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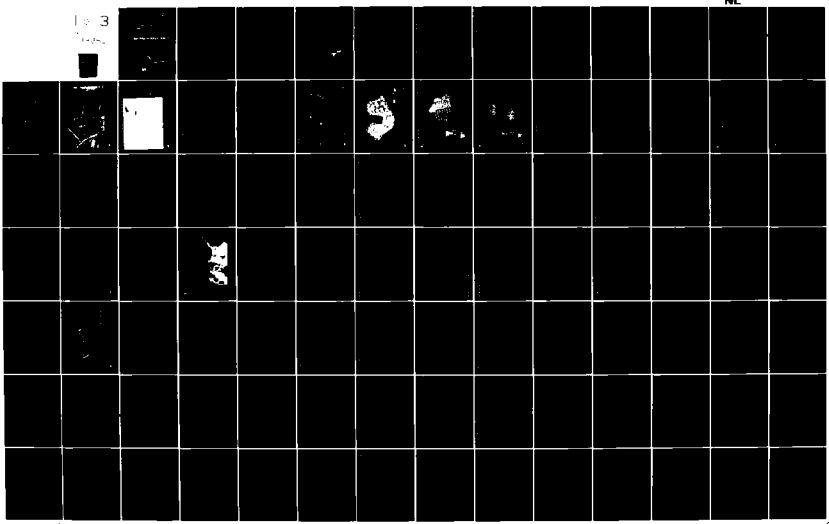

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ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT

Bel Marin Keys Unit 5

Marin County Planning Department
U.S. Army Corps of Engineers

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

9 SEP 1982

SPNMD-TE

SUBJECT: Bel Marin Keys Unit 5 Draft Environmental Impact Report/Environmental Impact Statement - Regulatory Permit Application Marin County, California Public Notice No. 14336N33: Comment Period

TO WHOM IT MAY CONCERN:

1. As announced in Public Notice No. 14336N33 (14 December 1981), Home Savings and Loan Association, 3731 Wilshire Boulevard, Los Angeles, CA 90010 has applied for Department of the Army authorization under Section 10 of the River and Harbor Act of 1899 and under Section 404 of the Clean Water Act to construct a lagoon-oriented, predominately residential development and recreational marina adjacent to Novato Creek, California.

2. This Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) has been prepared by the Marin County Planning Department and the U.S. Army Corps of Engineers, San Francisco District to comply with the environmental impact document requirements of the California Environmental Quality Act and the National Environmental Policy Act. A joint State/Federal environmental document has been prepared so as to minimize the duplication of effort in the local, state and federal permit processes.

3. This Draft EIR/EIS is now being circulated to appropriate government agencies, interested organizations and the public for review and comment. Please submit your comments to the District Engineer, San Francisco District by the date indicated on the cover sheet (which follows the title page) so they may be considered along with other relevant information in preparing the Final EIR/EIS.

4. Copies of the Draft EIR/EIS are available for review by contacting the San Francisco District (415) 974-0444.

Edward M. Lee Jr.

EDWARD M. LEE, JR.
LTC, CE
District Engineer

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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- Appendices are bound in a separate volume

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Waterfront residential/commercial development

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
Joint State/Federal environmental impact document concerning a regulatory permit application by Home Savings & Loan under Section 10 the River and Harbor Act of 1899 and Section 404 of the Clean Water Act. The proposed project involves waterfront residential/commercial development on approximately 735 acres with an additional estimated 875 acres to be committed to open space and environmental enhancement.

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This Environmental Impact Report/Environmental Impact Statement (EIR/EIS) was prepared by Torrey & Torrey Inc., San Francisco, California, to conform to the National Environmental Policy Act (NEPA), Council on Environmental Quality Regulations, Corps of Engineers' EIS Regulations, California Environmental Quality Act (CEQA) and State and County EIR Guidelines. Torrey & Torrey Inc. has used its best efforts to prepare an inclusive environmental impact report by identifying and evaluating possible environmental impacts and possible measures to mitigate adverse impacts of the proposed project, and considering alternatives to the project as proposed.

This EIR/EIS is intended to be a full disclosure document and is provided solely to assist in the evaluation of the proposed project. Torrey & Torrey Inc. shall not be liable for costs or damages of any client or third parties caused by use of this document for any other purposes, or for such costs or damages of any client or third parties caused by delay or termination of any project due to judicial or administrative action, whether or not such action is based on the form or content of this report or portion thereof prepared by Torrey & Torrey Inc.

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Draft
Environmental Impact Report/
Environmental Impact Statement

BEL MARIN KEYS UNIT 5
Regulatory Permit Application Number 1466N33
Marin County, California

Prepared for

Marin County Planning Department
U.S. Army Engineer District, San Francisco, California

By

Torrey & Torrey Inc.
One Sutter Street, Suite 707
San Francisco, California 94104

September 1982

DRAFT
ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT
BEL MARIN KEYS UNIT 5, MARIN COUNTY, CALIFORNIA
REGULATORY PERMIT APPLICATION BY HOME SAVINGS AND LOAN
PUBLIC NOTICE NO. 14336N33

COVER SHEET

A. ABSTRACT

Home Savings and Loan Association has applied to the U. S. Army, Corps of Engineers, San Francisco District, for a permit under Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act authorizing the excavation of approximately 9,000,000 cubic yards of earth to construct a 546 acre lagoon. The excavated material would be used to construct streets, levees and building pads for 1178 dwelling units on an additional 189 acres. The application also identifies the proposed construction of a 602 berth marina with deep water access to San Pablo Bay and Novato Creek via a navigational lock. The Marin County Planning Department completed an initial study which identified possible significant environmental impacts. The Corps of Engineers and Marin County have been designated as lead agencies for the preparation of a joint Environmental Impact Report/Environmental Impact Statement (EIR/EIS) to further identify the potential environmental consequences of the proposed project and several alternatives which were developed by Marin County and the Corps of Engineers.

B. LEAD AGENCY CONTACTS

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C. REVIEW PERIOD

This Draft EIR/EIS has a 45-day period for public review. All written comments must be submitted to either of the designated lead agency contacts by 1 NOV 1982 (or the end of the 45-day comment period specified by the Notice of Availability published in the Federal Register or specified by the County's Notice of Completion, whichever is later). Oral and written comments may also be presented at the public hearing on this document.

