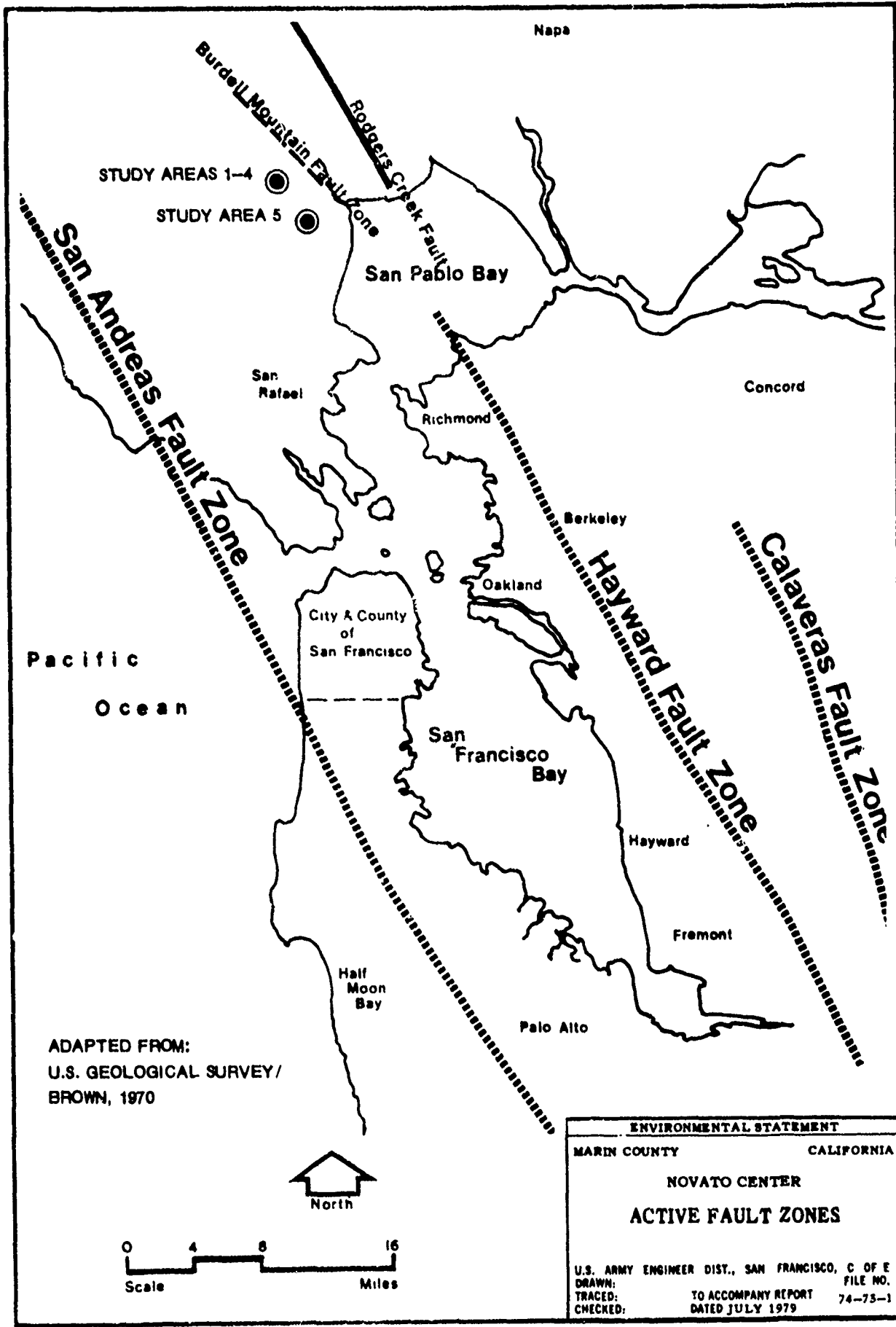
SOURCE: E.I.P. 1979

ENVIRONMENTAL STATEMENT	
MARIN COUNTY	CALIFORNIA
NOVATO CENTER ZONING DESIGNATIONS ALTERNATIVES #1-4	
U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E	
DRAWN:	FILE NO.
TRACED:	TO ACCOMPANY REPORT
CHECKED:	DATED JULY 1979 74-75-1



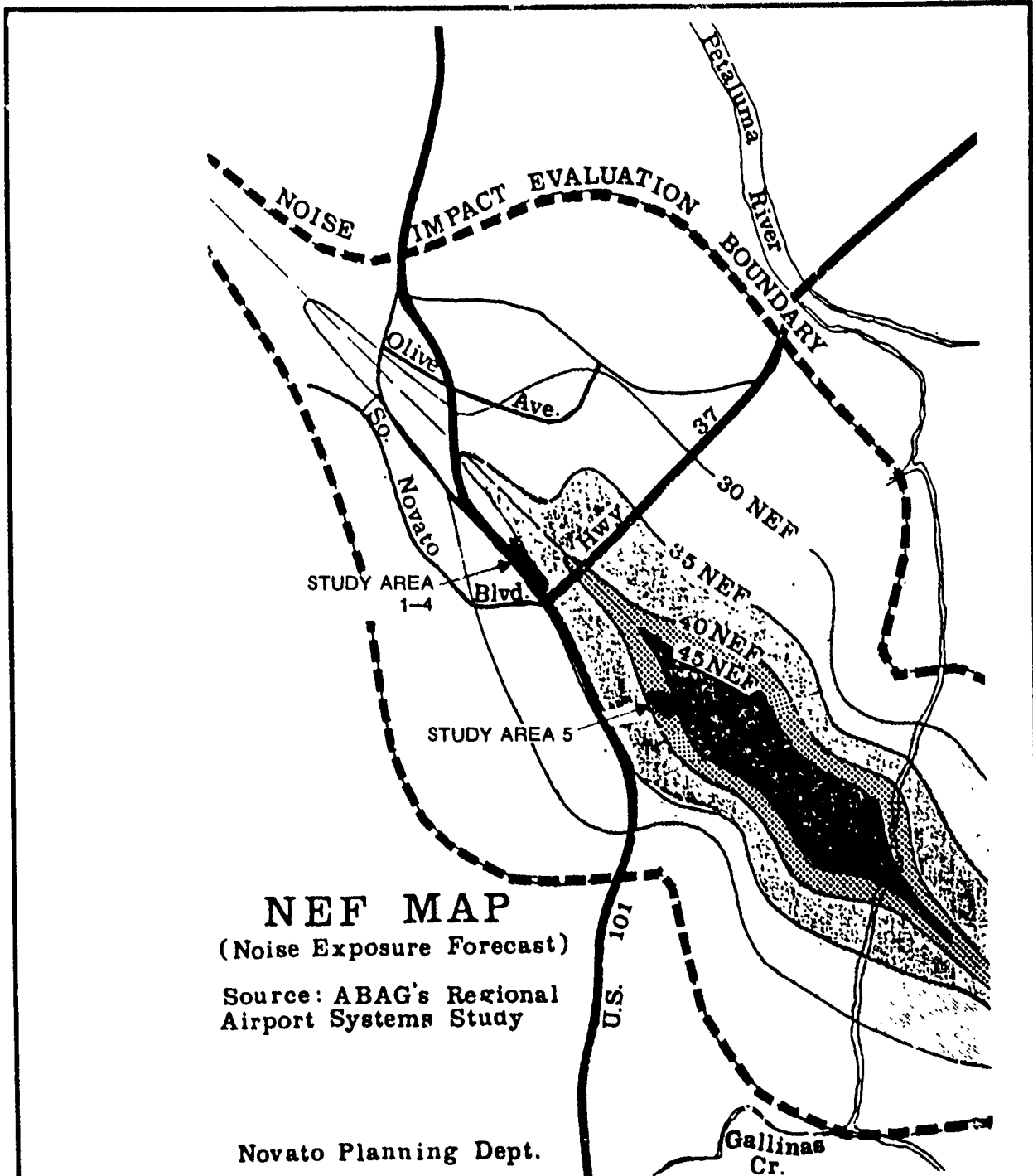
(Typical Friday, 1977-78)

SOURCE: E.I.P. 1979



ADAPTED FROM:
 U.S. GEOLOGICAL SURVEY/
 BROWN, 1970

ENVIRONMENTAL STATEMENT	
MARIN COUNTY	CALIFORNIA
NOVATO CENTER	
ACTIVE FAULT ZONES	
U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E	
DRAWN:	FILE NO.
TRACED:	74-75-1
CHECKED:	TO ACCOMPANY REPORT DATED JULY 1979

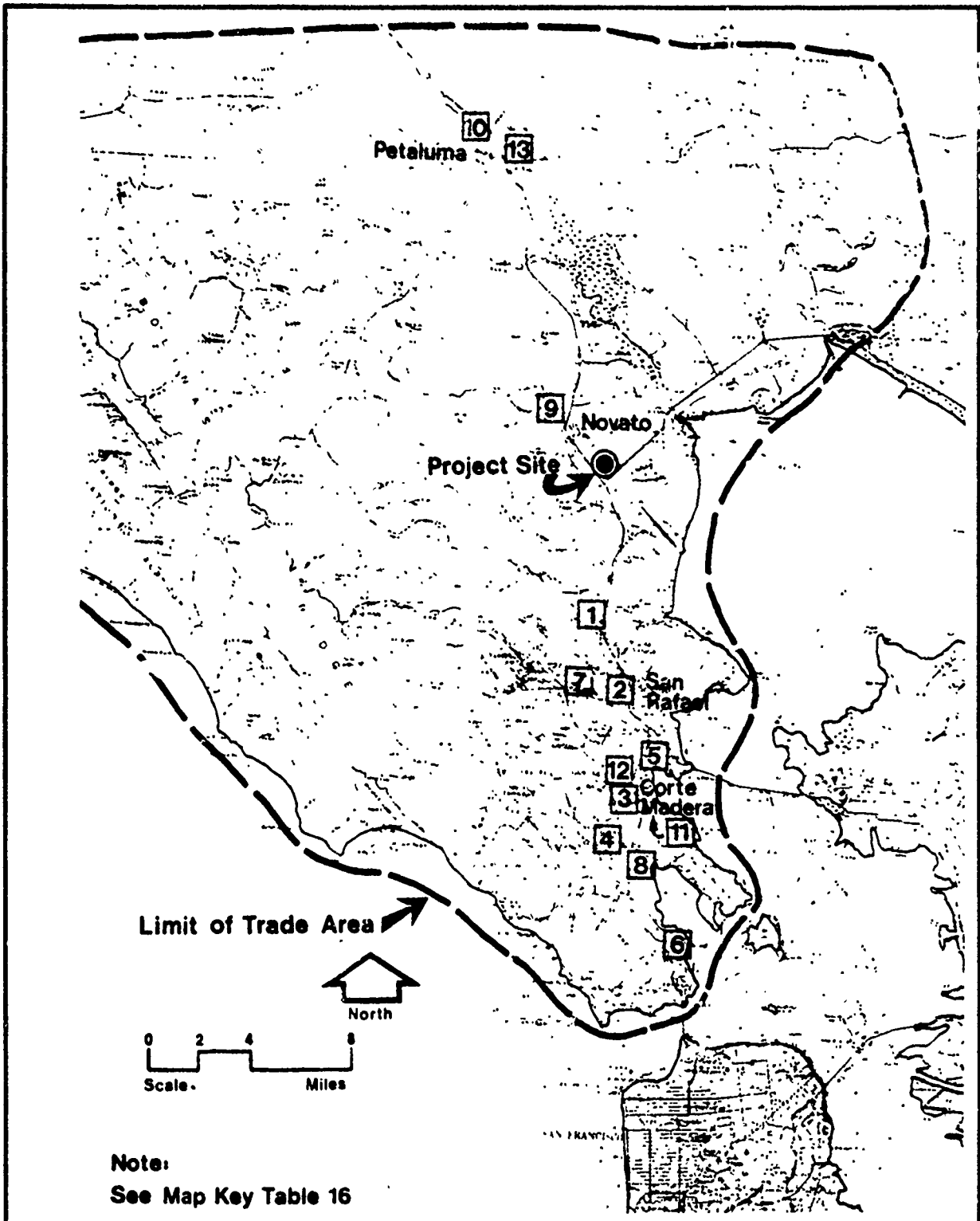


NEF MAP
 (Noise Exposure Forecast)
 Source: ABAG's Regional
 Airport Systems Study

Novato Planning Dept.



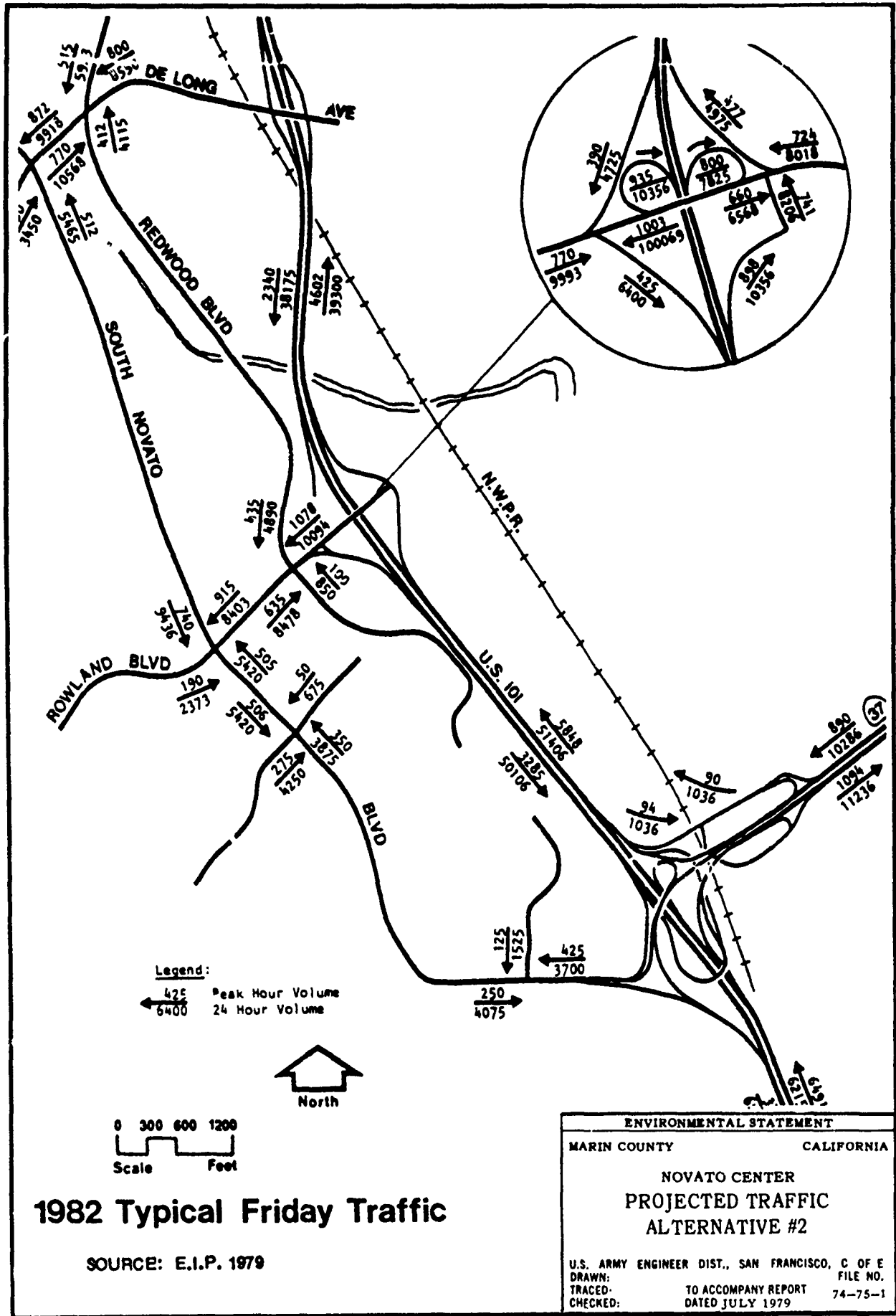
ENVIRONMENTAL STATEMENT	
MARIN COUNTY	CALIFORNIA
NOVATO CENTER	
NOISE CONTOUR MAP	
U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E	
DRAWN:	FILE NO.
TRACED:	TO ACCOMPANY REPORT
CHECKED:	DATED JULY 1979 74-75-1



Note:
See Map Key Table 16

Source: Keyser Marston Assoc., 1978

ENVIRONMENTAL STATEMENT	
MARIN COUNTY	CALIFORNIA
NOVATO CENTER TRADE AREA AND COMPETITIVE CENTERS	
U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E	
DRAWN:	FILE NO.
TRACED:	TO ACCOMPANY REPORT
CHECKED:	DATED JULY 1979
	74-75-1



APPENDIX A
AIR QUALITY ANALYSIS

APPENDIX A

NOVATO CENTER AIR QUALITY

INTRODUCTION

The Clean Air Act Amendments of 1970 require that each state submit an Implementation Plan to the U.S. Environmental Protection Agency (EPA) outlining the control strategy that will be used by the State to attain and/or maintain the Ambient Air Quality Standards. An implementation plan thus becomes a vehicle for the air quality planning effort for a region (air basin). Elements of the implementation plan must provide for land use and transportation controls, air quality monitoring, and a procedure for review of future development to determine its impact upon the air quality in a region. In a revision to the State of California Implementation Plan, the State Air Resources Board recommended to EPA that the San Francisco Bay Area be designated as an Air Quality Maintenance Area (AQMA) for carbon monoxide, total suspended particulates, and oxidants since the Ambient Air Quality Standards are not expected to be met by the target year of 1982. To realize significant, long-term controls over areas with air pollution problems (AQMA's), a detailed air quality analysis is required for all developments proposed within an AQMA to evaluate the projects' impact on the air quality in the region.