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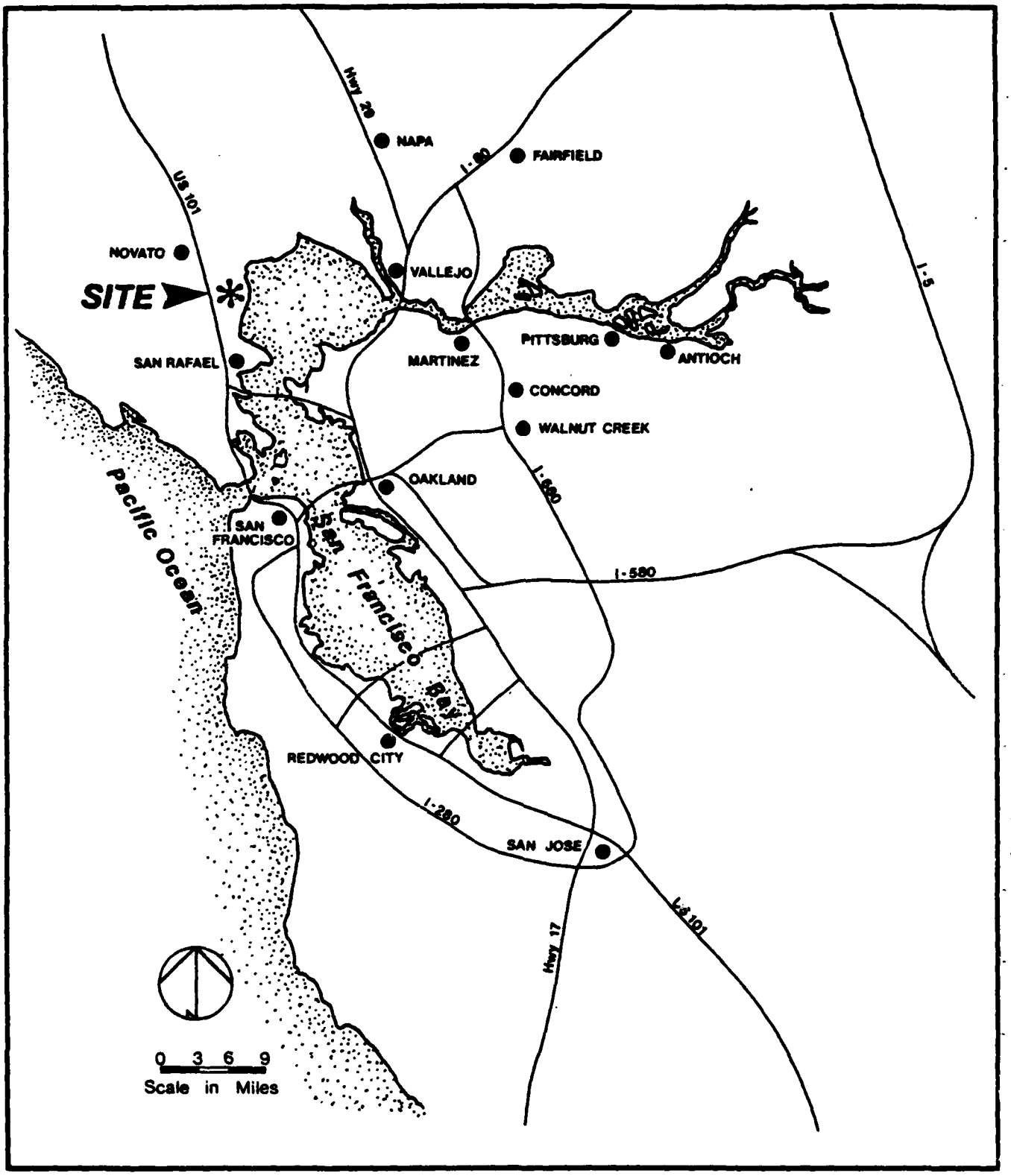
A. INTRODUCTION

This Environmental Impact Report/Environmental Impact Statement (EIR/EIS) has been prepared to meet the requirements of both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) as part of the local, state, and federal permitting process for a proposed project.