Implementation of the proposed project would result in commercial development, specifically a regional shopping center. The primary source of emissions related to the proposed project are motorized vehicles. Therefore, an air quality analysis for these vehicles has been performed to quantitatively determine project-related emissions of air pollutants and to evaluate the impact upon the air quality in the air basin. The analysis considered the following pollutants: carbon monoxide, hydrocarbons, nitrogen dioxide, sulfur dioxide and total suspended particulates. The precursors of oxidants, hydrocarbons and nitrogen dioxide, were considered due to the difficulty in modeling for oxidants.

BASIC DATA AND ASSUMPTIONS

To perform an air quality analysis, certain basic data are required to compute pollutant emissions resulting from a proposed project. In this air quality analysis, as in most analyses, a large percentage of the basic information was not available. Due to fiscal and temporal constraints, certain assumptions about existing and future conditions had to be made in order to complete the analysis. This analysis quantitatively considered Alternatives #1, #2, #3, and #5. Alternative #4 was not quantitatively considered due to the lack of project details for the various development possibilities. However, Alternative #4 was considered qualitatively and is discussed on page 52 of the main report. The data and assumptions used in this air quality analysis are discussed in the paragraphs that follow.

Alternatives #1, #2, and #3. The year 1982 was selected as the year for the air quality analysis since the proposed Novato Center is expected to be in operation at this date. The Bay Area Air Quality Management District (BAAQMD), formerly called the Bay Area Air Pollution Control District, background emission projections exist for 1985. The 1982 projected background emissions used in this analysis were derived through interpolation.

The daily trip ends (a trip end is the origin or destination of a trip; each trip thus consists of two trip ends; however in the case of a shopping center such as Novaco Center it is assumed that a trip end is equivalent to a trip since most trip ends occur outside the project site) generated by the project-related traffic were calculated using the trip generation factors contained in the Novato Regional Shopping Center Draft Environmental Report (NRSCDER), dated March 1979. The trips generated by the proposed project are shown on Table A-1.

The 1982 traffic volumes for the various links (roadway) shown in Table A-2 are based on projections contained in the NRSCDER. The location of these links are shown on Plates A-1 and A-2. The project related traffic was assigned to the various links per the NRSCDER.

Alternative #5. The year 1985 was selected for the air quality analysis since it was considered a feasible date for project development. The BAAQMD's 1985 background emissions were used in the calculations. The daily trip ends generated by the project-related traffic were calculated using the trip generation factors contained in the NRSCDER. The trips generated by the proposed project are shown on Table A-1.

The 1985 traffic volumes for the various links (roadway) shown in Table A-9 are based on projections contained in the Draft Environmental Impact Statement on Disposition and Use of Federal Surplus Property at Hamilton Air Force Base, Novato, California (DEISDUFSPHAFB) dated April, 1979. The location of these links are shown on Plate A-1. The project related traffic was assigned to the various links as noted in Table A-9.

METHODOLOGY

The analysis of the air quality impact presented herein basically follows the methodology developed by the Bay Area Air Quality Management District (BAAQMD), as described in its Information Bulletin titled Guidelines for Air Quality Impact Analysis (Bay Area Air Pollution Control District, 1975). In accordance with the BAAQMD guidelines, air quality impact computations were made for project-related pollutant emissions in terms of: (1) line source impact, i.e., pollutant concentration along and immediately adjacent to the most heavily traveled links (roadways) in the traffic circulation system of the project area; (2) area source impact, i.e., pollutant concentrations in the immediate air basin, one-kilo-meter square areas centered on the project site; and (3) regional impact, i.e., pollutant concentrations contributed by project-related emissions to the regional air basin.

The vehicle emission factors used in this analysis are shown in Table A-3 and were derived through interpolation of the Environmental Protection Agency's MOBILE 1 1975 Base and 1985 Projected emission factor data as obtained from the BAAQMD.

Table 1, (average vehicle emission factors for the San Francisco Bay Area vehicle mix) of the Guidelines for Air Quality Impact Analysis was not used since the factors are no longer valid.

LINE SOURCE ANALYSIS

The purpose of the line source analysis is two-fold. First, it evaluates the probable impact of project-related emissions along the link (roadway) under investigation. Second, it evaluates the probable impact of project-related emissions upon points immediately downwind from the link. These points known as sensitive receptors are defined as buildings and areas where people would be spending more than two or three hours at a time (Bay Area Air Pollution Control District, 1975).

Carbon monoxide (CO) concentrations are used for the line source computations since, if the CO concentrations do not exceed the standards, it is improbable that the standards for the other pollutants would be exceeded.

Alternatives #1, #2, and #3. Line source impact computations were performed for each link to determine the concentrations of CO along the most heavily traveled roads inside the Universal Transverse Mercator (UTM) grid square. The results of these computations are summarized in Table A-5. With the exception of four links (L-2, L-13, L-17, and L-22) existing CO concentrations are substantially below the standards for the 1-hour averaging time and no links exceed the standards for the 8-hour averaging time. The four links that exceed the CO concentration standards for the 1-hour averaging time under existing conditions are road segments of U.S. 101. Links numbered L-2, L-13, and L-22 exceed the 1-hour averaging time standard by 54% and L-17 exceeds the standard by 33%.

In 1982 under the "Without Project" condition there is a slight improvement in the level of CO concentrations despite the growth in traffic. This would be primarily due to improvements of vehicular emission control systems. However, the 1982 "Without Project" condition still shows U.S. 101, represented by links numbered L-2, L-13, L-17, and L-22, exceeding the standard for the 1-hour averaging time by 13% to 31%.

The 1982 "Project Only" condition shows that CO concentrations attributed to the proposed project generated traffic would in no instance exceed the standards for the 1-hour and 8-hour averaging times. The "Project Only" 1-hour and 8-hour averaging time concentrations would at most amount to 33% and 19% of the standards, respectively.

The 1982 "With Project" CO concentrations do not exceed the standards except for the links associated with U.S. 101 (L-2, L-13, L-17, and L-22) for the 1-hour averaging time. These four links exceed the 1-hour standard by 24% to 63% of which 9% and 20%, respectively, are contributed by the "Project Only". Excluding the U.S. 101 links, the "With Project" CO concentrations at most amount to 28% of the 1-hour standard and 19% of the 8-hour standard. The "Project Only" impact on the "With Project" condition ranges from a low of 6% to a high of 100% for both the 1-hour and 8-hour averaging times. Those links showing an impact of 100% represent road segments that would only be built as part of the proposed project.

In summary, of the four links associated with U.S. 101 (links L-2, L-13, L-17, and L-22) under the "With Project" condition that exceed the 1-hour averaging time standard by 24% to 63%, the "Project Only" impact would account for 9% and 20%, respectively, of the total concentration. It is significant that CO concentrations for these links exceed the 1-hour averaging time standard for existing as well as the future "Without" and "With" proposed project conditions. The line source impact of project related CO emissions for the remaining links ranges from 6% to 100% with no link concentrations exceeding the standards.

The line source impact analysis also involves an evaluation of the effect of project-related emissions upon sensitive receptors. Sensitive receptors include schools, playgrounds, hospitals, nursing homes, residences or those sites where pollutant-sensitive human receptors might conceivably spend one or more hours within 100 meters of the subject road source. The area east of U.S. 101 lacks any sensitive receptors since it is undeveloped. However, sensitive receptors exist to the west of U.S. 101. There are many residences, some of which are very close to both Redwood Boulevard and U.S. 101 traffic. In this analysis computations of carbon monoxide concentrations at distances of 5, 20, and 100 meters from the various links are used rather than actual receptors. The results of the computations are summarized in Table A-6 (1-hour averaging time) and Table A-7 (8-hour averaging time). The 1-hour averaging time concentrations at the 5 meter distance exceed the standard for three links (L-2, L-13, and L-22) under the existing as well as the 1982 "With Project" condition. The proposed project would be responsible for these links exceeding the standards as the "Without Project" concentrations are less than the standards but the "With Project" concentrations exceed the standard by 14% for link L-2 and by 16% for link L-13 and L-22. All the other link concentrations are less than the standard and in no case would these concentrations exceed 88% of the standard for the 1-hour averaging time.

Table A-7 concentrations for the 8-hour averaging time in no instance exceed the standard. The "worst case" "With Project" concentration is 53% of the standard and this is only for those links comprising U.S. 101. By excluding the U.S. 101 links then CO concentrations in no case exceed 13% of the standard.

Concentrations at sensitive receptors located 5 meters in distance from U.S. 101 links exceed the standard for the 1-hour averaging time due to the proposed project. While this may be considered significant, in actuality there are currently no (and it is reasonable to assume none in the future) residences or other sensitive receptors within 5 meters of U.S. 101. Concentrations at sensitive receptors located 5, 20, and 100 meters from the other links do not exceed the standards.

Alternative #5. The results of the line source impact computations are summarized in Table A-11. With the exception of two links (L-1 and L-5) existing CO concentrations are substantially below the standard for the 1-hour averaging time and no links exceed the standard for the 8-hour averaging time. The two links that exceed the CO concentration standard for the 1-hour averaging time under existing conditions are road segments of U.S. 101. These two road links exceed the 1-hour averaging time standard by 241%.

The 1985 "Without Project" condition indicates improvement in the CO concentration levels despite the growth in traffic. This decrease in CO concentrations would be primarily due to improvements of vehicular emission control systems. However, the 1985 "Without Project" condition still shows U.S. 101 (links L-1 and L-5) exceeding the 1-hour averaging time standard by 151%.

The 1985 "Project Only" condition shows that CO concentrations attributed to the proposed project generated traffic would in no instance exceed the standards for the 1-hour and 8-hour averaging times. The "Project Only" 1-hour and 8-hour averaging time concentrations would at most amount to 44% and 40% of the standards, respectively.

The 1985 "With Project" CO concentrations do not exceed the standards except for the links associated with U.S. 101 (L-1 and L-5). However, the proposed project has no impact on these two links. Excluding L-1 and L-5, the "With Project" CO concentrations at most amount to 50% of the 1-hour standard and 69% of the 8-hour standard. The "Project Only" impact on the "With Project" condition ranges from a low of 64% to a high of 92% of the 1-hour and 8-hour averaging time standards, inclusive.

In summary, the "Project Only" condition does not impact the U.S. 101 links which exceed the 1-hour averaging time standard for both the existing and future conditions. The line source impact of project related CO emissions for links L-2, L-3, L-4, and L-6 ranges from 64% to 92% with no link concentrations exceeding the standards.

The line source impact analysis also involves an evaluation of the effect of project-related emissions upon sensitive receptors. The primary sensitive receptor is a school east of Nave Drive. In this analysis computations of carbon monoxide concentrations at distances of 5, 20, and 100 meters from the various links are used rather than actual receptors.

The results of the computations are summarized in Table A-12 (1-hour averaging time) and Table A-13 (8-hour averaging time). The 1-hour averaging time concentrations at the 5 and 20 meter distances exceed the standard for two links (L-1 and L-5) under the existing, "Without Project" and "With Project" (except for the 20 meter distance) conditions. The "Project Only" concentrations have no impact on the two links that exceed the standards. All the other link concentrations are less than the standard and in no case would the concentrations exceed 80% of the 1-hour averaging time standard.

Table A-13 concentrations for the 8-hour averaging time do not exceed the standard under any condition. The "worst case" "With Project" concentration is 46% of the standard and this is only for the U.S. 101 links on which the proposed project has no impact.

AREA SOURCE ANALYSIS

The purpose of the area source analysis is to provide an indication of the probable impact of the project-related emissions on the air quality in the local area. The computations used in this analysis are designed to provide an estimate of concentrations of various pollutants produced by project emissions and averaged spatially over the local area. In this analysis the local area for Alternatives #1, #2, and #3 is defined as consisting of four each one square kilometer grids which include the proposed project site and most heavily traveled roads. Alternative #5 consists of two each one square kilometer grids. These six each one square kilometer grids identified as 4214000 north and 539000 meters east, 4215000 meters north and 538000 meters east, and 4216000 meters north and 538000 meters east for Alternatives #1, #2, and #3 and 4212000 meters north and 541000 meters east, and 4211000 meters north and 541000 meters east for Alternative #5 are based on the Universal Transverse Mercator (UTM) grid shown on the Novato Quadrangle, 7.5 Minute Series Topographic Sheet (U.S. Geological Survey, 1968). These grid squares were then super-imposed on the California State Automobile Association Novato and Vicinity Road Map dated March 1978. The location of the six each one square kilometer grids is shown on Plates A-1 and A-2.

Alternatives #1, #2, and #3. Background emissions data for the year 1982, derived through interpolation of 1975 and 1985 emissions data furnished by the BAAQMD, were used for the area source analysis. The average vehicle speed was assumed to be 20, 30, 40, or 50 miles per hour, depending on the road and posted speed limits, with 3 minutes of idling time per trip. The area source analysis assumes a wind speed of 2 meters per second.

The area source impacts, summarized in Table A-8, are indicated as the maximum concentration of air quality standard related contaminants expected to occur during a single year as the result of project-related emissions. Impact calculations are based on simplified manual dispersion calculations and statistical techniques with conservative input values.

Table A-8 indicates that all pollutant concentrations except Hydrocarbons (HC) and Nitrogen Dioxide (NO₂) are well within the limits specified by the Ambient Air Quality Standards. The total concentrations (background plus proposed project emissions) of HC for the 3-hour averaging time and of NO₂ for the 1-hour and 1-year averaging time would greatly exceed, except for grid-square #4215539 and its NO₂ 1-year concentration, the respective Ambient Air Quality Standards. The HC concentrations for both the background and project conditions, with one exception, exceed the standards and the proposed project's impact on total concentrations may be considered significant, ranging from 17% to 54%.

Background concentrations of NO₂ for both the 1-hour and 1-year averaging time, except for grid-square #4215539, greatly exceed the Ambient Air Quality Standards. The proposed project concentrations never exceed 42% of the standards. However, the proposed project's impact on the total concentrations ranges from 14% to 50% and may be considered significant for all grid-squares except #4215539 for the 1-year averaging time.

Alternative #5. The 1985 background emissions data furnished by the BAAQMD were used for the area source analysis. The average vehicle speed was assumed to be 20 and 50 miles per hour depending on the road and posted speed limits, with 3 minutes of idling time per trip. The area source analysis assumes a wind speed of 2 meters per second.

Table A-14 indicates that all pollutant concentrations except Hydrocarbons (HC) and Nitrogen Dioxide (NO₂) are well within the limits specified by the Ambient Air Quality Standards. The total concentrations (background plus proposed project emissions) of HC for the 3-hour averaging time and of NO₂ for the 1-hour averaging time for gridsquare #4211541 would greatly exceed the respective standards. The HC concentrations for both the background and project conditions, with one exception, exceed the standards and the proposed project's impact on the total concentrations may be considered significant ranging from 39% to 94%.

The background concentration of NO₂ in gridsquare #4211541 for the 1-hour averaging time exceeds the standard. The proposed project concentrations never exceed 35% of the standards. However, the proposed project's impact on the total concentrations ranges from 16% to 86% and may be considered significant.

REGIONAL IMPACT ANALYSIS

Alternatives #1, #2, #3, and #5. The regional impact analysis determines the impact of project-related emissions upon the air quality in the region. The results of the analysis, which are summarized in Table A-8 for Alternatives #1, #2, and #3 and Table A-14 for Alternative #5 show that the project-related emission's impact on the region would be minimal.

TABLE A-1

NOVATO CENTER TRAFFIC GENERATION 1/

		Evening Peak Hour		24 Hour Total	
		<u>Trip Rate 2/</u>	<u>Total 3/</u>	<u>Trip 2/</u>	<u>Total 3/</u>
Typical Friday	In	1.52	1,498	17.5	17,260
	Out	<u>1.58</u>	<u>1,559</u>	<u>17.5</u>	<u>17,260</u>
	Total	3.1	3,057	35	34,520

1/ Corresponds to fully operational and matured shopping center. This maximum level of trip generation was used for the impact analysis.

2/ Trip rate is expressed as the number of trips per 1,000 square feet of gross leasable floor area. This rate was determined from the Institute of Transportation Engineering Information Report Trip Generation, 1976, book by comparing regional shopping centers between 500,000 and 1,000,000 square feet in size. This rate was used in the City of Novato Regional Shopping Center Draft EIR, March 1979.

3/ Total trips are based on 986,300 square feet of gross leasable floor area.

NOVATO CENTER ALTERNATIVES #1, #2, AND #3

TABLE A-2

TRAFFIC VOLUMES IN PROJECT AREA

UTM Grid Square	Link Number	AVERAGE DAILY TRAFFIC VOLUME			Peak Hour Traffic	
		1978	1982 Without Project	1982 Project Only		1982 With Project
4214539	L-1	-	7775	0	7775	675
	L-2	66475	80800	20712	101512	9133
	L-3	-	-	2072	2072	184
	L-4	2750	2072	0	3050	250
4215538	L-5	7200	7950	0	7950	600
	L-6	9200	10150	690	10840	1011
	L-7	11925	13175	1726	14901	1252
	L-8	12475	13775	3106	16881	1550
	L-9	1550	1700	0	1700	200
	L-10	6900	7625	1380	9005	847
	L-11	5800	6400	0	6400	425
	L-12	1000	1100	3625	4725	390
	L-13	66475	80800	20712	101512	9133
	L-14	7080	7875	2481	10356	898
	L-15	-	-	10356	10356	935
L-21	-	-	16637	16637	1663	
4215539	L-22	66475	80800	20712	101512	9133
4216538	L-16	1225	1350	3625	4975	477
	L-17	57775	70225	7250	77475	6942
	L-18	6900	7625	1380	9005	847
	L-19	-	-	7825	7825	800
	L-20	-	-	8206	8206	741

Source: NOVATO REGIONAL SHOPPING CENTER DRAFT ENVIRONMENTAL IMPACT REPORT, March 1979 and U.S. Army Corps of Engineers.