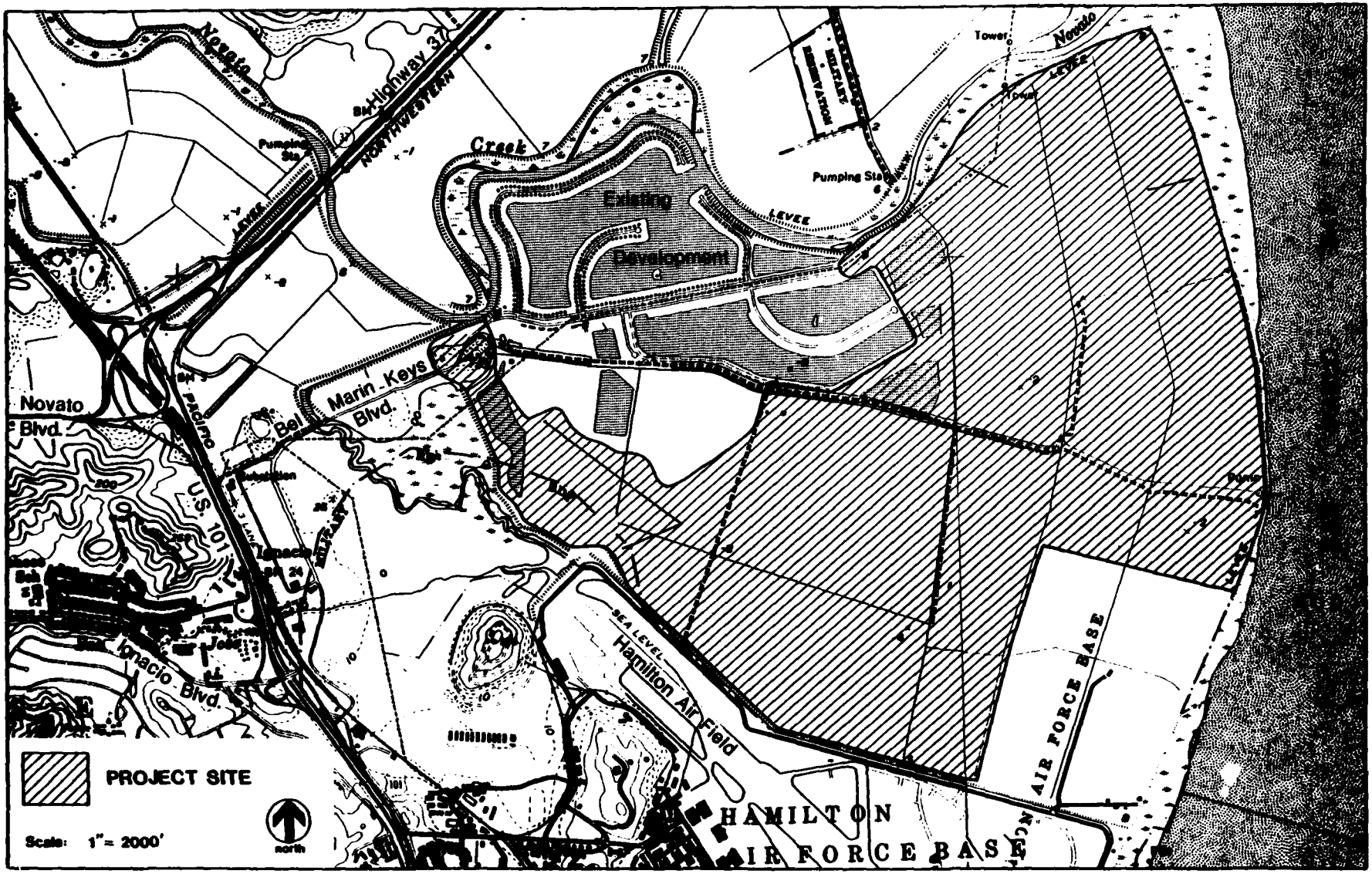
Marin County determined that an EIR would be required for the 1610 acre residential and commercial project on the basis of an Initial Study completed on August 17, 1981. As part of the project application, the County required the developer to submit a report on Inclusionary Housing. That report, entitled "Inclusionary Housing for Bel Marin Keys Unit 5," has been prepared by Torrey & Torrey Inc. under separate cover.

The project developer, Home Savings and Loan, applied for a U.S. Army Corps of Engineers permit (number 14366N33) on February 10, 1981. A Corps permit is required for the project pursuant to Section 404 of the Clean Water Act and Section 10 of the River and Harbor Act of 1899. The Corps required the preparation of an EIS based on its determination that the proposed project would have significant effects on the environment.

The Draft EIR/EIS will be circulated through the State Clearinghouse to all permitting and review agencies for review and comment. In accordance with CEQA and NEPA requirements, this document will be available to the public with public hearings provided for comment.



TORREY & TORREY INC. environmental/urban planning and design	REGIONAL LOCATION	EXHIBIT A1



TORREY & TORREY INC. environmental/urban planning and design	Project Location	EXHIBIT A2

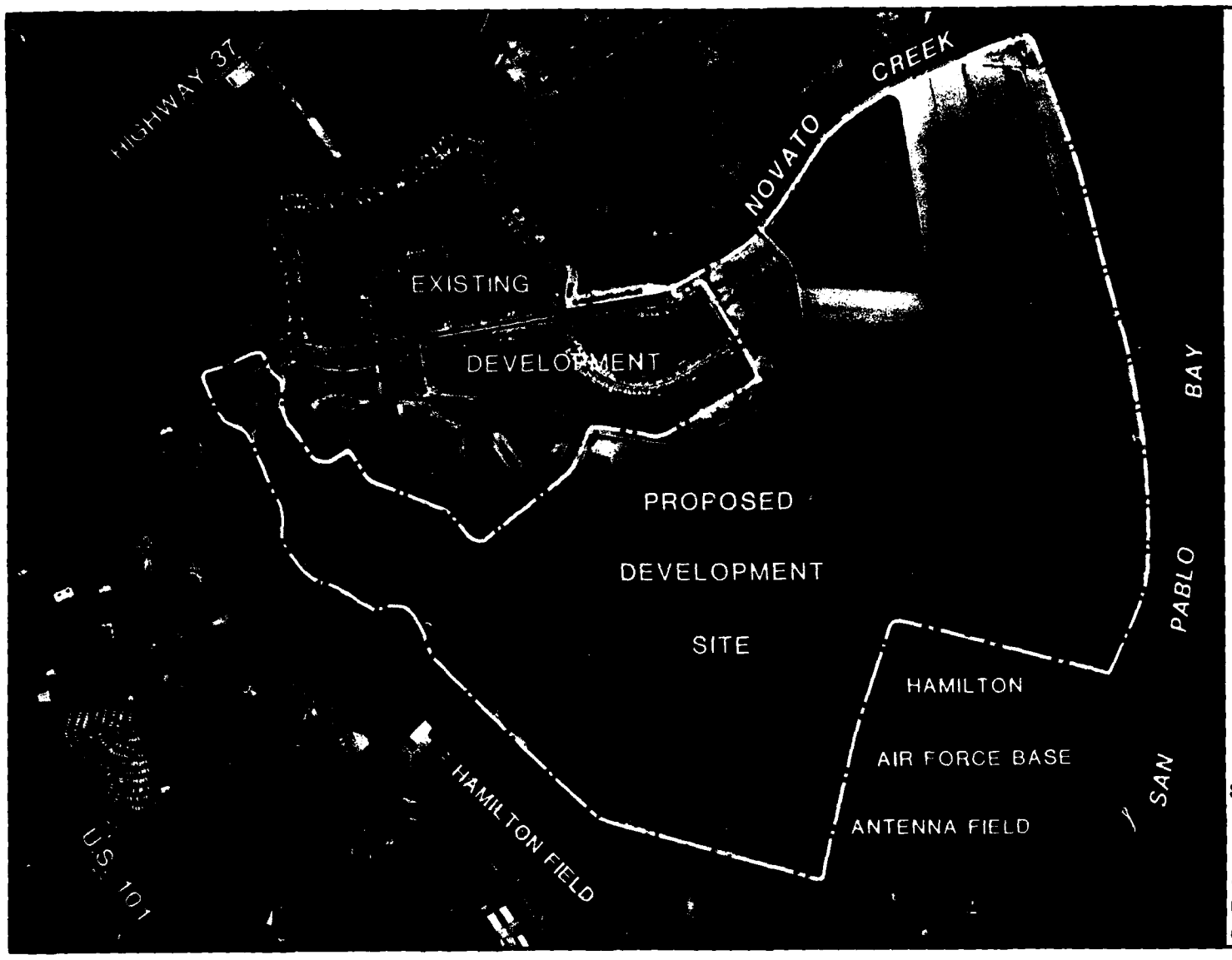


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Photo Source: U.S. ARMY CORPS OF ENGINEERS