NOVATO CENTER ALTERNATIVES #1, #2, AND #3

TABLE A-3

VEHICLE EMISSION FACTORS 1/

POLLUTANT	1982 GRAMS/MILE				
	10 MPH	20 MPH	30 MPH	40 MPH	50 MPH
CO	79.49	45.79	32.90	27.47	24.69
Hydrocarbons	7.69	4.21	2.72	2.11	1.73
NO	3.19	3.19	3.30	3.68	4.23
SO	.25	.25	.25	.25	.25
TSP	.45	.45	.45	.45	.45

1/ These emission factors were derived through interpolation of the 1975 Base and 1985 Projected emission factors contained in the Environmental Protection Agency's MOBILE 1 final document dated March 1978.

NOVATO CENTER ALTERNATIVES #1, #2, AND #3

TABLE A-4

BASIC DATA PERTAINING TO ROADWAYS IN THE PROJECT AREA

UTM GRID NO.	LINK NUMBER	ROADWAY	SEGMENT	LINK LENGTH (MILES)	AVERAGE LINK SPEED MPH
4214539	L-1	South Novato Blvd	Btwn UTM Gridsquare Bdrys	0.72	30
	L-2	U.S. 101	Btwn UTM Gridsquare Bdrys	0.40	50
	L-3	SR 37 Exit to Project Site	Gridsquare Bdry-Project Site	0.33	20
	L-4	Redwood Blvd	Albion Ct-S Novato Blvd	0.38	30
4215538	L-5	South Novato Blvd	Sunset Pkwy-Gridsquare Bdry	0.19	30
	L-6	South Novato Blvd	Rowland Blvd-Sunset Pkwy	0.22	30
	L-7	South Novato Blvd	Gridsquare Bdry-Rowland Blvd	0.34	30
	L-8	Rowland Blvd	S Novato Blvd-Redwood Blvd	0.22	30
	L-9	Redwood Blvd	Rowland Blvd-Oak Crest Ct	0.32	20
	L-10	Redwood Blvd	Gridsquare Bdry-Rowland Blvd	0.16	40
	L-11	S Bnd U.S. 101 On Ramp	Rowland Blvd-U.S. 101	0.28	30
	L-12	U.S. 101 Off Ramp	U.S. 101-Rowland Blvd	0.20	40
	L-13	U.S. 101	Gridsquare Bdry-Off Ramp For Rowland Blvd	0.24	50
	L-14	U.S. 101 Off Ramp	Btwn UTM Gridsquare Bdrys	0.20	50
	L-15	Loop-West of U.S. 101	Rowland Blvd-U.S. 101	0.15	30
	L-21	Rowland Blvd	U.S. 101 Off Ramp- Gridsquare Bdry	0.18	30

TABLE A-4
(Cont'd)

BASIC DATA PERTAINING TO ROADWAYS IN THE PROJECT AREA

UTM GRID NO.	LINK NUMBER	ROADWAY	SEGMENT	LINK LENGTH (MILES)	AVERAGE LINK SPEED MPH
4215539	L-22	U.S. 101	Btwn UTM Gridsquare Bdrys	0.56	50
4216538	L-16	North Bnd. U.S. 101 On Ramp	Rowland Blvd-U.S. 101	0.20	40
	L-17	U.S. 101	Btwn UTM Gridsquare Bdrys	0.64	50
	L-18	Redwood Blvd	Btwn UTM Gridsquare Bdrys	0.56	40
	L-19	Loop-East of U.S. 101	Rowland Blvd-U.S. 101	0.12	30
	L-20	City Street- Proposed	Rowland Blvd-Project Site	0.06	20

Source: U.S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVES #1, #2, AND #3

TABLE A-5

LINE SOURCE IMPACT
CONCENTRATION i/ AT ROADWAY: CARBON MONOXIDE

ROAD LINK	1978				1982				PROJECT ONLY IMPACT ON WITH PROJECT				TOTAL DAILY EMISSIONS GRAMS/DAY
	WITHOUT PROJECT		PROJECT ONLY		WITH PROJECT		EIGHT HOUR		ONE HOUR	EIGHT HOUR	EIGHT HOUR	EIGHT HOUR	
	ONE HOUR	EIGHT HOUR	ONE HOUR	EIGHT HOUR	ONE HOUR	EIGHT HOUR	ONE HOUR	EIGHT HOUR					
L-1	6,184	1,051	4,826	877	-	4,826	877	-	-	-	-	184,174	
L-2	61,483*	6,654	52,201*	6,275	13,107	65,308*	7,884	20	20	20	20	1,002,532	
L-3	-	-	-	-	1,315	1,315	325	100	100	100	100	31,309	
L-4	2,049	410	1,787	344	-	1,787	1,787	-	-	-	-	38,131	
L-5	5,635	1,073	4,290	897	-	4,290	897	-	-	-	-	49,695	
L-6	8,710	1,372	6,793	1,145	436	7,229	1,223	6	6	6	6	78,459	
L-7	10,247	1,778	7,865	1,487	1,087	8,952	1,682	12	12	12	12	166,682	
L-8	11,784	1,860	9,117	1,555	1,966	11,083	1,905	18	18	18	18	122,184	
L-9	1,536	330	1,430	267	-	1,430	267	-	-	-	-	24,909	
L-10	6,916	844	5,184	718	872	6,056	848	14	14	15	15	39,578	
L-11	3,842	865	3,038	722	-	3,038	722	-	-	-	-	58,956	
L-12	768	122	536	103	2,252	2,788	445	81	77	77	77	25,959	
L-13	61,483*	6,654	52,201*	6,275	13,107	65,308*	7,884	20	20	20	20	601,519	
L-14	7,685	772	5,720	667	701	6,421	877	11	11	24	24	71,593	
L-15	-	-	-	-	6,685	6,685	1,168	100	100	100	100	51,106	
L-16	1,280	149	1,072	127	2,338	3,410	468	69	73	73	73	27,332	
L-17	53,285*	5,783	45,050*	5,454	4,591	49,641*	6,017	9	9	9	9	1,224,228	
L-18	6,916	844	5,184	718	872	6,056	848	14	14	15	15	138,525	
L-19	-	-	-	-	5,720	5,720	883	100	100	100	100	30,893	
L-20	-	-	-	-	5,298	5,298	1,289	100	100	100	100	22,545	
L-21	-	-	-	-	11,891	11,891	1,878	100	100	100	100	98,524	
L-22	61,483*	6,654	52,201*	6,275	13,107	65,308*	7,884	20	20	20	20	1,403,545	

i/ Concentrations are expressed in micrograms/cubic meter (ug/m³).

* Highlights those road links that exceed the standard for carbon monoxide concentrations.

The standards for carbon monoxide concentrations are:

1-hour averaging time = 40,000 ug/m³

8-hour averaging time = 10,000 ug/m³

Source: U.S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVES #1, #2, AND #3

TABLE A-6

LINE SOURCE IMPACT CONCENTRATION I/ FOR 1-HOUR AVERAGING TIME SENSITIVE RECEPTORS: CARBON MONOXIDE

ROAD LINK	1978						1982					
	WITHOUT PROJECT			PROJECT ONLY			WITHOUT PROJECT			PROJECT ONLY		
	DISTANCE IN METERS			DISTANCE IN METERS			DISTANCE IN METERS			DISTANCE IN METERS		
	5	20	100	5	20	100	5	20	100	5	20	100
L-1	4,384	3,277	2,337	3,440	2,572	1,833	-	-	-	3,440	2,572	1,833
L-2	43,837*	32,770	23,363	37,219	27,823	19,836	9,345	6,986	4,981	45,564*	34,809	24,817
L-3	-	-	-	-	-	-	937	700	499	937	700	499
L-4	1,461	1,092	779	1,274	952	679	-	-	-	1,274	952	679
L-5	4,018	3,003	2,142	3,058	2,286	1,630	-	-	-	3,058	2,286	1,630
L-6	6,212	4,643	3,311	4,843	3,620	2,581	311	233	166	5,154	3,853	2,747
L-7	7,308	5,462	3,895	5,607	4,192	2,988	775	579	413	6,382	4,771	3,401
L-8	8,404	6,281	4,480	6,500	4,859	3,464	1,401	1,048	747	7,901	5,907	4,211
L-9	1,095	818	583	1,019	762	543	-	-	-	1,019	762	543
L-10	4,932	3,686	2,629	3,696	2,763	1,969	621	464	332	4,317	3,227	2,301
L-11	2,740	2,048	1,460	2,166	1,619	1,154	-	-	-	2,166	1,619	1,154
L-12	547	409	291	382	285	203	1,605	1,201	856	1,987	1,486	1,059
L-13	43,837*	32,770	23,363	37,219	27,823	19,836	9,345	6,986	4,981	46,564*	34,809	24,817
L-14	5,479	4,096	2,920	4,078	3,048	2,173	500	374	266	4,578	3,422	2,439
L-15	-	-	-	-	-	-	4,766	3,563	2,540	4,766	3,563	2,540
L-16	912	682	486	764	571	407	1,667	1,246	888	2,431	1,817	1,295
L-17	37,992	28,400	20,248	32,120	24,011	17,119	3,274	2,447	1,744	35,394	26,458	18,863
L-18	4,931	3,686	2,628	3,696	2,763	1,969	621	464	332	4,317	3,227	2,301
L-19	-	-	-	-	-	-	4,078	3,048	2,173	4,078	3,048	2,173
L-20	-	-	-	-	-	-	3,777	2,823	2,013	3,777	2,823	2,013
L-21	-	-	-	-	-	-	8,478	6,337	4,518	8,478	6,337	4,518
L-22	43,837*	32,770	23,363	37,219	27,823	19,836	9,345	6,986	4,981	46,564*	34,809	24,817

I/ Concentrations are expressed in micrograms/cubic meter (ug/m³).

* Highlights those road links that exceed the standard for carbon monoxide concentrations. The standard for 1-hour concentration = 40,000 ug/m³.

Source: U.S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVES #1, #2, AND #3

TABLE A-7

LINE SOURCE IMPACT CONCENTRATION 1/ FOR 8-HOUR AVERAGING TIME SENSITIVE RECEPTORS: CARBON MONOXIDE

ROAD LINK	1978						1982					
	WITHOUT PROJECT			PROJECT ONLY			WITHOUT PROJECT			PROJECT ONLY		
	DISTANCE IN METERS			DISTANCE IN METERS			DISTANCE IN METERS			DISTANCE IN METERS		
	5	20	100	5	20	100	5	20	100	5	20	100
L-1	702	496	332	586	414	277	-	-	-	586	414	277
L-2	4,451	3,147	2,102	4,197	2,968	1,982	1,077	761	509	5,274	3,729	2,491
L-3	-	-	-	-	-	-	217	153	102	217	153	102
L-4	274	193	129	230	162	108	-	-	-	230	162	108
L-5	717	507	339	600	424	283	-	-	-	600	424	283
L-6	917	648	433	766	541	361	52	37	25	818	578	386
L-7	1,189	840	562	994	703	469	131	92	62	1,125	795	531
L-8	1,243	879	588	1,040	735	491	234	166	111	1,274	901	602
L-9	220	156	104	178	126	84	-	-	-	178	126	84
L-10	564	399	266	480	339	226	87	62	41	567	401	267
L-11	578	409	273	483	341	228	-	-	-	483	341	228
L-12	81	57	38	68	48	32	229	162	108	297	210	140
L-13	4,451	3,147	2,102	4,197	2,968	1,982	1,077	761	509	5,274	3,729	2,491
L-14	516	365	243	446	315	210	140	99	67	586	414	277
L-15	-	-	-	-	-	-	781	552	369	781	552	369
L-16	99	70	47	84	60	40	229	161	107	313	221	147
L-17	3,868	2,735	1,827	3,648	2,579	1,723	377	267	178	4,025	2,846	1,901
L-18	564	399	266	480	339	226	87	62	41	567	401	267
L-19	-	-	-	-	-	-	590	417	279	590	417	279
L-20	-	-	-	-	-	-	862	609	407	862	609	407
L-21	-	-	-	-	-	-	1,256	888	593	1,256	888	593
L-22	4,451	3,147	2,102	4,197	2,968	1,982	1,077	761	509	5,274	3,729	2,491

1/ Concentrations are expressed in micrograms/cubic meter (ug/m³).

The standard for 8-hour concentration = 10,000 ug/m³.

Source: U.S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVES #1, #2, AND #3

TABLE A-8

AREA SOURCE AND REGIONAL AIR QUALITY IMPACTS FOR 1982

CONTAMINANT	AIR QUALITY STANDARD AVERAGING TIME	AIR QUALITY STANDARD (ug/m ³)	EMISSIONS Background Project Total	AREA SOURCE IMPACTS (ug/m ³)		REGIONAL IMPACT (ug/m ³)
				UTM GRID COORDINATES 4215539	4215538 4215539 4216538	
Carbon Monoxide	1-Hour	40,000	Background	8,251	2,265	8,930
			Project	4,921	3,894	2,052
			TOTAL	13,172	6,159	10,982
Hydrocarbons	8-Hour	10,000	Background	4,518	1,241	4,890
			Project	2,694	2,132	1,123
			TOTAL	7,212	3,373	6,013
Nitrogen Dioxide	3-Hour	160	Background	530*	182*	578*
			Project	280*	217*	117
			TOTAL	810*	399	695
Nitrogen Dioxide	1-Hour	470	Background	680*	778*	677*
			Project	188	196	116
			TOTAL	868*	974*	793*
Nitrogen Dioxide	1-Year	100	Background	140*	30	103*
			Project	23	30	18
			TOTAL	163*	60	121*

TABLE A-8
(Cont'd)

AREA SOURCE AND REGIONAL AIR QUALITY IMPACTS FOR 1982

CONTAMINANT	AIR QUALITY STANDARD AVERAGING TIME	AIR QUALITY STANDARD (ug/m ³)	EMISSIONS Background Project Total	AREA SOURCE IMPACTS (ug/m ³)		REGIONAL IMPACT (ug/m ³)
				UTM GRID COORDINATES 4214539 4215538	UTM GRID COORDINATES 4215539 4216538	
Sulfur Dioxide	1-Hour	1,310	Background	120	88	89
			Project	36	44	22
			TOTAL	156	132	111
	24-Hour	105	Background	48	36	36
			Project	14	18	9
			TOTAL	62	54	45
	1-Year	80	Background	11	8	8
			Project	3	4	2
			TOTAL	14	12	10
Suspended Particulate	24-Hour	100	Background	62	47	47
			Project	17	21	11
			TOTAL	79	68	58
	1-Year	60	Background	17	13	13
			Project	5	6	3
			TOTAL	22	19	16

1/ Refer to Plate A-1 for locations.

Area Source and regional air quality impacts are indicated in this Table as the maximum concentration of air quality standard related contaminants expected to occur during a single year as the result of project related emissions. Impact calculations are based on simplified manual dispersion calculations and statistical techniques with conservative input values.

* Indicate that concentrations are expected to exceed the standards.

Source: U.S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVE #5 - H.A.F.B.

TABLE A-9

TRAFFIC VOLUMES IN PROJECT AREA

JTM Grid Square	Link Number	AVERAGE DAILY TRAFFIC VOLUME					Peak Hour Traffic
		1978	1985 Without Project	1985 Project Only	1985 With Project	1985	
4212541	L-1	85000	114000	0	114000	12500	
	L-2	6200	7400	20712	28112	3092*	
	L-3	2450	2900	34520	37420	4116*	
	L-4	6200	7400	13808	21208	2333*	
4211541	L-5	85000	114000	0	114000	12500	
	L-6	7000	9400	13808	23208	2553*	

*Peak hour traffic was estimated to be 11% of ADT as determined for similar traffic levels in Figure VI-18 of Draft Environmental Impact Statement on Disposition and Use of Federal Surplus Property At Hamilton Air Force Base, Novato, California (DEIS DUFSS PHAFB) dated April 1979.

NOTE: The shopping center traffic is estimated at 34,520 based on the Novato Regional Shopping Center (NRSC) EIR, March 1979. Distribution of shopping center traffic is based on p. VI-64 of the DEIS DUFSS PHAFB with the following modifications; The State Access Rd. was considered the only access to the shopping center site, L-2 accounts for 60% of the shopping center traffic (57% for U.S. 101 heading south, 2.6% for Ignacio, & .6% for Bel Marin Keys Blvd.). L-4 and L-6 accounts for 40% of the shopping center traffic (39% for U.S. 101 heading north, and .8% for H.A.F.B. existing).

SOURCE: Draft Environmental Impact Statement on Disposition and Use of Federal Surplus Property At Hamilton Air Force Base, Novato, California, April 1979; and U.S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVE #5 - H.A.F.B.

TABLE A-10

BASIC DATA PERTAINING TO ROADWAYS IN THE PROJECT AREA

UTM Grid Square	Link Number	Roadway	Segment	Link Length (miles)	Average Link Speed* (mph)
4212541	L-1	U.S. 101	Boundary to Boundary	0.40	50
	L-2	Nave Drive	Boundary to State Access Rd.	0.24	20
	L-3	State Access Rd.	Nave Dr. to Project Site	0.20	20
	L-4	Nave Drive	State Access Rd. to Bdry.	0.20	20
4211541	L-5	U.S. 101	Boundary to Boundary	0.60	50
	L-6	Nave Drive	Boundary to Boundary	0.64	20

Source: U.S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVE # 5 - H.A.F.B.