TORREY & TORREY INC. 2T environmental/urban planning and design	Aerial View of Site	EXHIBIT A3

B. DESCRIPTION OF THE PROPOSED PROJECT AND ALTERNATIVES

This chapter describes in detail the project as proposed by the applicant (Alternative A) and the Alternatives B through E which were defined by joint agreement of the Marin County Planning Department and the Corps of Engineers. A summary of the alternatives is as follows:

Alternative A - Project as Proposed With On-site Mitigation
Alternative B - Project as Proposed But Without Marina
Alternative C - Project as Proposed But With Off-site Mitigation
Alternative D - Reduced Scale Project With On-site Mitigation
Alternative E - Reduced Scale Project With Off-site Mitigation
Alternative F - No Project

The Corps of Engineers has established categories by which an alternative may be defined. These categories are:

i Within the capability of applicant and within the jurisdiction of the Corps

ii Within the capability of applicant but outside the jurisdiction of the Corps

iii Reasonable, foreseeable but outside capability of applicant and within jurisdiction of Corps

iv Reasonable, foreseeale but outside capability of applicant and outside jurisdiction of the Corps.

Alternatives A, B, D and F are all within the first category (i). Alternatives C and E may be in categories i, ii, iii, or iv, depending upon the size and location of an off-site mitigation area.

ALTERNATIVE A - PROJECT AS PROPOSED

Home Savings and Loan is proposing completion of Bel Marin Keys, a water oriented community in Marin County, with construction of Bel Marin Keys Unit 5. The Master Plan for Unit 5 involves a site of 1610 acres with 735 acres to be developed and 875 acres to be committed to open space and environmental improvement. The 875 acres, referred to as the "mitigation area," are being included by the developer to mitigate the loss of seasonal wetlands which will result from the project.

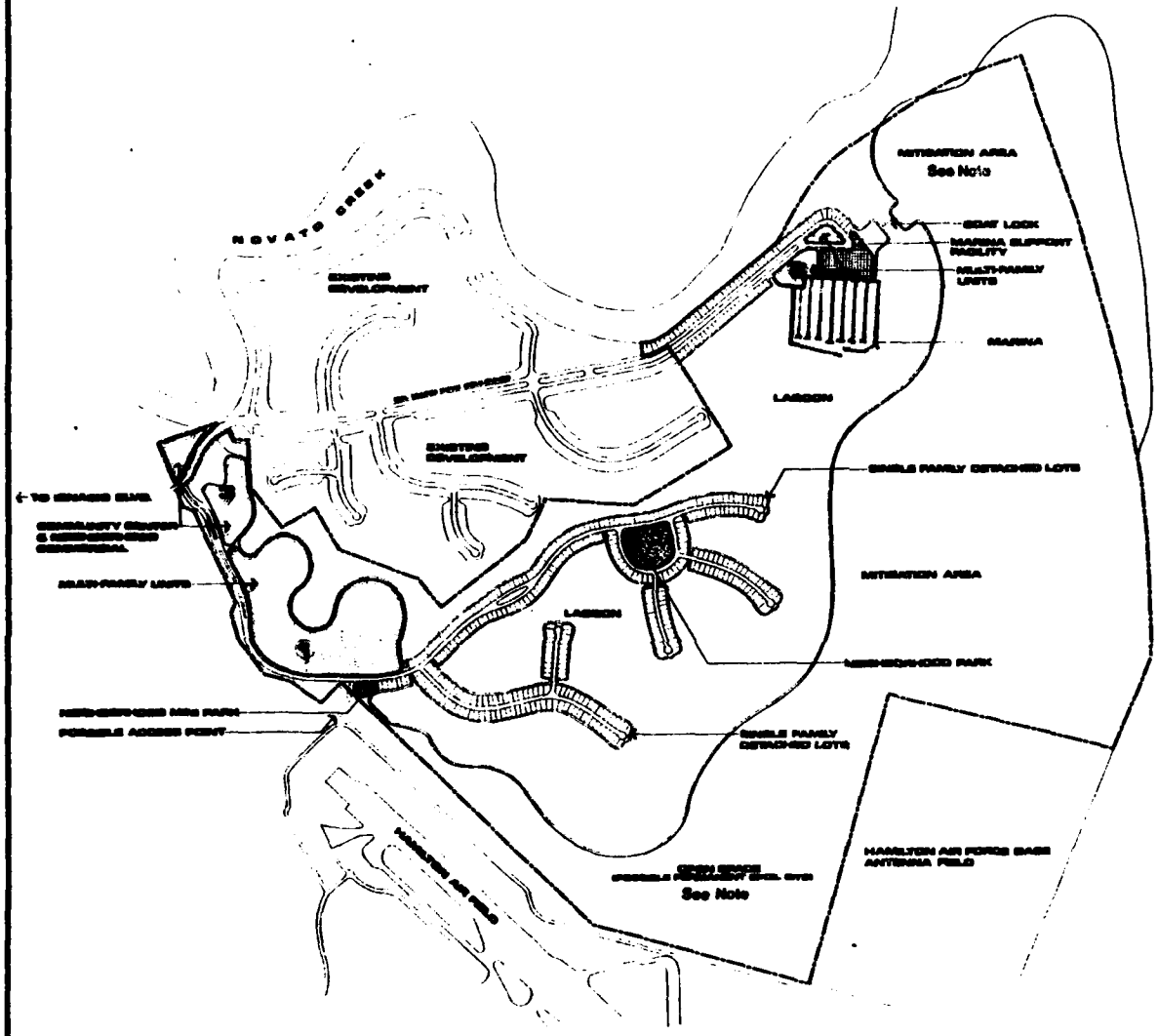
Home Savings and Loan proposes development of 1178 residential dwelling units, a community center site and a neighborhood commercial center. The project also includes a 602 berth marina and associated support facilities. Lagoons would comprise 546 acres of the site and would allow for individual dock facilities for future homeowners.

The elements included in the Unit 5 master plan are shown on the following page; the master plan is indicated on Exhibit B-1, and specific areas are indicated on Exhibits B-2 through B-4.

ALTERNATIVE A - PLAN ELEMENTS

		# Dwelling Units (DU)	# Acres	DU/acre
1.	Commercial marina with 602 berths	--	**18	--
2.	Marina support facilities including chandlery, fuel dock, boat sales, ramp, hoist, restaurant, parking	--	8	--
3.	Multi-family housing (One- and Two-story buildings)			
	a. Area 1			
	Townhouses	296		
	Condominiums	260 } 680	56.2	12.1
	Inclusionary/Senior Citizen*	124		
	b. Area 2			
	Condominiums	56 } 72	6.5	11.1
	Townhouse	16		
4.	Single family housing	426	95	4.5
5.	Neighborhood park	--	4.8	--
6.	Mini park	--	1.0	--
7.	Community Center Site & Commercial Area	--	17.5	--
8.	Lagoons and Waterways (includes Marina area) with a lock for deep water access to San Francisco/San Pablo Bays	--	546	--
9.	Mitigation/Open Space	--	875	--
	TOTAL	1178 units	1610 acres	.7 DU/acre

*According to Marin County's Inclusionary Zoning Ordinance, 10% of all units built in a project must be for low and moderate income housing.
**Marina acreage is actually included in the "Lagoons and Waterways" acreage.



1"= 2000'

SITE SUMMARY

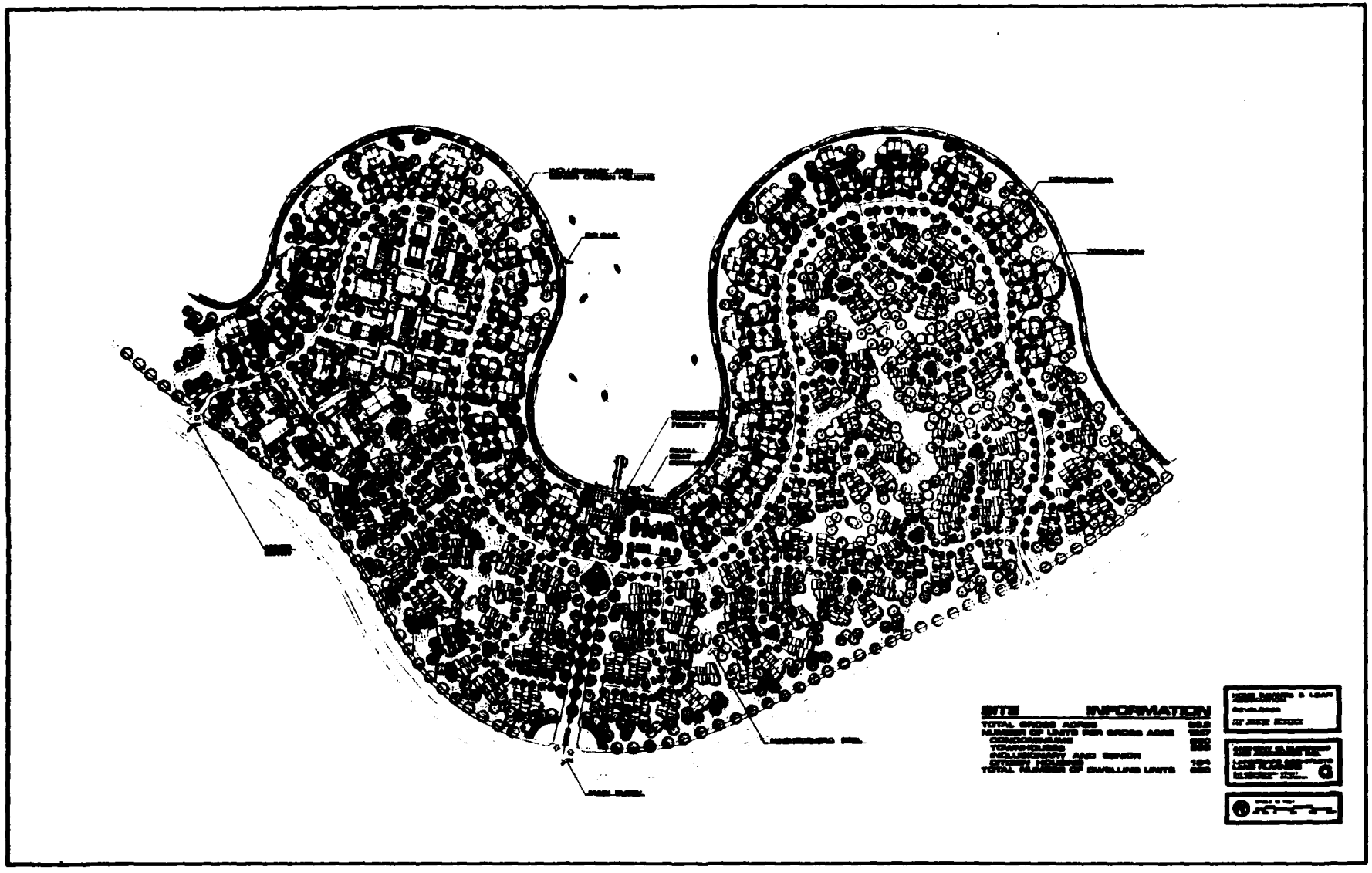
DESCRIPTION	
TOTAL NO. OF GROSS ACRES	
TOTAL NO. OF ACRES IN MITIGATION AREA	
TOTAL NO. OF ACRES IN DEVELOPED AREA	
NO. OF ACRES IN LAGOON	
NO. OF ACRES IN LAND AREA	
TOTAL NO. OF DWELLING UNITS	
NO. OF SINGLE FAMILY DETACHED LOTS	
NO. OF MULTI-FAMILY UNITS	
AREA	
AREA	
MARINA SUPPORT FACILITIES	
COMMUNITY CENTER AND NEIGHBORHOOD COMMERCIAL	
AREA	
NEIGHBORHOOD AND MINI PARKS	
MARINA INCLUDED IN LAGOON FIGURE	