TABLE A-11

LINE SOURCE IMPACT
CONCENTRATIONS 1/ AT ROADWAY: CARBON MONOXIDE

Road Link	1978		1985				PROJECT ONLY IMPACT ON		TOTAL DAILY EMISSIONS Grams/Day	
	1-Hour	8-Hour	WITHOUT PROJECT 1-Hour	PROJECT ONLY 1-Hour	8-Hour	WITH PROJECT 1-Hour	8-Hour	WITH PROJECT % 1-Hour		8-Hour
L-1	96325*	8508	60351*	6936	-	60531*	6936	-	-	881904
L-2	8197	1324	4007	850	10921	14928	3227	73	74	225683
L-3	3996	523	2221	333	17651	19872	4295	89	92	250339
L-4	8197	1324	4007	849	7256	11263	2434	64	65	141881
L-5	96325*	8508	60351*	6936	-	60351*	6936	-	-	1322856
L-6	7070	1495	4442	1079	7884	12326	2663	64	59	496836

1/ Concentrations are expressed in micrograms/cubic meter (ug/m³).

* Highlights those road links that exceed the standard for carbon monoxide concentrations.

The standards for carbon monoxide concentrations are:

1-Hour averaging time = 40,000 ug/m³

8-Hour averaging time = 10,000 ug/m³

Source: U. S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVE #5 - H.A.F.B.

TABLE A-12

CONCENTRATION 1/ FOR 1-HOUR AVERAGING TIME
SENSITIVE RECEPTORS: CARBON MONOXIDE

Road Link	1978						1985					
	Without Project			With Project			Without Project			With Project		
	Distance In Meters	5	20	100	5	20	100	5	20	100	5	20
L-1	68680*	51341*	36603	43030*	32167	22923	-	-	-	43030*	32167	22933
L-2	5844	4369	3114	2857	2136	1523	7786	5820	4149	10643	7956	5672
L-3	2849	2129	1518	1583	1184	844	12585	9407	6707	14168	10591	7551
L-4	5844	4369	3114	2857	2141	1522	5173	3862	2757	8030	6003	4279
L-5	68680*	51341*	36603	43030*	32167	22933	-	-	-	43030*	32167	22933
L-6	5040	3768	2686	3167	2367	1688	5621	4202	2995	8788	6569	4683

1/ Concentrations are expressed in micrograms/cubic meter (ug/m³).

* Highlights those road links that exceed the standard for carbon monoxide concentrations. The standard for 1-hour concentration = 40,000 ug/m³.

Source: U.S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVE #5 - H.A.F.B.

TABLE A-3

CONCENTRATION 1/ FOR 8-HOUR AVERAGING TIME
SENSITIVE RECEPTORS: CARBON MONOXIDE

Road Link	1978						1985						
	Without Project			With Project			Project Only			With Project			
	Distance In Meters	5	20	100	20	100	Distance In Meters	5	20	100	Distance In Meters	5	20
L-1	5692	4024	2688	4640	3280	2191	-	-	-	-	4640	3280	2191
L-2	885	626	418	568	402	268	1590	1124	751	2158	1526	1019	
L-3	349	247	165	223	157	106	2650	1874	1251	2873	2031	1357	
L-4	885	626	418	568	402	269	1060	749	500	1628	1151	769	
L-5	5692	4024	2688	4640	3280	2191	-	-	-	4640	3280	2191	
L-6	1000	707	472	721	510	341	1060	749	500	1781	1259	841	

1/ Concentrations are expressed in micrograms/cubic meter (ug/m³).
The standard for 8-hour concentration = 10,000 ug/m³.

Source: U.S. Army Corps of Engineers

NOVATO CENTER ALTERNATIVE #5 - H. A. F. B.

TABLE A-14

AREA SOURCE AND REGIONAL AIR QUALITY IMPACTS FOR 1985

Contaminant	Air Quality Standard Averaging Time	Air Quality Standard (ug/m ³)	Emissions		Area Source Impacts (ug/m ³) UTM Grid Coordinates 1/ 4212541	Regional Impact (ug/m ³)
			Background Project Total	4211541		
Carbon Monoxide	1-Hour	40000	Background	277	4744	0.7879
			Project	8824	3033	
			TOTAL	9101	7777	
Hydrocarbons	8-Hour	10000	Background	152	2598	0.5515
			Project	4832	1661	
			TOTAL	4984	4259	
Nitrogen Dioxide	3-Hour	160	Background	35	291*	0.0531
			Project	540*	186*	
			TOTAL	575*	477*	
	1-Hour	470	Background	28	471*	0.0286
			Project	164	90	
			TOTAL	192	561*	
	1-Year	100	Background	4	72	-
			Project	25	14	
			TOTAL	29	81	

TABLE A-i4
(Cont'd)

AREA SOURCE AND REGIONAL AIR QUALITY IMPACTS FOR 1985

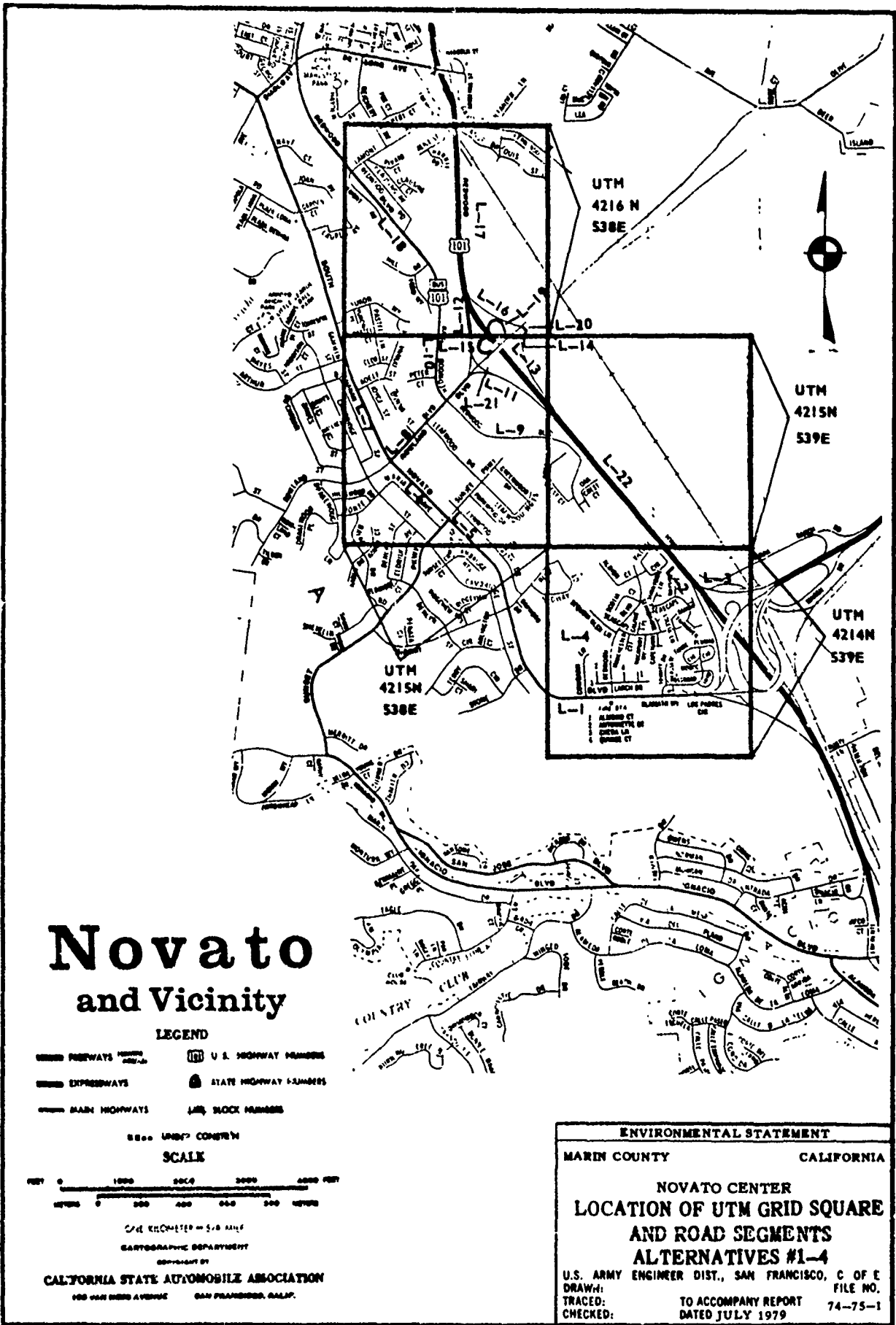
Contaminant	Air Quality Standard Averaging Time	Air Quality Standard (ug/m ³)	Emissions		Area Source Impacts (ug/m ³)		Regional Impact (ug/m ³)
			Background	Project	UTM Grid Coordinates 1/	4211541	
Sulfur Dioxide	1-Hour	1310	Background	4	81	4212541	0.0076
			Project	87	28		
				TOTAL	91	109	
	24-Hour	105	Background	2	32	4211541	0.0045
			Project	35	11		
				TOTAL	37	43	
1-Year	80	Background	1	7	4211541	-	
		Project	8	3			
			TOTAL	9	10		
Suspended Particulate	24-Hour	100	Background	3	34	4211541	0.0054
			Project	33	11		
				TOTAL	36	45	
	1-Year	60	Background	1	9	4211541	-
			Project	9	3		
				TOTAL	10	12	

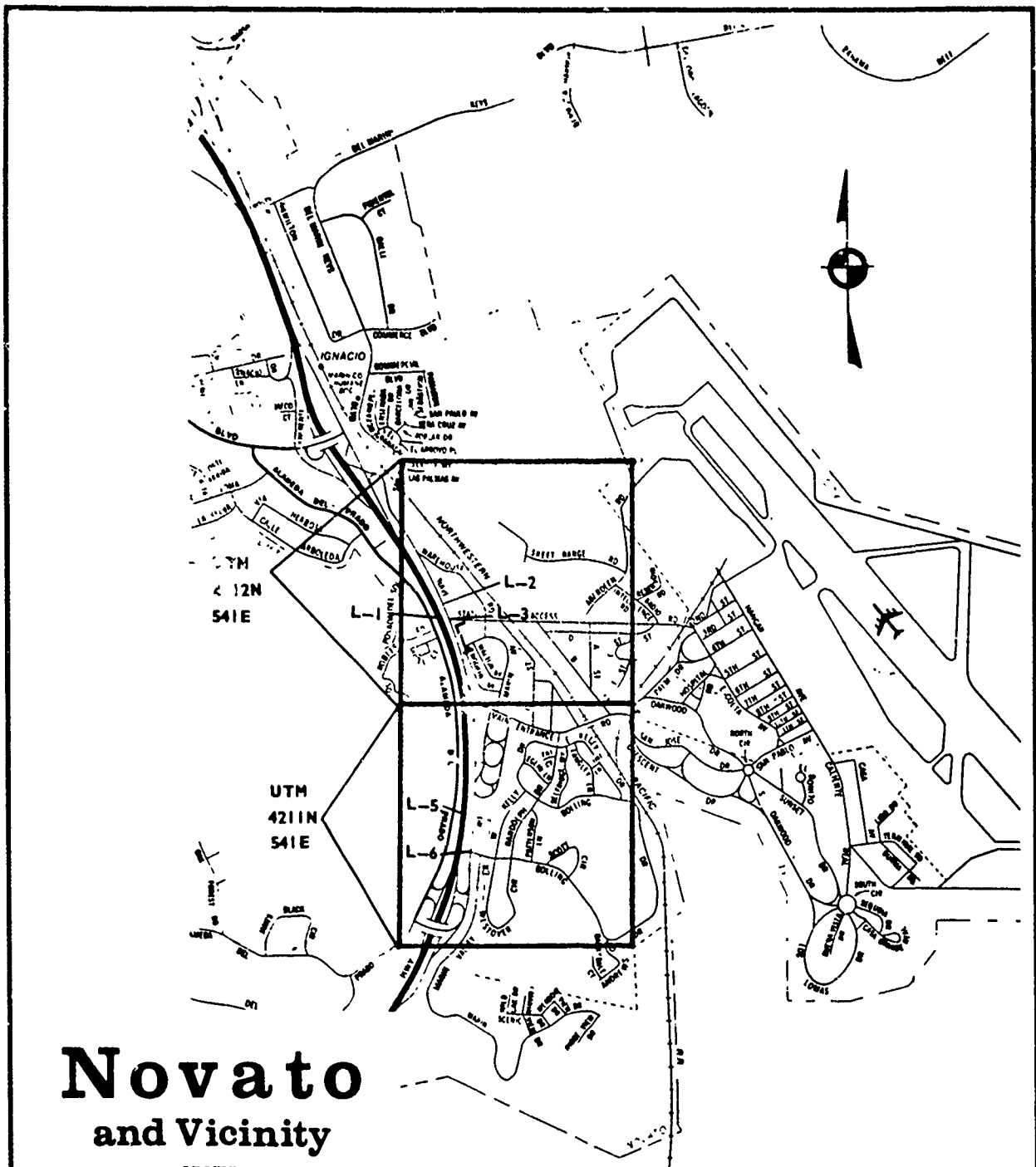
1/ Refer to Plate A-1 for locations.

* Indicates that concentrations are expected to exceed the standards.

Note: Area source and regional air quality impacts are indicated in this Table as the maximum concentration of air quality standard related contaminants expected to occur during a single year as a result of project related emissions. Impact calculations are based on simplified manual dispersion calculations and statistical techniques with conservative input values.

Source: U. S. Army of Corps of Engineers



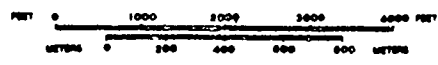


Novato and Vicinity

LEGEND

- FREEWAYS (with shield symbol)
- EXPRESSWAYS
- MAIN HIGHWAYS
- UNDER CONSTR'N
- U.S. HIGHWAY NUMBERS
- STATE HIGHWAY NUMBERS
- BLOCK NUMBERS

SCALE



ONE KILOMETER = 5/8 MILE

CARTOGRAPHIC DEPARTMENT

CONTRIBUTED BY

CALIFORNIA STATE AUTOMOBILE ASSOCIATION
100 VAN NESS AVENUE SAN FRANCISCO CALIF.

ENVIRONMENTAL STATEMENT	
MARIN COUNTY	CALIFORNIA
NOVATO CENTER LOCATION OF UTM GRID SQUARE AND ROAD SEGMENTS ALTERNATIVES #5	
U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E DRAWN: TRACED: CHECKED:	TO ACCOMPANY REPORT DATED JULY 1979
	FILE NO. 74-75-1

C

APPENDIX B
MISCELLANEOUS DOCUMENTS

APPENDIX B
MISCELLANEOUS DOCUMENTS

DOCUMENT		PAGE
B-1	Permit Application #10138-33 by Novato Center Inc.	B-1
B-2	Public Notice #10138-33 Novato Center Inc.	B-4
B-3	Title Agreement between Novato Center Inc. and the State of California	B-8
B-4	Resources Agency of California response to Public Notice #10138-33, 23 August 1979	B-11

Murray-McCormick

a Genge Consultant

Engineering · Surveying · Planning

150 Ford Way, Novato,
CA 94947 • (415) 897-7175

Houston Atlanta Oakland
Albuquerque Sacramento

October 6, 1977
File: 759-011

Department of the Army
Corps of Engineers
211 Main Street
San Francisco, Ca 94105

Attn: Permit Processing

Subject: Fill Permit, Hanna Ranch, Novato
(Ref. No. 10138-33)

Gentlemen:

Submitted herewith for permit processing is an application, drawings and prints of the proposed grading plan as supplemental reference.

Yours very truly,

MURRAY-McCORMICK, INC.

Keith Hastings

Keith Hastings

KH/mr

Enclosures

DOCUMENT B-1

APPLICATION FOR A DEPARTMENT OF THE ARMY PERMIT

One set of original drawings and two copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and checklist).

1. Application number (To be assigned by Corps). <p align="center">10138-33</p>	2. Date. <p align="center">5 Oct. 1977 Day Mo. Yr.</p>	3. For official use only. DATE RECEIVED: <i>file</i> 7 OCT 77 <i>6 12 1977</i>
--	---	--

4. Name and address of applicant.

Owner: Novato Center, Inc.
1290 Howard Avenue
Burlingame, Calif.

Telephone number (415) 347-8535 Social Security No. _____

5. Name, address, and title of applicant's authorized agent for permit application coordination.

Engineer: Murray-McCormick, Inc.
150 Ford Way
Novato, Calif.
Keith Hastings, Proj. Engr.

Telephone Number (415) 897-7175

6. Describe the proposed activity, its purpose and intended use, including a description of the type of structures, if any, to be erected on fills, or pile or float supported platforms, and the type, composition and quantity of materials to be discharged or dumped and means of conveyance.

Fill reclaimed lowlands to
predevelopment levels. Top
of fill varies 4 to 6 ft. (M.S.L.)
Portion of proposed commercial retail development
Fill quantity is 395,575 C.Y. from proposed lake site
northeast of fill site.

7. Proposed use.

Private Public Commercial Other (Explain in remarks)

8. Name and addresses of adjoining property owners whose property also adjoins the waterway.

State of California, Sacramento, Calif.
Northwestern Pacific Railroad, P.O. Box 629, Willits, Ca 95490
McPhails Fuel Co., P. O. Box 1290 San Rafael, Ca 94902

9. Location where proposed activity exists or will occur.

Sec. _____ Twp _____ Rge _____ (Where applicable)

Calif. Marin Novato
State County In - City or Town Near - City or Town

10 Name of waterway at location of the activity. Lynwood Slough near Novato Creek

11. Date activity is proposed to commence. upon approval of all permits
 Date activity is expected to be completed. 6 mo. after start - depending on season

12. Is any portion of the activity for which authorization is sought now complete? Yes No
 If answer is "Yes" give reasons in the remarks section. Month and year the activity was completed _____ . Indicate the existing work on the drawings.