NOTE

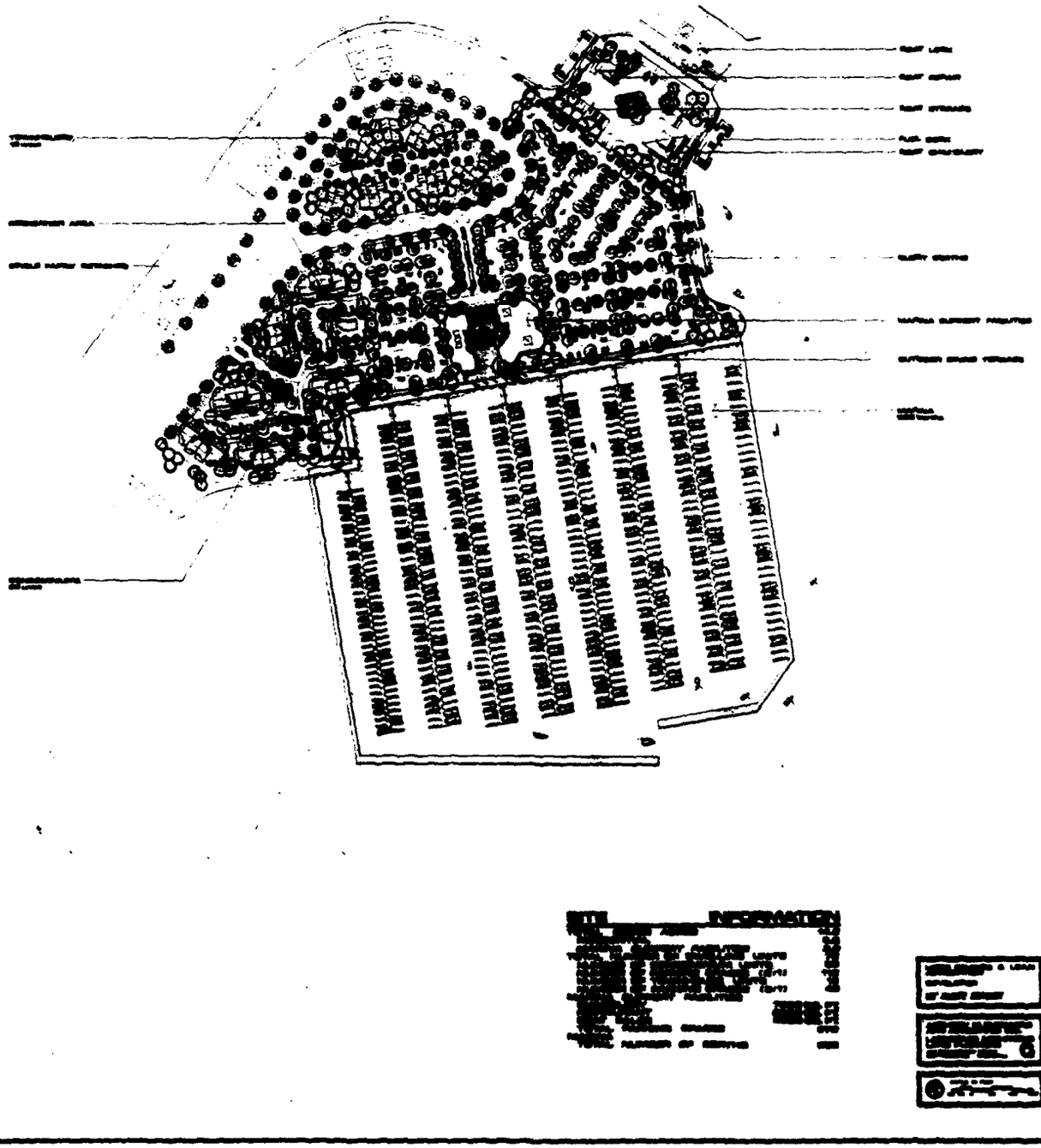
For Alternative A, the open space/ mitigation area would be used to mitigate habitat losses by increasing the habitate value of this area.

For Alternative C, the open space/ mitigation area would remain available for agricultural use and off-site mitigation would compensate for habitate losses.

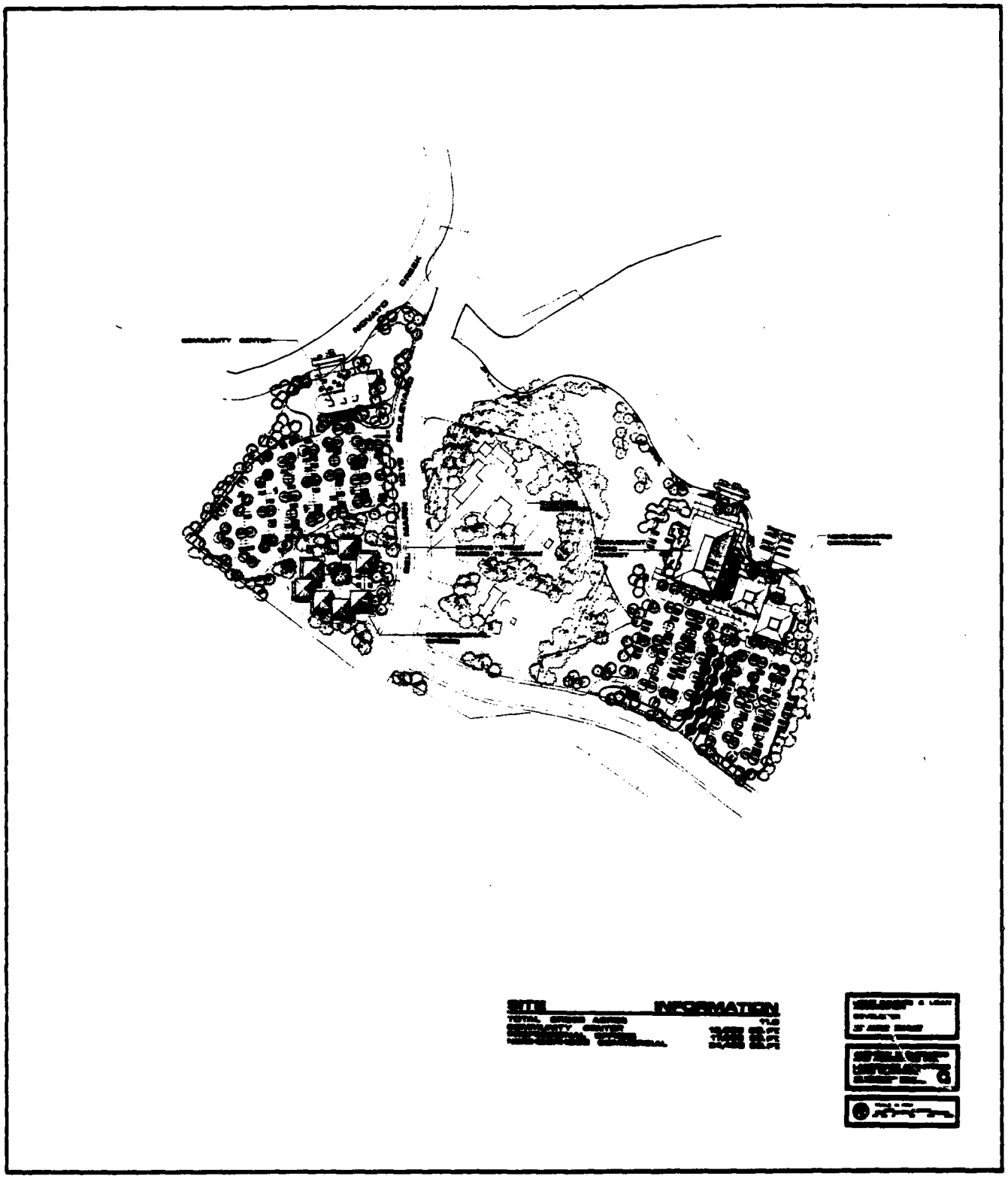
TORREY & TORREY INC. environmental/urban planning and design	Alternatives A & C - Master Plan	EXHIBIT B1



TORREY & TORREY INC. environmental/urban planning and design	Alternatives A & C Site Plan–Area 1	EXHIBIT B2



TORREY & TORREY INC. environmental/urban planning and design	Alternatives A & C Site Plan–Area 2	EXHIBIT B3



TORREY & TORREY INC. environmental/urban planning and design	Alternatives A & C Site Plan–Area 3	EXHIBIT B4

The project would involve excavating approximately 9,000,000 cubic yards of earth from the site to form the lagoon areas and to create fill material for residential and commercial building pads and streets. A levee would be constructed around the project between the lagoon and mitigation parcel, and a navigational lock would be constructed to allow deep water access to San Pablo Bay via Novato Creek. Boat docks are proposed behind each single family lot and multiple or ganged docks are planned in the multi-family area (Area #1 on the Master Plan).

Lagoon areas would comprise 546 acres of the site (including the marina). In general, lagoons would be 13 feet deep with 4:1 side slopes. In the marina area the lagoon would be 27 feet deep. The lagoons would be locked with Novato Creek near the marina for regulation of flow and boat access. Through-passage of water would be provided to flush the lagoons. In addition, flood overflows from Novato Creek would be retained within the lagoons for safe discharge after the floodwaters subside. The deep lagoon at the marina would provide for relatively long-term accumulation of sediments, with ultimate sediment disposal sites reserved in the designated open space areas. The developer estimates that a minimum of 56,000 cubic yards to a maximum of 231,000 cubic yards of material will need to be dredged from the creek every seven years.

Two possible mitigation plans for the 875 acre mitigation area have been proposed by the developer to compensate for the loss of terrestrial and wetland habitat. The entire mitigation area would be deeded to a federal or state agency when enhancement construction is completed for either of the two plans.

Mitigation Alternative A-1*

This mitigation alternative provides for the restoration of 236 acres of diked agricultural fields (historic tidelands) to wetland habitat. The restoration would establish an area of about 154 acres for the disposal of dredged materials; and, in a series of steps, a salt marsh would be established on this material over a period of 50 years. About 50 acres of fresh water ponds would be excavated immediately, and another 32 acres would be maintained as a seasonally flooded field.

In addition, a permanent dredged materials site, from which material may be removed at required intervals, is also proposed within the mitigation area. The exact size or location of this site has not yet been determined.

---

*A more detailed description of this alternative is included in the "Habitat Analysis and Mitigation Plan for the Proposed Bel Marin Keys Residential Development" prepared by Madrone Associates, April 27, 1981, in the Appendices Volume.

The remainder of the mitigation area would be preserved as open space and ruderal fields providing habitat for terrestrial species. A summary of the components of the entire 875 acre mitigation area is as follows:

		Acres
a.	50-year dredged materials site (converted to salt marsh)	154
b.	Seasonally flooded field	32
c.	Fresh water ponds	50
d.	Open space/ruderal fields and permanent dredged materials site	639
	TOTAL ACRES	875

Mitigation Alternative A-2*

This mitigation alternative also proposes a 50-year dredged materials site of about 154 acres which would eventually be converted to a salt marsh. An additional 671 acres of diked land would be restored to tidal action by breaching the dike on the bay side. The tidal action would cause siltation and an increase in elevation allowing marsh vegetation to become established in about 10 to 20 years.