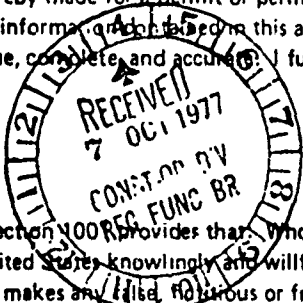
13. List all approvals or certifications required by other Federal, interstate, state or local agencies for any structures, construction, discharges, deposits or other activities described in this application.

Issuing Agency	Type Approval	Identification No.	Date of Application	Date of Approval
State Fish & Game	Fill permit		9-26-77	
U.S. Fish & Wildlife	Approval to Corps		9-26-77	
City of Novato	Fill & Use Permit		10-5-77	
City of Novato	Project E.I.R.		9-73	12-13-74

14. Has any agency denied approval for the activity described herein or for any activity directly related to the activity described herein? Yes No (If "Yes" explain in remarks)

15. Remarks (see paragraph 3 of Permits Pamphlet for additional information required for certain activities).

16. Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information furnished in this application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.



Robert M. Hastings
 Signature of Applicant

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both.

The application must be signed by the person who desires to undertake the proposed activity; however, the application may be signed by a duly authorized agent if accompanied by a statement by that person designating the agent and agreeing to furnish upon request, supplemental information in support of the application.

If the activity includes the discharge of dredged or fill material in navigable waters or the transportation of dredged material for the purpose of dumping it in ocean water, this application must be accompanied by a fee of \$100 for quantities exceeding 2500 cubic yards and \$10 for quantities of 1000 to 2500 cubic yards or less. Federal, State and local governments are excluded from this requirement.



71
- keep -

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
211 MAIN STREET
SAN FRANCISCO, CALIFORNIA 94105

SPNCO-RN

27 January 1978

PUBLIC NOTICE NO. 10138-33

RESPONSE REQUIRED BY 26 February 1978

TO WHOM IT MAY CONCERN:

1. Novato Center Inc., Richard Hanna, President, 1290 Howard Avenue, Burlingame, California 94010, through its agent Murray-McCormick Inc., 150 Ford Way, Novato, California 94947 (telephone 415-897-7175), has applied for a Department of the Army permit to fill about 56 acres of lowland and slough, including the retention of partial fill placed on about 12 acres, for future land development, to excavate for fill material and create a lake of about 37 acres, and to retain landfill placed on about 53 acres of lowland at Lynwood Slough, Novato Creek, south of the city of Novato, Marin County, California. The vicinity map, plan and section of the proposed activity are shown on the inclosed drawing. This application has been submitted pursuant to the provisions of Section 10 of the River and Harbor Act of 1899 (33 U.S.C. 433; 30 Stat. 1151) and Section 404 of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500, 33 U.S.C. 1344; 86 Stat. 816).

2. The applicant states that the purpose of the proposed activity is to fill low-lying slough areas of his property to make it suitable for commercial and/or industrial site developments in the future. The property is bounded by Highway 101 on the west, Novato Creek on the north, the Northwestern Pacific Railroad on the east and Highway 37 on the south. The proposed excavation and lake would be on State Lands to the east. In accordance with terms of the legal agreement between Novato Center and the State of California, Novato Center obtained easement rights from the State to cover the proposed excavation. These activities take place on reclaimed tidelands under the Corps jurisdiction and have been used as agricultural land until recently. The city of Novato has zoned the northern portion of the Hanna property as commercial, and the southern portion as light industrial. The applicant has not yet finalized development plans for his property and may request a zone change from the city of Novato.

3. The proposed fill of approximately 395,575 cubic yards would be placed on about 56 acres of the property and is indicated by shading on the drawing; it includes about 12 acres of agricultural land on which some fill has been placed and about 8 acres of a seasonal brackish marsh (the modified slough). The applicant proposes the lake as compensation for the habitat loss in the slough. The 37 acres of completed fill are north of Lynwood Slough and shown "Area Filled" on the drawing.

SPNCO-RN
PUBLIC NOTICE NO. 10138-33

According to the applicant, the filling had started about July 1972 in connection with State construction work on Highway 101. It has been determined that no legal action would be taken at this time with regard to the completed fill and an after-the-fact application would be processed. Final drainage plans for Lynwood Slough would be made in conjunction with the final development plan of the applicant, either covered or open drain would be used, all as approved by the Marin County Flood Control and Water Conservation District. The proposed excavation of the 37-acre lake would yield about 500,000 cubic yards of fill material which would be placed and compacted for the required landfill. Depth of the lake would be about 12 feet below existing ground.

4. The applicant has applied to the California Department of Fish and Game and to the city of Novato for authorizations as required and was advised to inquire as to the need for certification from the California Regional Water Quality Control Board, San Francisco Bay Region.

5. In accordance with the requirements of the National Environmental Policy Act of 1969 (Public Law 91-190), the Corps of Engineers has made a preliminary assessment of the environmental, engineering, economic, and social aspects of the proposed activity, and determined that an Environmental Impact Statement (EIS) will be necessary. These aspects will be discussed in detail in the EIS. Requests for copies of the draft EIS should be submitted in writing and directed to the attention of the Environmental Branch of this office, at the address given above. The activity does not involve property listed in the National Register of Historic Places, or Registry of National Landmarks.

6. A permit issued by the Department of the Army does not give any property rights either in real estate or materials, or any exclusive privileges; and does not authorize any injury to private property or invasion of private rights, or any infringement of Federal, State, or local laws or regulations, nor does it eliminate the necessity of obtaining State assent to work authorized. The decision by the Corps of Engineers whether to issue a permit will be based on an evaluation of the probable impact of the activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered; among those are conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

S°MCP-RN

PUBLIC NOTICE NO. 10138-33

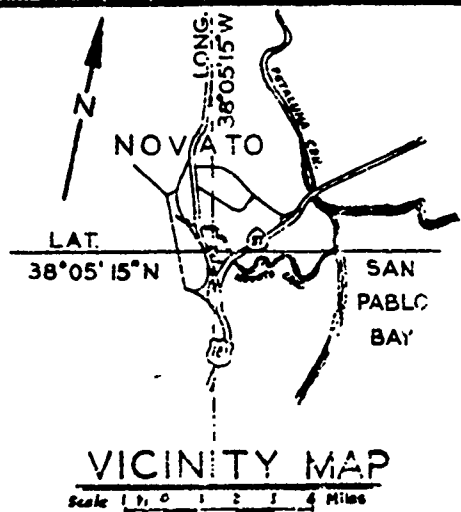
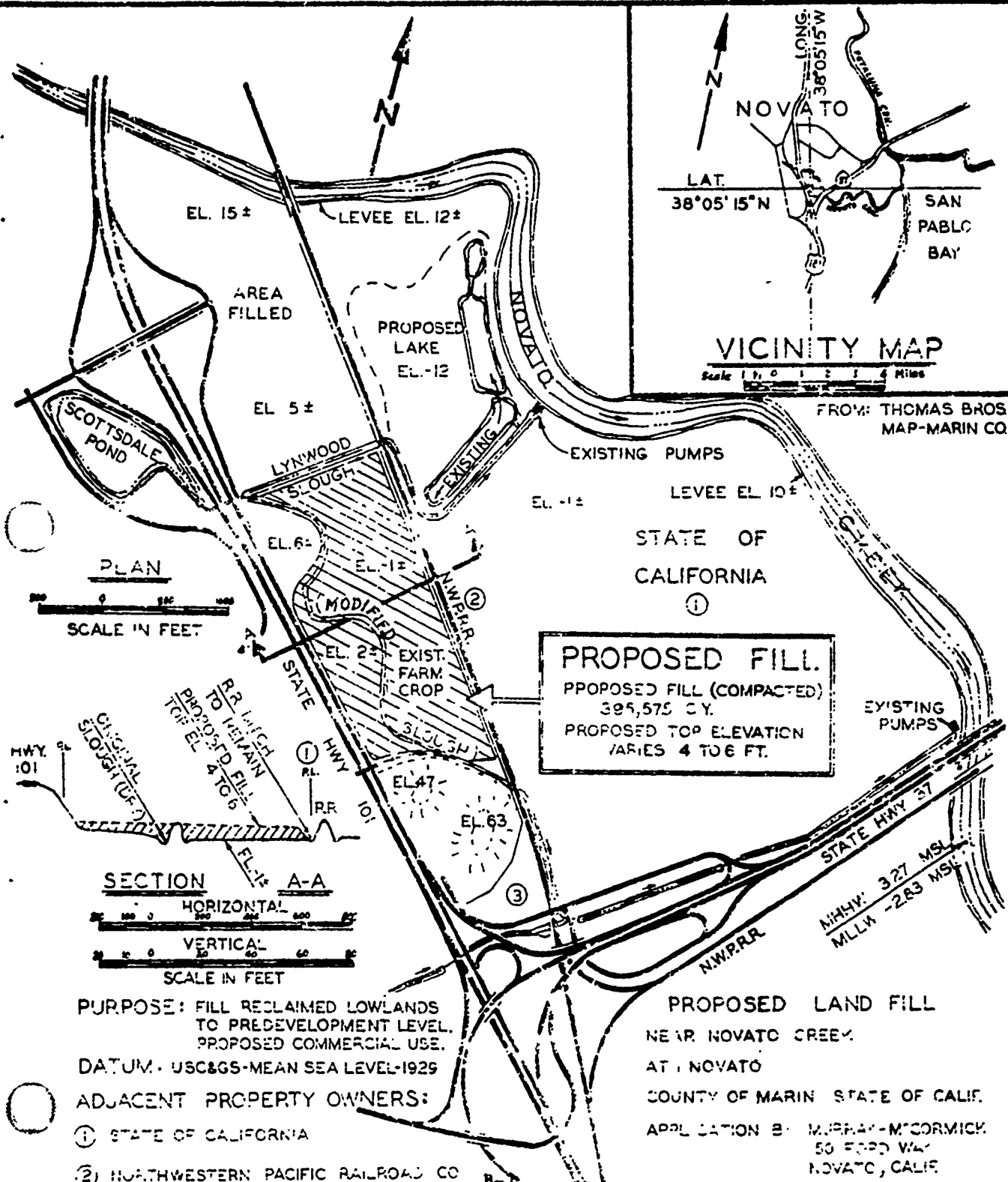
7. Evaluation of this activity's impact on the public interest will also include application of the guidelines promulgated by the Administrator of the Environmental Protection Agency under Section 404(b) of the Federal Water Pollution Control Act of 1972, 33 U.S.C. Section 1344(b), and (if applicable) Section 102(a) of the Marine Protection, Research, and Sanctuaries Act of 1972, 33 U.S.C. Section 1412(a). Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reason for holding a public hearing.

8. Interested parties may submit in writing any comments that they may have on this activity. Comments should include the number and date of this notice and should be forwarded so as to reach this office within the commenting period. It is the Corps policy to forward any such comments which include objections to the applicant for resolution or rebuttal. Details on any changes of a minor nature which are made in the final permit action will be provided on request.

JOHN M. ADSIT
Colonel, CE
District Engineer

B-6

0



PURPOSE: FILL RECLAIMED LOWLANDS TO PREDEVELOPMENT LEVEL. PROPOSED COMMERCIAL USE.

DATUM: USC&GS-MEAN SEA LEVEL-1929

ADJACENT PROPERTY OWNERS:

- ① STATE OF CALIFORNIA
- ② NORTHWESTERN PACIFIC RAILROAD CO
- ③ MCFARL FUEL CO.

FROM: THOMAS BROS MAP-MARIN CO

STATE OF CALIFORNIA
①

9293

145

RECORDED AT REQUEST OF
FIRST AMERICAN TITLE CO
AT 40 MIN. PAST 9 H. M.

9293

FEB 2 8 1977

Official Records of Marin County, Calif.

N. J. Liscimini

FILE \$ NO FEE RECORDER
C. 6103

Recorded at request of and
when recorded mail to:
State Lands Division
1807 13th Street
Sacramento, California 95814

Attention: Mr. James Trout

(State of California Official Business)
(Document entitled to free recordation
pursuant to Government Code Section 6103)

Instructions to the County Recorder of the County of Marin:

This document operates as both a State Patent of
certain real property to a private party and as a Partner-
ship Deed of certain other real property to the State of
California. Therefore, please index this document as follows:

<u>Grantor</u>	<u>Grantee</u>	<u>Property</u>
Novato Center, a limited partnership	State of California	Property described in Exhibit B hereto
State of California	Novato Center, a limited partnership	Property described in Exhibit C hereto

SETTLEMENT AND LAND EXCHANGE AGREEMENT,
STATE PATENT AND PARTNERSHIP DEED
REGARDING LANDS IN THE CITY OF NOVATO,
MARIN COUNTY, CALIFORNIA
BLA NO. 150
AND
PATENT CERTIFICATE NO. 5252

THIS SETTLEMENT AND LAND EXCHANGE AGREEMENT, STATE
PATENT AND PARTNERSHIP DEED (hereinafter collectively referred
to as the "Settlement Agreement") made and entered into as
of the 28th day of April, 1976, by and between DOCUMENT B-8

Parcel.

The State, pursuant to the provisions of Section 6307 of the Public Resources Code, hereby finds, determines and certifies that the Novato Center Parcel:

(a) Has been cut off from navigable waters, improved, filled, and reclaimed by Novato Center and its predecessors in interest;

(b) Has thereby been severed from the public channels and waterways and is no longer available or useful or susceptible of being used for commerce, navigation and fishing, and is no longer in fact tidelands or submerged lands and therefore is freed from such public trust.

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 Severability.

The State and Novato Center agree that upon the execution of this Settlement Agreement by the parties hereto and the recordation thereof in the Official Records of Marin County, each provision of this Settlement Agreement is intended to be severable and shall continue in full force and effect although other provisions hereto may be determined invalid or void for any reason.

7.2 Gender.

As used herein, whenever the context so requires, the neuter gender includes the masculine and the feminine, and the singular includes the plural and vice versa. Defined terms are to have their defined meaning regardless of the grammatical form, number or tense of such terms.

Code authorizing issuance
of a State Patent and
Section 6107 of the Public
Resources Code of the State
of California. Given under
my hand at the City of
Sacramento, this, the 11th
day of August, in the
year of our Lord one
thousand nine hundred and
seventy-six.

Wesley C. Dymally
ing, Governor of California



Attest:

Secretary of State

By William R. Washburn
Deputy Secretary of State

Countersigned:

Wm. J. Cantelero

Approved:

EVELLE J. YOUNGER,
Attorney General

By N. Gregory Taylor
N. GREGORY TAYLOR
~~Deputy~~ Attorney General
Assistant

NOVATO CENTER, a Limited Partnership

By Novato Center, Inc., General
Partner

By Richard E. Virina
President

OFFICE OF THE SECRETARY
RESOURCES BUILDING
1416 NINTH STREET
95814

(916) 445-5656

Department of Conservation
Department of Fish and Game
Department of Forestry
Department of Navigation and
Ocean Development
Department of Parks and Recreation
Department of Water Resources

EDMUND G. BROWN JR.
GOVERNOR OF
CALIFORNIA



Air Resources Board
California Coastal Commis.
California Conservation Co.
Colorado River Board
Energy Resources Conserv.
Development Commis.
Regional Water Quality Co.
San Francisco Bay Conserv.
Development Comm.
Solid Waste Management
State Coastal Conservancy
State Lands Commission
State Reclamation Board
State Water Resources Co.

THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA

Colonel John M. Adsit
District Engineer
San Francisco District
U. S. Army Corps of Engineers
211 Main Street
San Francisco, CA 94105

AUG 23 1978

State Review and Comment
Public Notice No. 10138-33 (Richard Hanna)
Proposal to place fill on wetlands at Lynwood Slough,
Novato Creek, Marin County

Dear Colonel Adsit:

In a letter dated March 1, 1978, the State requested that the Corps withhold issuance of the requested permit. Subsequently, additional information has been received. A negotiated written agreement was reached between the applicant and the State, prior to development of the State's Wetlands Policy, and as a result the State does not object to your issuance of the subject permit.

Sincerely,

A handwritten signature in dark ink, appearing to read "L. Frank Goodson".

L. FRANK GOODSON
Assistant Secretary for Resources

cc: Department of Navigation and
Ocean Development
Department of Parks and Recreation
State Water Resources Control Board
Department of Fish and Game
Wildlife Conservation Board
Department of Water Resources
Department of Health
Department of Conservation

Division of Highways
San Francisco Bay Conserv.
vation and Develop..
Commission
State Lands Division
Bureau of Sport Fish.
and Wildlife
Mr. Gerald V. Howard
Applicant - Richard

APPENDIX C
LIST OF SPECIES OBSERVED AT
STUDY AREAS #1-4
PREPARED BY
HARVEY & STANLEY ASSOCIATES, INC.
DECEMBER 1976

LIST OF VASCULAR PLANTS OBSERVED

ANACARDIACEAE Sumac Family

Rhus diversiloba T. & G. Poison-Oak.

CAPRIFOLIACEAE Honeysuckle Family

Symphoricarpos mollis Nutt. Snow-Berry.

CARYOPHYLLACEAE Pink Family

Spergularia marina (L.) Griseb. Marine Sand-Spurrey.

CHENOPODIACEAE Goosefoot Family

Atriplex patula L. ssp. hastata (L.) Hall & Clem. Hastate Saltbush.

A. semibaccata R. Br. Australian Saltbush.

Chenopodium album L. Pigweed.

Salicornia pacifica Standl. Pickleweed.

COMPOSITAE Sunflower Family

Agoseris apargioides (Less.) Greene.

Anaphalis margaritacea (L.) Benth. Pearly Everlasting.

Baccharis pilularis DC. ssp. consanguinea (DC.) C. B. Wolf. Coyote Brush.

Centaurea solstitialis L. Yellow Star-Thistle.

Cirsium arvense (L.) Scop. Canada Thistle.

Conyza canadensis (L.) Cronq. Horseweed.

Cotula coronopifolia L. Brass Buttons.

Gnaphalium luteo-album L. Cudweed.

Hemizonia luzulaefolia DC. ssp. rudis (Benth.) Keck. Hayfield Tarweed.

Heterotheca grandiflora Nutt. Large-flowered Telegraph Weed.

Hypochaeris radicata L. Bristly Cat's-Ear.

Lactuca serriola L. Prickly Lettuce.

Phacelia echioides L. Bristly Ox-Tongue.

Silybum marianum (L.) Gaertn. Milk Thistle.

Solidago canadensis L. ssp. elongata (Nutt.) Keck. Goldenrod.

Sonchus oleraceus L. Sow-Thistle.

Tragopogon porrifolius L. Salsify.

Xanthium strumarium L. var. canadense (Mill.) T. & G. Cockleburr.

CRUCIFERAE Mustard Family

Brassica geniculata (Desf.) J. Ball. Genuiculate Mustard.

Raphanus sativus L. Wild Radish.

Cyperus eragrostis Lam.
Heleocharis sp. Spike-Rush.
Scirpus robustus Pursh. Robust Tule.

DIPSACACEAE Teasel Family

Dipsacus fullonum L. Fuller's Teasel.

ERICACEAE Heath Family

Arbutus menziesii Pursh. Madrone.

EUPHORBIACEAE Spurge Family

Eremocarpus setigerus (Hook.) Benth. Turkey-Mullein.

FAGACEAE Beech Family

Quercus agrifolia Nee. Coast Live Oak.
Q. douglasii H. & A. Blue Oak.
Q. lobata Nee. Valley Oak.

GRAMINEAE Grass Family

Aira caryophyllea L.
Agrostis avenacea Gmel.
Avena barbata Brot. Slender Wild Oat.
Briza maxima L. Large Rattlesnake Grass.
B. minor L. Small Rattlesnake Grass.
Cortaderia selloana (Schult.) Asch. & Graebn. Pampas Grass.
Cynodon dactylon (L.) Pers. Bermuda Grass.
Danthonia californica Bol.
Deschampsia danthonioides (Trin.) Munro.
Distichlis spicata (L.) Greene var. stolonifera Beetle. Salt Grass.
Elymus triticoides Buckl.
Festuca sp.
Gastridium sp.
Heleochoa schoenoides (L.) Host.
Lolium multiflorum Lam. Italian Ryegrass.
L. perenne L. Perennial Ryegrass.
Phalaris tuberosa L. var. stenoptera (Hack.) Hitchc. Harding Grass.
Polypogon maritimus Willd.
P. monspeliensis (L.) Desf. Rabbit's-Foot Grass.

JUNCACEAE Rush Family

Juncus bufonius L. Toad Rush.
J. effusus L. var. brunneus Engelm.

LEGUMINOSAE Pea Family

Acacia decurrens Willd. Green Wattle.
Cytisus monspessulanus L. French Broom.
Lotus corniculatus L.
Lupinus sp.
Melilotus albus Desr. White Sweet-Clover.

LYTHRACEAE Loosestrife Family

Lythrum hyssopifolia L.

MYRTACEAE Myrtle Family

Eucalyptus globulus Labill. Blue Gum.

ONAGRACEAE Evening-Primrose Family

Epilobium paniculatum Nutt. Paniculate Willow-Herb.

PLANTAGINACEAE Plantain Family

Plantago lanceolata L. English Plantain.
P. maritima L. ssp. juncoides (Lam.) Hult.

POLYGONACEAE Buckwheat Family

Polygonum lapathifolium L. Willow Weed.
Rumex acetosella L. Sheep Sorrel
R. crispus L. Curly Dock.

ROSACEAE Rose Family

Heteromeles arbutifolia M. Roem. Toyon.
Rosa californica Cham. & Schlect. California Rose.
Rubus laciniatus Willd. Cut-Leaf Blackberry.

SALICACEAE Willow Family

Salix lasiolepis Benth. Arroyo Willow.

SOLANACEAE Nightshade Family

Solanum nodiflorum Jacq.

TYPHACEAE Cat-Tail Family

Typha latifolia L. Soft-Flag.

UMBELLIFERAE Carrot Family

MAMMALS OF NOVATO REGIONAL
SHOPPING CENTER STUDY AREA

(o=species observed
os=signs observed
po=predicted to occur
p=possible present, not probable)

Species	Common Name	Status
<u>Sorex trowbridgii</u>	Trowbridge shrew	p
<u>S. vagrans</u>	vagrant shrew	p
<u>S. ornatus</u>	ornate shrew	po
<u>Scapanus latimans</u>	broad-handed mole	po
<u>Myotis lucifugus</u>	little brown bat	po
<u>M. evotis</u>	long-eared myotis	po
<u>M. thysanodes</u>	fringed myotis	po
<u>M. volans</u>	hairy-winged myotis	po
<u>M. yumanensis</u>	Yuma myotis	po
<u>M. californicus</u>	California myotis	po
<u>M. subulatus</u>	small-footed myotis	p
<u>Lasionycteris noctivagans</u>	silvery-haired bat	po
<u>Pipistrellus hesperus</u>	western pipistrelle	po
<u>Eptesicus fuscus</u>	big brown bat	po
<u>Lasiurus borealis</u>	red bat	po
<u>L. cinereus</u>	hoary bat	po
<u>Plecotus townsendii</u>	lump-nosed bat	po
<u>Antrozous pallidus</u>	pallid bat	po
<u>Tadarida brasiliensis</u>	Brazilian free-tailed bat	po
<u>Lepus californicus</u>	black-tailed hare	o
<u>Oryctolagus cuniculus</u>	domestic feral rabbit	p
<u>Sylvilagus audubonii</u>	Audubon cottontail	po
<u>S. bachmani</u>	brush rabbit	p
<u>Otospermophilus beecheyi</u>	Beechey ground squirrel	o
<u>Thomomys bottae</u>	Butta pocket gopher	o
<u>Dipodomys heermanni</u>	Heermann kangaroo rat	p
<u>Reithrodontomys megalotis</u>	western harvest mouse	o
<u>R. raviventris</u>	salt marsh harvest mouse	p
<u>Peromyscus maniculatus</u>	deer mouse	o
<u>Microtus californicus</u>	California meadow mouse	o
<u>Ondatra zibethica</u>	muskrat	os
<u>Rattus norvegicus</u>	Norway rat	po
<u>R. rattus</u>	black rat	o
<u>M. musculus</u>	house mouse	o
<u>Canis latrans</u>	coyote	os
<u>C. familiaris</u>	feral dog	os
<u>Urocyon cinereoargenteus</u>	gray fox	po
<u>Procyon lotor</u>	raccoon	os
<u>Mustela frenata</u>	long-tailed weasel	os
<u>Taxidea taxus</u>	badger	p
<u>Spilogale putorius</u>	spotted skunk	os
<u>Mephitis mephitis</u>	striped skunk	os
<u>Felis domesticans</u>	feral cat	o
<u>Odocoileus hemionus</u>	mule deer	p

BIRDS OF NOVATO REGIONAL
SHOPPING CENTER STUDY AREA

(o=species observed
os=signs observed
po=predicted to occur
p=possibly present, not probable.)

Common Name	Status
common loon	p
horned grebe	po
eared grebe	po
western grebe	o
pied-billed grebe	o
double-crested cormorant	o
great blue heron	o
northern green heron	po
cattle egret	p
great egret	o
snowy egret	o
black-crowned night heron	o
American bittern	po
mallard	o
gadwall	po
pintail	o
green-winged teal	o
blue-winged teal	po
cinnamon teal	o
American wigeon	o
northern shoveler	pc
wood duck	p
redhead	p
ring-necked duck	po
canvasback	o
greater scaup	o
lesser scaup	po
tufted duck	p
common goldeneye	p
bufflehead	po
ruddy duck	o
turkey vulture	o
white-tailed kite	o
red-tailed hawk	o
golden eagle	p
marsh hawk	o
merlin	p
American kestrel	o
California quail	o
ring-necked pheasant	o
Virginia rail	po
sora	o
common gallinule	p
American coot	o
killdeer	o
common snipe	o
long-billed curlew	o
greater yellowlegs	o
lesser yellowlegs	po

(c ntinued)

Page Two-Birds of Novato Regional Shopping Center Study Area

Common Name	Status
willet	o
least sandpiper	o
dunlin	po
western sandpiper	o
short-billed dowitcher	po
long-billed dowitcher	o
marbled godwit	o
American avocet	o
black-necked stilt	o
Wilson's phalarope	p
western gull	po
herring gull	o
Thayer's gull	po
California gull	o
ring-billed gull	o
Mew gull	p
Bonaparte's gull	p
Forster's tern	o
Caspian tern	p
rock dove	o
mourning dove	o
barn owl	po
great horned owl	po
burrowing owl Athena	o
short-eared owl	po
Anna's hummingbird	p
belted kingfisher	o
common flicker	o
acorn woodpecker	po
yellow-bellied sapsucker	po
red-naped sapsucker	p
Nuttall's woodpecker	po
western kingbird	po
ash-throated flycatcher	po
black Phoebe	o
Say's phoebe	o
violet-green swallow	p
barn swallow	po
cliff swallow	po
scrub jay	o
yellow-billed magpie	p
common crow	o
plain titmouse	o
bushtit	o
white-breasted nuthatch	po
house wren	p
Bewick's wren	po
long-billed marsh wren	o
mockingbird	o
American robin	po
hermit thrush	p
western bluebird	po
ruby-crowned kinglet	o

Page Three-Birds of Novato Regional Shopping Center Study Area

Common Name	Status
water pipet	o
cedar waxwing	p
loggerhead shrike	o
starling	o
Hutton's vireo	po
yellow-rumped warbler	o
common yellowthroat	po
house sparrow	o
western meadowlark	o
yellow-headed blackbird	p
red-winged blackbird	o
tricolored blackbird	o
northern oriole	p
Brewer's blackbird	o
brown-headed cowbird	po
Lazuli bunting	p
purple finch	po
house finch	o
pine siskin	o
American goldfinch	po
lesser goldfinch	o
Rufous-sided towhee	po
brown towhee	o
Savannah sparrow	o
grasshopper sparrow	p
lark sparrow	o
dark-eyed junco	po
chipping sparrow	p
white-crowned sparrow	o
golden-crowned sparrow	o
fox sparrow	po
Lincoln's sparrow	p
song sparrow	o

APPENDIX D
CLEAN WATER ACT
SECTION 404 EVALUATION

CLEAN WATER ACT
SECTION 404 EVALUATION

Note: This evaluation will consider the impacts of the entire proposed project where applicable (discussed in the Environmental Statement as Alternative #2) although only a portion of the proposed project site is under Section 404 jurisdiction.

I. Project Description. A complete project description is included in this Environmental Statement in paragraph 1.01ff.

A. Fill Material. 350,000 to 400,000 cubic yards of fill material will be excavated from the portion of the study area east of the railroad tracks (Plate 2). The material is younger Bay mud. "It is a soft uniform, gray silty clay containing 45 to 99 percent clay size particles, silt, minor fine sand, and fragments of shells. This soil has a high natural water content, is quite plastic and weak and highly compressible."^{1/} An additional 350,000 - 400,000 cubic yards of fill will be placed on the site supplied by quarries off-site. The composition of this additional material is not known.

B. Description of the Proposed Site for Fill Material. The site proposed to be filled is in Novato, California (Plate 1). The site is former tideland which has been diked off from tidal action and has been used for agriculture. Fill has previously been placed upon the 53 acres of the site north of Lynwood Slough. An old branch of the Lynwood Slough meanders through the southern portion of the site. The old slough supports approximately eight acres of brackish marsh and is under Section 404 and Section 10 jurisdiction. The remainder of the area to be filled south of Lynwood Slough (approximately 46 acres) is within Corps jurisdiction under Section 10. The project site also includes two large hills covered with oak-grassland at the southern end of the property and two smaller hills along the western edge of the property. The excavation site proposed for a lake has been diked off from the tidal action and is sparsely covered with ruderal vegetation. There are also two five-acre drainage ponds in this area.

II. Physical Effects (40 CFR 230.4-1(a)).

A. Potential Destruction of Wetlands. Effects on (40 CFR 230.4-2(a)).

1. Food Chain Production. The proposed project would destroy all the existing vegetation around the old branch of Lynwood Slough. The new Lynwood Slough channel would be replaced by a culvert eliminating primary production. Vegetation associated with the developed project will be limited in quantity and consist of upland plants.

^{1/} Goldman, Harold (E. D.), Geologic and Engineering Aspects of San Francisco Bay Fill Special Report #97, California Division of Mines and Geology, 1969, p. 20 & 21.

2. General Habitat. The proposed project will destroy 8 acres of brackish marsh and will cover the realigned Lynwood Slough. The brush and oak covered knolls will be levelled and covered by the proposed regional shopping center. The project site currently supports 14 species of amphibians and reptiles 38 mammalian species, and about 100 species of birds. A complete listing of species observed on the site is included in Appendix C. The proposed project will destroy the existing habitat. Vegetation after project construction will consist of scattered trees and limited ground cover planted in the parking areas. Tree species have not been specified. Wildlife will probably be limited to rodents and terrestrial birds. The proposed lake will create additional habitat for waterfowl, wading birds, fish and benthic organisms.

3. Areas set aside for aquatic environment study or sanctuaries or refuges. Not applicable. The project site and the surrounding areas do not belong to the category.

4. Natural Drainage Characteristics. Currently the old branch of Lynwood Slough receives runoff from approximately 70 acres to the west of the U. S. Highway 101. In the proposed project, the old slough will be filled and this drainage will be diverted into the covered Lynwood channel culvert(s) and would pass to daylight just west of the railroad tracks and then into the proposed lake on the east side of the railroad line through 60" culverts. A second large culvert will be constructed to drain Novato Creek floodwaters from the low-lying area at the Rowland Boulevard interchange to the west side of the railroad tracks. Additional culverts would be placed through the railroad embankment to discharge directly into the proposed lake.

5. Sedimentation Patterns. Construction activities will involve a temporary increase in erosion on-site and in the borrow area. As a result, the suspended sediment content of water being pumped into Novato Creek is expected to be temporarily increased. The completed project is not expected to affect sedimentation.

6. Salinity Distribution. The proposed project is expected to increase the amount of runoff into Novato Creek from the project site. The increase will not have a significant impact upon salinity distribution in Novato Creek.

7. Flushing Characteristics. Not applicable. The project site is not directly connected to a water body.

8. Current Patterns. Not applicable. The project site is not directly connected to a water body.

9. Wave, Action, Erosion or Storm Damage. During the construction phase of the project erosion may occur. Storm damage may increase. Some damage may occur to the parking areas at the southern end of the proposed project during extremely high tides if the Novato Creek Levees fail. Damage

may also occur during a large flood on Novato Creek if the two culverts crossing the site are obstructed by debris, or their flow capacity reduced by high water levels on the area east of the railroad line. These flood flows would be diverted around the north edge of the proposed buildings to flow over the northern parking areas toward the east. Some damage to adjacent structures may occur.

The placement of fill on the project site will increase flood depths during large flood episodes at Scottsdale Pond, Highway 37 and Highway 101.

10. Storage Areas for Storm and Flood Waters. The proposed project will reduce the total storage available by 350 acre feet. (Four hundred and fifty acre feet would be filled on the site, but excavation of a lake east of the railroad will create an additional storage area of 100 acre feet). This reduction may cause slightly higher ponding levels at Scottsdale Pond during large floods. There will also be a small increase in the frequency of flooding at the Rowland Boulevard interchange. Reduction of storage volume would also reduce the effectiveness of downstream floodwater storage areas to lower flood elevations upstream. The 350 acre-foot reduction represents only a few percent of the total storage available along Novato Creek.

12. Prime Natural Recharge Areas. Not applicable. There are no ground water aquifers underlying the project site.

B. Impact on Water Column.

1. Reduction in Light Transmission. Temporary increased turbidity, during construction is expected in Novato Creek near the Lynwood Slough station discharge point.

2. Aesthetic Values. The appearance of the water in the retention ponds east of the railroad and in Novato Creek would be affected during construction due to turbidity.

3. Direct Destructive Effects on Nektonic and Planktonic Populations. The old Lynwood Slough currently supports seasonal fish populations. The fish and plankton in the slough will be destroyed by the proposed fill. The project is not expected to impact the fish and plankton populations of Novato Creek.

C. Covering of Benthic Communities. The benthic community in both the new and old Lynwood Slough will be destroyed by the proposed project.

D. Other Effects (40 CFR 230.4-1(2)).

1. Changes in Bottom Geometry and Substrate Composition. The slough will be filled to a height suitable for development.

2. Water Circulation. The water which now collects in the old Lynwood Slough will be diverted as explained under Natural Drainage characteristics.

3. Salinity Gradients. Not applicable.

4. Exchange of Constituents Between Sediments and Overlying Water with Alterations of Biological Communities. Not applicable. The proposed fill will not be in contact with a waterway.

III. Chemical - Biological Interactive Effects. Not applicable. The proposed fill will not be in contact with a waterway. However, construction and implementation of the proposed activity will create a new source of urban runoff into the proposed lake and Novato Creek.

IV. Description of site comparison (40 CFR 230.4-1(c)). Not applicable. The fill will not be contact with a waterway.

V. Water Quality Standards. Certification of the proposed project may be required by the California Regional Water Quality Control Board.

VI. Selection of Disposal Site for Dredged or Fill Material (40 CFR 230.5)

A. The filling of the project site is necessary for the proposed development for a 77-acre regional shopping center. Development plans for the remainder of the site have not been submitted. The proposed project is not dependent upon location in a wetland.

B. Alternative considered to the proposed project are discussed in paragraph 1.03 of this Environmental Statement. Impacts expected from each of the alternatives are discussed under the appropriate headings throughout the text.

C. Objectives to be considered in discharge determination (40 CFR 230.5(a)):

1. Impacts on Chemical, Physical, and Biological Integrity of Aquatic Ecosystem (40 CFR 230.5(a)1). The aquatic ecosystem of old Lynwood Slough will be covered by the proposed fill. The proposed project may introduce urban pollutants from the developed area into Novato Creek.

2. Impact on Food Chain. These impacts are discussed in Section II of this evaluation.

3. Impact on Diversity of Plant and Animal Species. Species diversity will decrease. This proposed fill will eliminate the wetland plants and animals in old and new Lynwood Slough. The proposed development will eliminate the existing upland habitat throughout the site. Vegetation after development will be restricted to project landscaping. Animal activity will be limited and consist of terrestrial birds, rodents, and domestic animals.

4. Impact on Movement of Fauna Into and Out of Feedings, Spawning, Breeding and Nursery Areas. The destruction of the wetlands will eliminate an important feeding area for migratory birds.

5. Impact on Wetland Areas Having Significant Functions of Water Quality Maintenance. No significant change. The wetland to be filled contains stagnant water during the dry season and is low in dissolved oxygen. The filling of the slough will not result in a significant reduction of water quality.

6. Impact on Areas That Serve to Retain Natural High Waters of Floodwaters. The proposed filling of the site will eliminate a net of 350 acre-feet of ponding areas for flood waters both from Novato Creek and high tides.

7. Methods to Minimize Turbidity. The ponding areas on the east side of the railroad may experience some turbidity during construction. Specific mitigation plans by the applicant have not been proposed.

8. Methods to Minimize Degradation of Aesthetic, Recreational, and Economic Values. The economic value of the proposed site will be increased by the proposed project. The project will eliminate about 130 acres of open space.

9. Threatened and Endangered Species. No threatened or endangered species are expected to be impacted by the proposed activity.

10. Other Measures That Avoid Degradation of Aesthetic, Recreational, and Economic Values of Navigable Waters. Not applicable. The proposed project will not impact navigable waters as fill is only proposed for land shoreward of existing levees.

D. Impacts on water uses at proposed disposal site (40 CFR 230.5(b)). Not applicable. The proposed filling will not occur in a waterway, but on wetlands. The impact upon wetlands is discussed in Section II of this evaluation.

E. Considerations to minimize harmful effects (40 CFR 230.5(c)). Not applicable. The proposed project does not include any disposal of dredged material.

WILDLIFE OF LYNWOOD SLOUGH, NOVATO

Report to

**U.S. Fish and Wildlife Service
Division of Ecological Services
Sacramento, California**

June 1979

APPENDIX E

REFERENCE:

**SAN FRANCISCO DISTRICT
CORPS OF ENGINEERS
PUBLIC NOTICE 10138-33 (NOVATO CENTER)
CITY OF NOVATO, MARIN COUNTY, CALIFORNIA**

**Prepared by
Gary W. Page and Lynne E. Stenzel
Point Reyes Bird Observatory
4990 State Rout 1
Stinson Beach, California 94970**

INTRODUCTION

Lynwood Slough is located southeast of the junction of Highway 101 and Rowland Boulevard, in the City of Novato, Marin County, California. It consists of approximately 9 acres of former tidal slough that has been diked and become freshwater marsh. It is abutted by abandoned and cultivated fields and two oak-covered knolls. A proposal to fill the slough so that a shopping center can be constructed on the site has prompted the U.S. Fish and Wildlife Service to collect biological data which describe and quantify some of the ecological values of the area. In compliance with that goal this report includes maps that delineate those portions of the slough containing aquatic vegetation and quantifies the number of birds using the area. Evidence for mammalian, reptilian and amphibian use of the area is also documented although in less detail than for the avian species.

PHYSICAL DESCRIPTION OF THE AREA

During former times Lynwood Slough was a tidal meander connected with what is now called Novato Creek. Evidence of the past saline environment is indicated by the presence of *Distichlis spicata* and *Salicornia* sp., two salt marsh plants growing in the slough. Culverts carrying runoff water from Highway 101 and surrounding developed lands are currently the source of freshwater for the slough. At the north end of the slough a 1-2 m wide ditch, hereafter referred to as Lynwood Ditch, drains water from Scottsdale Pond, immediately west of Highway 101, and from Lynwood Slough into Novato Creek. Lynwood Ditch does not completely drain the slough, but because the slough derives its standing water from runoff and the rainy season is limited to late fall, winter, and early spring, the slough probably normally dries up by late summer. When the area was first examined on 21 November 1978

there had already been some rain but the slough was largely without standing water.

The contours of the land surrounding the slough have already been altered by human activities. Some fill has been placed between the slough and Highway 101 and a pile of this fill several meters high sits adjacent to the slough about one half the way along its length. Some of this fill has found its way into the slough and has interrupted the flow of water from south to north. This fill prevents water from the south half of the slough from moving to the north half of the slough and from there out through Lynwood Ditch. It was in the south half of the slough that the only standing water was found when the area was first examined on 21 November.

Beginning at the south end and running towards the north for about 60% of the length of the slough is a levee a few meters high on the east bank. A shallow ditch, immediately east of the levee, parallels the levee along its entire length. Near the north end of the levee an arm of ditch turns abruptly eastward and runs for about 100 m into a field. The field east of the levee is partly cultivated and partly fallow.

Two small, oak-covered knolls several meters high at the southwest and northwest ends of the slough provide patches of relatively undisturbed upland habitat in the otherwise altered setting.

METHODS

Beginning on 21 November 1978 censuses of the birds in Lynwood Slough and the surrounding area were made by walking along the eastern margin of the slough and counting all birds seen. The slough and its immediate environs was divided into six habitats, standing water (W), aquatic vegetation (AV), low terrestrial vegetation (LV), bordering trees (T),

oak-covered knolls (OK), and air (A), and the position of each bird in relation to these habitats was recorded. Notes were also kept on the activities of the birds. As a result of these census procedures we obtained information on the number of birds, the habitats used, and the activities of the birds. Censuses were taken at the rate of two per month until May 1979, the last month of the survey, when four censuses were made. Censuses were made at different times of the day, each census taking between 1-3 hours depending on the number of birds in the area. On 23 January, when four censuses were taken, and 23 March, when three censuses were taken, series of consecutive censuses at different times and tides were made to determine whether time of day or the level of the tide in nearby San Francisco Bay had any affect on the number of aquatic birds likely to be encountered in the slough. In Table 1 census totals given for these dates are the maximum number of birds of each species seen on any single census rather than the number of birds seen on one particular census in the series.

Evidence of mammals, reptiles and amphibians was noted by looking for them or their tracks or droppings during censuses.

In addition to Lynwood Slough, a pond adjoining the south end and a drainage ditch abutting the north end of the slough were examined and the birds found in them recorded.

On some visits to the study site a second observer was present who prepared maps of the aquatic vegetation in the slough. Photographs of some parts of the slough were also taken and are included with the report to give the reader more familiarity with the area.

AQUATIC VEGETATION

Two aquatic plants, a tule (*Scirpus robustus*) and a cat-tail (*Typha latifolia*), form the bulk of the aquatic vegetation in the slough. Parts of the slough are choked by one or both of these species. In addition to the tule and cat-tail some pondweed (*Potamogeton probabilypectinatus*), salt grass (*Distichlis spicata*), pickleweed (*Salicornia* sp.), and brass buttons (*Cotula coronopifolia*) grow in the slough. A small grove of willows (*Salix* sp.) growing between Highway 101 and the slough also attest to the aquatic nature of the area. The distribution of the major aquatic vegetation along the slough is illustrated in Appendix 1.

SLOUGH AVIFAUNA

From censuses of the slough and its immediate environs 49 species of birds were recorded. These represent 62% of the 79 species seen over a wider area which included man-made ponds about 0.5 km east of the slough and Novato Creek between Highways 101 and 37. A list of the species seen over the wider area during this study, giving numbers by date for those seen in the slough and its immediate environs, is presented in Table 1.

Standing Water. Standing water was probably the major component of the environment drawing six species to the area. These included the Great Blue Heron, Great Egret, Black-crowned Night Heron, Mallard, Common Gallinule and American Coot. All these species were encountered in small numbers (Table 1). The herons and egrets fed in the slough but did not nest there. Mallards, Common Gallinules and American Coots fed in the slough and a pair of each probably nested there, although no positive evidence for this was found. A brood of Mallards was observed on two dates on the pond immediately south of the slough.

Species	21 Nov	6 Dec	26 Dec	9 Jan	23 Jan	6 Feb	27 Feb	8 Mar	23 Mar	5 Apr	19 Apr	1 May	3 May	9 May	23 May
Pied-billed Grebe															
Double-crested Cormorant															
Great Blue Heron <i>W, OK</i>			2							1			1		
Green Heron															
Great Egret <i>W</i>					1		1								
Snowy Egret															
Black-crowned Night Heron <i>OK</i>				3											
Mallard <i>W</i>		2		2	2			6	2	2	2		2		2
Pintail															
Green-winged Teal															
Cinnamon Teal															
Northern Shoveler															
Redhead															
Canvasback															
Greater Scaup															
Lesser Scaup															
Common Goldeneye															
Bufflehead															
Ruddy Duck															
Turkey Vulture <i>A, OK</i>	1		1		1			1	11	1	1		3	1	3
White-tailed Kite <i>A, OK</i>	2	1	1	1											
Sharp-shinned Hawk <i>T, A</i>	1		1	1	1										
Red-tailed Hawk <i>A, OK</i>	1	1	1		1										
Red-shouldered Hawk <i>A, OK</i>					1	1		1							1
Marsh Hawk															

Table 1. List of birds seen in the area of Lynwood Slough giving numbers by date for those actually associated with the slough and bordering vegetation. *W* = water, *AV* = aquatic vegetation, *LV* = low terrestrial vegetation, *T* = bordering trees, *OK* = oak knolls, and *A* = air. These codes indicate the parts of the slough where birds were seen.

Species	21 Nov	6 Dec	26 Dec	9 Jan	23 Jan	6 Feb	27 Feb	8 Mar	23 Mar	5 Apr	19 Apr	1 May	3 May	9 May	23 May
Prairie Falcon															
American Kestrel <i>A, OK, T</i>			1	1	2		2	1	1	1			1	2	2
California Quail <i>LV, AV, T</i>	15	19	40	25	39	23			1		2			3	3
Virginia Rail															
Common Gallinule <i>W, AV</i>									2					1	
American Coot <i>W</i>							1	1	1		2	1		1	
Killdeer <i>LV</i>								1						2	2
Greater Yellowlegs															
Common Snipe															
Long-billed Dowitcher															
Least Sandpiper															
Dunlin															
Mew Gull															
Mourning Dove <i>OK, LV, T</i>						1		1	1		3		2	6	6
Vaux's Swift <i>A</i>														1	
Allen's Hummingbird <i>T</i>								1							
Belted Kingfisher															
Red-shafted Flicker <i>OK, T</i>				1	1					1					
Downy Woodpecker <i>OK</i>				1											
Nuttall's Woodpecker <i>OK</i>														1	
Black Phoebe <i>A, AV, OK</i>		1		1	3	3		2	2					2	
Say's Phoebe															
Violet-green Swallow															
Rough-winged Swallow															
Barn Swallow <i>A</i>										2	2			2	1
Cliff Swallow <i>A</i>														7	2
Scrub Jay <i>T, OK</i>												2		1	

Table 1. Continued

<u>Species</u>	21 Nov	6 Dec	26 Dec	9 Jan	23 Jan	6 Feb	27 Feb	8 Mar	23 Mar	5 Apr	19 Apr	1 May	3 May	9 May	23 May
Common Crow <i>OK</i>			1					2	2						
Plain Titmouse <i>OK</i>												2			3
Bushtit <i>T, OK</i>			5		8				5	5			4	2	
Long-billed Marsh Wren															
Mockingbird <i>T</i>											1			2	1
Western Bluebird <i>OK</i>													1		
Ruby-crowned Kinglet <i>T</i>		1	4		1										
Water Pipit															
Loggerhead Shrike <i>T</i>		1	1												
Yellow-rumped Warbler <i>T, OK</i>		4	7	14											
Western Meadowlark <i>LV, OK</i>		1										2			
Red-winged Blackbird <i>AV, T, OK</i>				42	2		1	30	20	19	74	68	100	87	98
Northern Oriole <i>OK</i>													1	4	1
Brewer's Blackbird <i>OK</i>					3										
Brown-headed Cowbird <i>OK</i>														1	
Purple Finch <i>T</i>		5													
House Finch <i>LV, T, OK</i>	25	117	177	79	471	123	137	238	49	8	5		3	7	3
Pine Siskin <i>T</i>			1												
American Goldfinch <i>T, OK</i>		3								1	1		2	3	5
Brown Towhee <i>LV</i>					2										
Savannah Sparrow <i>LV</i>		2		2											
Dark-eyed Junco <i>OK</i>					12										
White-crowned Sparrow <i>LV, T, AV</i>	68	37	44	40	65	4	23	21	40	4	4				
Golden-crowned Sparrow <i>LV, AV, T</i>	1	15	12		5				9	17	3				
Song Sparrow <i>LV, AV, OK</i>	3	9	13	7	7	3	10	12	18	11	7	3	7	15	8
Ring-necked Pheasant <i>OK</i>											1				
European Starling <i>OK, T</i>									2		8	3			

Table 1. Continued.

Aquatic vegetation. Aquatic vegetation was the primary feature attracting Red-winged Blackbirds to the area. Blackbird nests were easy to find in the cat-tails in May. Census totals for male and female Red-winged Blackbirds for April and May give some idea of the numbers nesting on the 9 acres (Table 2). Being polygynous males may mate with more than one female so that female rather than male numbers are more likely equal to the number of nests.

<u>Date</u>	<u>Males</u>	<u>Females</u>
19 Apr	38	36
1 May	32	36
3 May	36	64
9 May	29	58
23 May	25	55

Table 2. Numbers of male and female Red-winged Blackbirds on nine-acre Lynwood Slough.

The tules and cat-tails also were of importance to the Common Gallinule which fed in their cover, to Black Phoebes which used them as hunting perches, and to Song Sparrows which used them as singing perches. California Quail, White-crowned Sparrows and Golden-crowned Sparrows were sometimes flushed from the tules and may have been feeding there. Thus the aquatic vegetation was of value to at least seven species.

Low Terrestrial Vegetation. Ten species of birds were associated with low growing terrestrial vegetation on the levee or along other borders of the slough. Up to 40 California Quail, 2 Killdeer, 6 Mourning Doves, 2 Western Meadowlarks, 471 House Finches, 2 Brown Towhees, 2 Savannah Sparrows, 68 White-crowned Sparrows, 17 Golden-crowned Sparrows and 18 Song Sparrows appeared in low growing vegetation during one or more censuses (Code LV in Table 1). All these species foraged in the area. The quail, White-crowned Sparrows, Golden-crowned Sparrows, and Song Sparrows also probably foraged to some extent

in the aquatic vegetation. The quail, meadowlark and Song Sparrows almost certainly nested in the low growing terrestrial vegetation. A pair of Killdeers nested on the gravel fill immediately west of the slough. Because of the heavy vegetation bordering the slough these Killdeers appeared to confine their activities to the fill area and did not come down to the slough waters to feed.

Trees Bordering Slough. Twenty species of birds occurred in the trees bordering the slough (code *T* in Table 1). These included the Sharp-shinned Hawk, American Kestrel, California Quail, Mourning Dove, Allen's Hummingbird, Red-shafted Flicker, Scrub Jay, Bushtit, Mockingbird, Ruby-crowned Kinglet, Loggerhead Shrike, Yellow-rumped Warbler, Red-winged Blackbird, Purple Finch, House Finch, Pine Siskin, American Goldfinch, White-crowned Sparrow, Golden-crowned Sparrow and European Starling. The Mourning Dove, American Goldfinch and Mockingbird were the three species that probably bred in the trees adjacent to the slough.

Oak-covered Knolls. The oak-covered knolls provided a relatively undisturbed habitat in the area. A total of 29 species of birds were found at one time or another on these knolls. These species are indicated by the code *OK* in Table 1. Several species of hawks used trees on the knolls for perches and a pair of American Kestrels probably nested on the knoll by the south end of the slough. On two different occasions this pair of hawks was observed making food exchanges here. Plain Titmice and Mourning Doves probably also nested in the oaks on the knoll. Most species used the trees as perches and the Red-shafted Flicker, Downy Woodpecker, Nuttall's Woodpecker, Plain Titmouse, Yellow-rumped Warbler and Northern Oriole definitely foraged in them.

Aerial Foragers. A final habitat, the air space over the standing water in the slough (code *A* in Table 1), provided a foraging area for at least four

species of birds that ate insects attracted to or dependent on the slough for some part of their life cycle. These included the Vaux's Swift, Barn Swallow, Cliff Swallow, and Black Phoebe. Small numbers of these species occurred on some censuses. A pair of Black Phoebes nested in a farm shed at the south end of the slough.

AQUATIC BIRD USE OF THE SLOUGH

Six species of aquatic birds, the Great Blue Heron, Great Egret, Black-crowned Night Heron, Mallard, Common Gallinule and American Coot, were found on the slough on one or more censuses. None of these species ever exceeded six individuals during a particular census. Series of censuses conducted on 23 January and again on 23 March failed to turn up significantly more birds when the tide was high than when it was low in San Francisco Bay. Thus there was no evidence that some birds might fly from San Francisco Bay to forage in the slough when tidal conditions did not favor their feeding in the bay.

Waterbird use of Lynwood Slough probably would have been greater had it held a significant area of standing water year round. Aquatic insects and other invertebrates must perish when the slough dries up in late summer. The repopulation of this food resource for birds probably proceeds rather slowly during the cold winter months after the first rains fill the slough. During the course of the study we noticed that the number of a small aquatic insect, water boatmen (Corixidae), gradually increased in the waters throughout the slough, indicating such a phenomenon.

In central California aquatic birds use wetland habitat as staging areas during spring and fall migration, as overwintering areas, and as breeding areas. Because Lynwood Slough is largely dry during late summer and fall its use as a fall migrational staging area must be very limited to non-existent.

No censuses were taken during this period, however, so that we cannot say for certain what use is made of the area at that time. The herons and egrets found at the slough were wintering in the area; the Mallards, coots and gallinules wintered and probably bred in the area. There was no evidence that any waterbird made use of the slough as a staging area during spring migration.

Information on past use of Lynwood Slough by waterbirds is minimal. Ed O'Conner of Bolinas who has hunted the area in the past has mentioned finding coots and Mallards at the site and Beverly Ehrth of Novato mentions the same species as well as nesting Red-winged Blackbirds. Our census results are consistent with these observations. Harvey, Savage, Hopkins and Hale (1978) give a long list of species seen in the general area in November and December 1978 but do not specify the number of individuals seen or the exact location of the sightings.

AQUATIC BIRD USE OF AREAS ADJACENT TO LYNWOOD SLOUGH

Three areas abutting Lynwood Slough held standing water during the winter and provided potential habitat for waterbirds. At the south end of the slough, separated from the slough by a roadway and earth dam, was a small farm pond, less than 1 acre in size. There was some *Scirpus* along the borders of the pond but it was primarily an area of open water. Eleven species of aquatic birds were found on this pond during the censuses (Table 3). Some of these birds such as the coot, Mallard and Great Egret were undoubtedly the same individuals that used the slough at other times but some species such as the Belted Kingfisher and Snowy Egret occurred several times on the pond but were never seen on the slough.

Species	21 Nov	6 Dec	26 Dec	9 Jan	23 Jan	6 Feb	27 Feb	8 Mar	23 Mar	5 Apr	19 Apr	1 May	3 May	9 May	23 May
Pied-billed Grebe			1						2	2					
Green Heron															1
Great Egret					1	1						1			
Snowy Egret			1	3	4	1									
Mallard											1	8*	10**		
Lesser Scaup						2									
Common Goldeneye					1										
Common Gallinule			1	1											
American Coot					1	1		1	1	1					
Killdeer					2										
Belted Kingfisher	1	1	1	1	1	1		1							

Table 3. Aquatic birds seen on the farm pond at the south end of Lynwood Slough.
 * is a female attending seven young, ** a female attending nine young.

The narrow ditch that paralleled and lay immediately east of the southern part of the slough held standing water after the rains but supported few birds. There were some small stands of tule in the ditch and some Red-winged Blackbirds nested in these; however, other than one Great Blue Heron standing in this ditch on one occasion, no waterbirds were seen here.

Birds in Lynwood Ditch, a channel that drains the north end of Lynwood Slough, were counted between the highway and the railway tracks to the east. This narrow ditch held standing water and was fairly heavily vegetated with cat-tails and tules. Six species of aquatic birds were found using the area. Many of the sparrows that were found along the banks of Lynwood Slough were also found along the banks of Lynwood Ditch (Table 4).

<u>Species</u>	6 Dec	26 Dec	9 Jan	23 Jan	6 Feb	27 Feb	8 Mar	23 Mar	5 Apr	19 Apr	1 May	9 May	23 May
Great Blue Heron				1	1	1							
Great Egret					1								
Snowy Egret			2										
Mallard								2		1			
Cinnamon Teal				1									
California Quail										2	2	2	
Killdeer										1	2	2	2
Say's Phoebe	1												
Barn Swallow										2		2	
Western Meadowlark													1
Red-winged Blackbird					1			1	2	5	8	13	9
House Finch		18		1	69								
Savannah Sparrow	3	3						1	1	1			
White-crowned Sparrow		2				2	2						
Golden-crowned Sparrow		8		1			6						
Scng Sparrow		3		2	2		3	2	1	1		2	2

Table 4. Birds seen on censuses of Lynwood Ditch.

MAMMALS, REPTILES AND AMPHIBIANS

From tracks or actual sightings, the presence of eight different species of mammals was confirmed for Lynwood Slough. The evidence for the presence of each species is summarized in Table 5.

Species	21 Nov	6 Dec	26 Dec	9 Jan	23 Jan	6 Feb	27 Feb	8 Mar	23 Mar	5 Apr	19 Apr	1 May	3 May	9 May	23 May
<i>Lepus californicus</i>	3	9	7	3	2		2	4	6	4	4	1	1	4	6
<i>Otospermophilus beecheyi</i>											1			1	
<i>Ondatra zibethica</i>			2		1			1	3		1				
<i>Canis familiaris</i>		tk	tk				tk								
<i>Procyon lotor</i>	tk	tk			tk					tk	tk				
<i>Mephitis mephitis</i>											tk				tk
<i>Felis domestica</i>			1												
<i>Odocoileus hemionus</i>	tk	tk	tk		tk			tk			tk				1

Table 5. List of mammals found at Lynwood Slough. tks = tracks, indirect evidence for the species' presence. *L. californicus* is Blacktail Jackrabbit, *O. beecheyi* is Beechey Ground Squirrel, *O. zibethica* is Muskrat, *C. familiaris* is Domestic Dog, *P. lotor* is Raccoon, *M. mephitis* is Striped Skunk, *F. domestica* is feral cat, and *O. hemionus* is Mule Deer.

In addition to the mammals listed in Table 5 small rodents that were seen too briefly to be identified occurred in the area. Work done by Harvey, Savage, Hopkins, and Hale (1978) indicates that the House Mouse (*Mus musculus*), Deer Mouse (*Peromyscus maniculatus*), California Vole (*Microtus californicus*), Western Harvest Mouse (*Reithrodontomys megalotis*), and Black Rat (*Rattus rattus*) are among the small rodents inhabiting the slough area.

Two species of reptiles, the Western Fence Lizard (*Sceloporus occidentalis*) and garter snake (*Thamnophis* sp.) were observed at the slough during the course of the study. The lizards occurred on the slough levee. The garter snake, which may have been the Western Aquatic Garter Snake (*Thamnophis couchi*) was seen only once, swimming under water in the slough. The Western Pond Turtle (*Clemmys marmorata*) occurred in the farm pond at the south end of the slough

and judging by the presence of droppings on a board floating in the slough may have also have occurred there although none were seen.

Two species of amphibians were found in the slough. These were the Pacific Tree Frog (*Hyla regilla*), which were heard singing and were seen at the south end of the slough, and the Bullfrog (*Rana catesbeiana*), which were seen at the north end of the slough.

SUMMARY

The 9-acre Lynwood Slough is a wetland with standing water during winter, spring and early summer. Cat-tail and tule are the dominant emergent vegetation in the freshwater slough. At least 49 species of birds, 13 species of mammals, 2 species of reptiles, and 2 species of amphibians were found in the slough or along its borders between November 1978 and May 1979. Standing water was the primary factor attracting six species of aquatic birds to the area, and aquatic vegetation the factor attracting one other species. Ten species of birds were associated with low growing terrestrial vegetation adjacent to the slough and 20 species were associated with trees bordering the slough. Twenty-nine species of birds occurred on two oak knolls that lay adjacent to the slough. The air space over the slough was utilized by four species of aerial foragers. Aquatic bird use of the area would probably have been greater if there had been a significant amount of standing water year round.

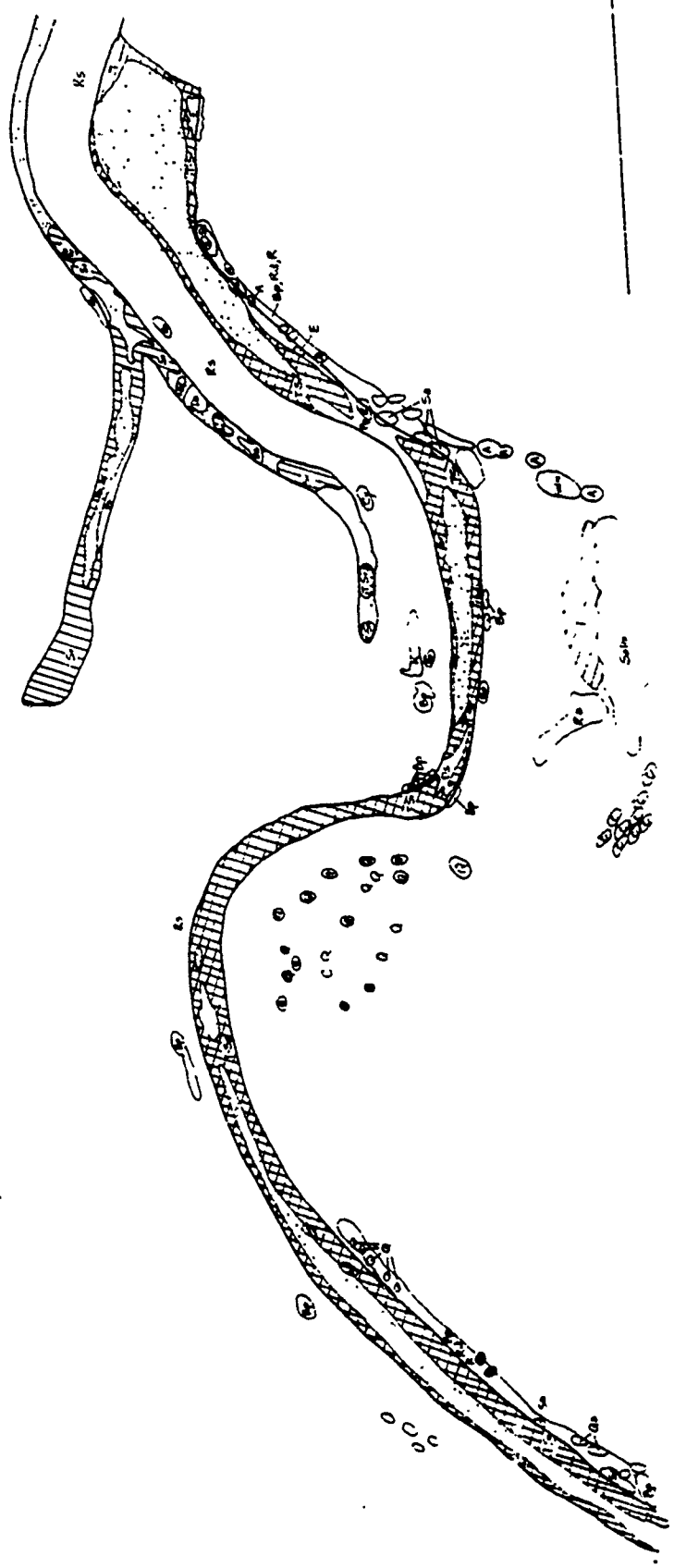
LITERATURE CITED

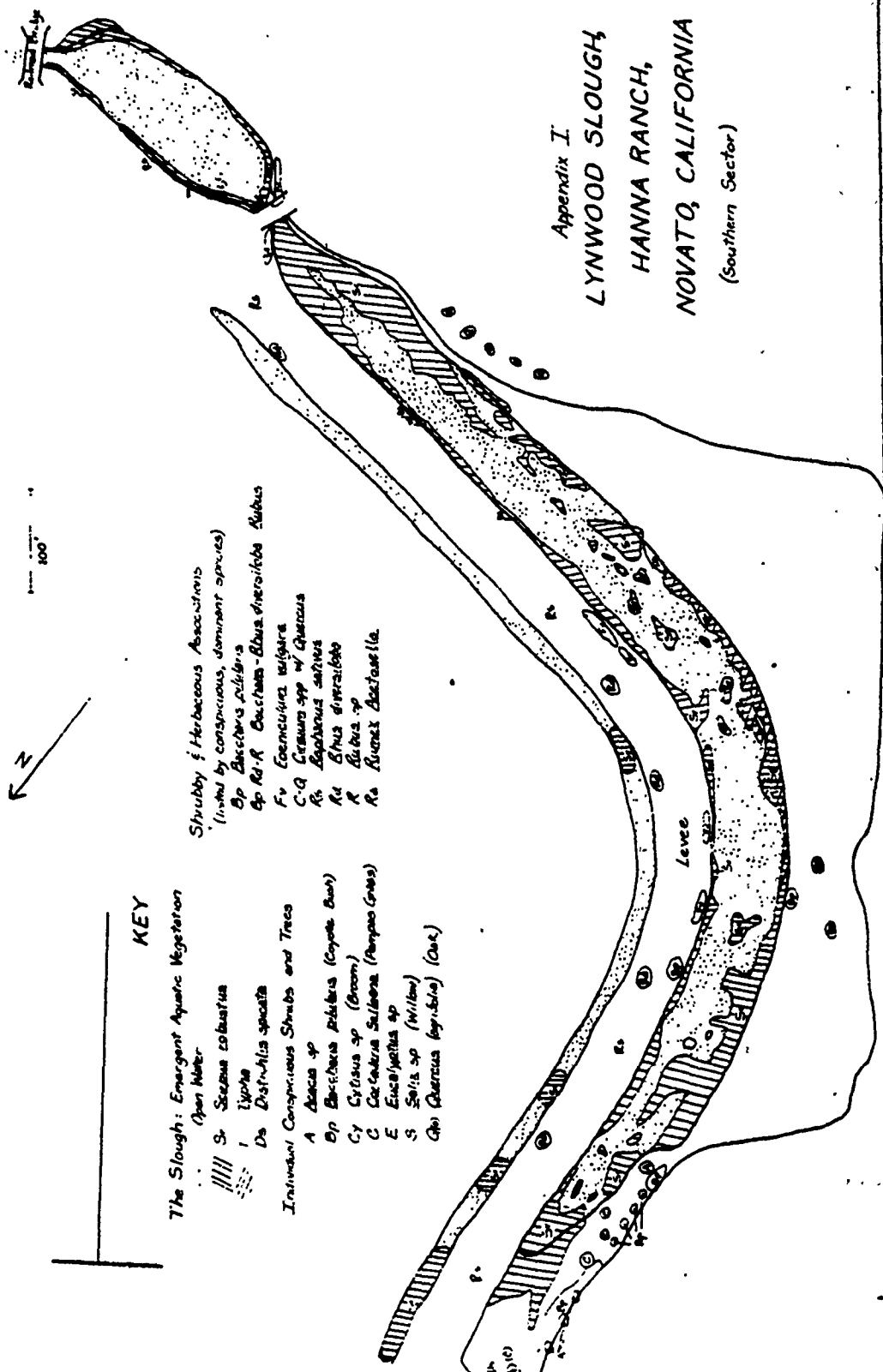
Harvey, H. T., W. Savage, N. Hopkins and J. M. Hale. 1978. Novato regional shopping center technical report on vegetation and wildlife. Report to Environmental Impact Planning Corporation -- no address given.

Appendix I
LYNWOOD SLOUGH,
HANNA RANCH,
NOVATO, CALIFORNIA
(Northern Sector)

For Key to Symbols: See Southern Sector of Map

100'





Appendix I
 LYNWOOD SLOUGH,
 HANNA RANCH,
 NOVATO, CALIFORNIA
 (Southern Sector)

100'
 N

KEY

- The Slough: Emergent Aquatic Vegetation
 (Open Water)
- ||||| *Saxifraga cespitosa*
 - ||||| *Lycina*
 - ||||| *Dra. Distichlis spicata*
- Individual Conspicuous Shrubs and Trees
- A *Abies* sp.
 - Bp *Baccharis pilularis* (Coyote Bush)
 - Cy *Cytisus* sp. (Broom)
 - C *Callitris Salicina* (Pompeo Grass)
 - E *Eucalyptus* sp.
 - S *Salix* sp. (Willow)
 - Gq *Quercus agrifolia* (Oak)

- Shrubby & Herbaceous Associates
 (Included by conspicuous, dominant species)
- Bp *Baccharis pilularis*
 - Sp Rd R *Cochlosoma - Elousa diversifolia* *Aubus*
 - Fv *Eriogonum vilgare*
 - C-G *Ceanothus* spp. w/ *Quercus*
 - Rp *Raphanus sativus*
 - Rt *Rhus diversifolia*
 - R *Rubus* sp.
 - Ra *Rumex acetosella*

Highway 101

<u>Date</u>	<u>Time</u>	<u>Weather</u>	<u>Observers*</u>
21 Nov 78	1330-1445	partly overcast, wind light	GP, JT
6 Dec 78	1030-1200	not recorded	GP, LS
26 Dec 78	1030-1130	foggy, calm	GP
9 Jan 79	1510-1610	overcast with drizzle	LS
23 Jan 79	1000-1030	overcast	GP
"	1200-1230	overcast	GP
"	1400-1430	mainly clear	GP
"	1600-1630	mainly clear	GP
6 Feb 79	1330-1445	clear, light winds	LS
27 Feb 79	1315-1415	partly overcast, light winds	LS
8 Mar 79	0800-0910	foggy and calm	LS
23 Mar 79	0900-1010	clear with light winds	GP, LS
"	1245-1345	"	GP, LS
"	1600-1700	"	GP, LS
5 Apr 79	1200-1300	clear with light winds	GP
19 Apr 79	1200-1330	clear with light winds	GP
1 May 79	1400-1520	partly overcast with moderate winds	LS
3 May 79	0815-1025	overcast with light winds	LS
9 May 79	0915-1045	clear and calm	GP
"	1145-1315	"	GP
23 May 79	0930-1230	clear with light winds	GP, LS

Appendix 2. Dates, times, weather and observers on censuses.

* GP is Gary Page, LS is Lynne Stenzel, and JT is Joseph Tieger.

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