The remainder of the mitigation area, about 50 acres, would be preserved as open space and ruderal fields and may be considered as a permanent site for dredged materials. A summary of the components of this alternative are as follows:

		Acres
a.	50-year dredged materials site (converted to salt marsh)	154
b.	Diked area restored to tidal action and eventual salt marsh	671
c.	Open space/ruderal fields and possible permanent dredged materials site	50
	TOTAL ACRES	875

*A detailed description of this mitigation alternative is included in "Addendum to the Habitat Analysis and Mitigation Plan for the Proposed Bel Marin Keys Residential Development: Revised Restoration Plan" prepared for Home Savings and Loan by Madrone Associates, September 10, 1982, in the Appendices Volume.

The total developed land, lagoon and mitigation open space areas are listed below as a percentage of the total project area of 1610 acres:

Developed land	12%	189 acres
Lagoon	34%	546 acres
Mitigation/Open Space	54%	875 acres
		1610 acres

ALTERNATIVE B - PROJECT AS PROPOSED BUT WITHOUT THE COMMERCIAL MARINA

The entire proposed development is included in this alternative with the exception of the commercial marina and the proposed support facilities (chandlery, fuel dock, boat sales, ramp/hoist, restaurant and parking). All other details of the proposed project remain unchanged.

ALTERNATIVE C - PROJECT AS PROPOSED BUT WITH OFF-SITE MITIGATION

The proposed development is unchanged in this alternative except that the area originally proposed for on-site mitigation in the project (875 acres) would remain in open space/agricultural use. An off-site mitigation area would be added to the project to compensate for loss of seasonal wetland habitat. At this time, no off-site mitigation areas have been identified and adequate off-site compensation has not been determined.

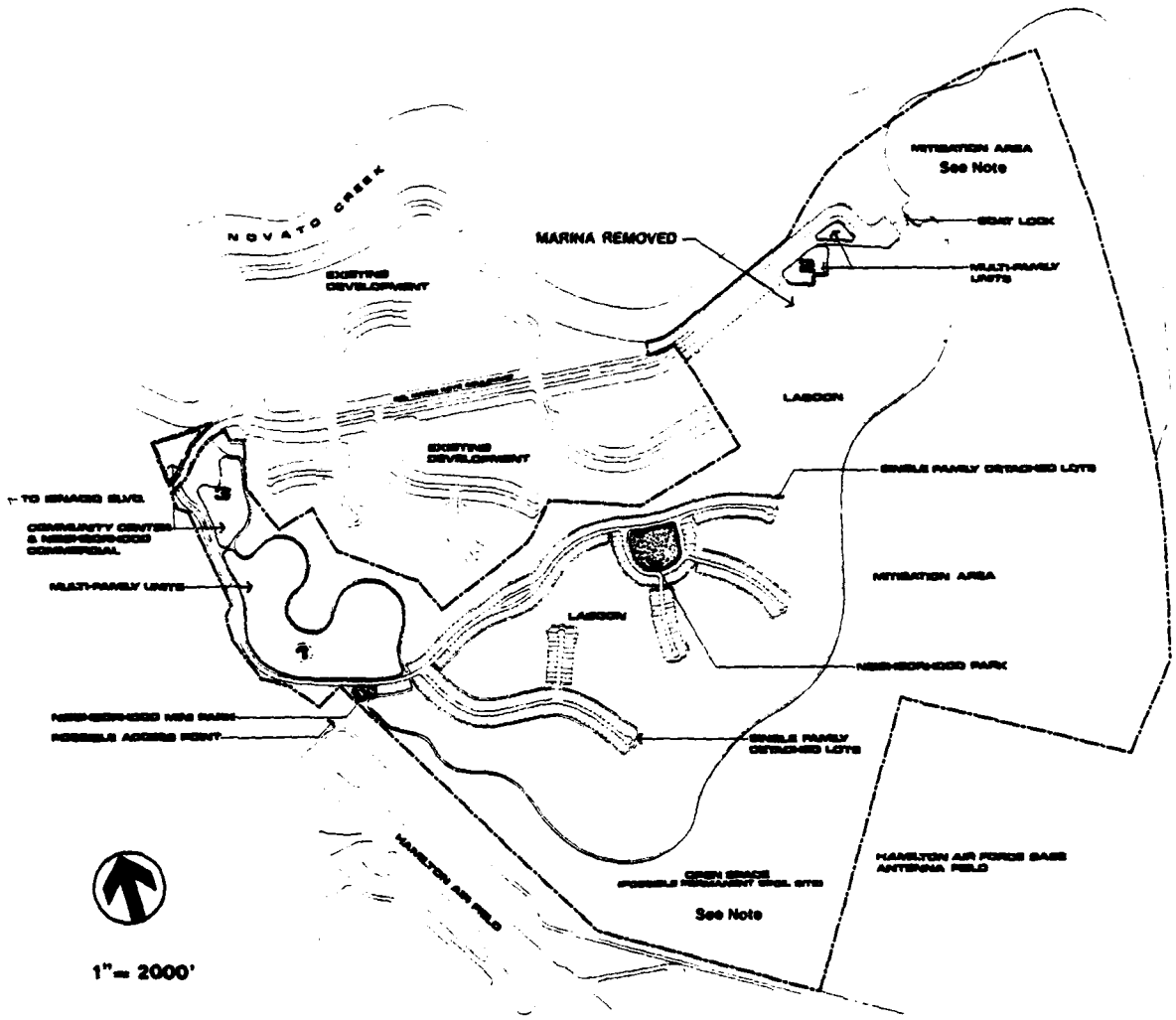
ALTERNATIVE D - REDUCED SCALE PROJECT WITH ON-SITE MITIGATION

This alternative reduces the number of single-family units with a corresponding increase in the number of multi-family units. The overall total number of units remains unchanged from the proposed project. The actual development area including the lagoon would be reduced in size, and multi-family housing would be constructed on 29.5 acres in the area designated for single-family housing in the proposed project. A schematic representation of the new boundary lines is shown on Exhibit B-6.

The total developed land area would be reduced by 49 acres, and the lagoon area would be reduced by 142 acres. The ratio between the overall developed land area and the total lagoon area remains unchanged from that of the proposed project.

		As Proposed		Alternatives D & E
$\frac{\text{Total developed land area (acres)}}{\text{Total lagoon area (acres)}}$	=	$\frac{189}{546}$	=	$\frac{140}{404}$

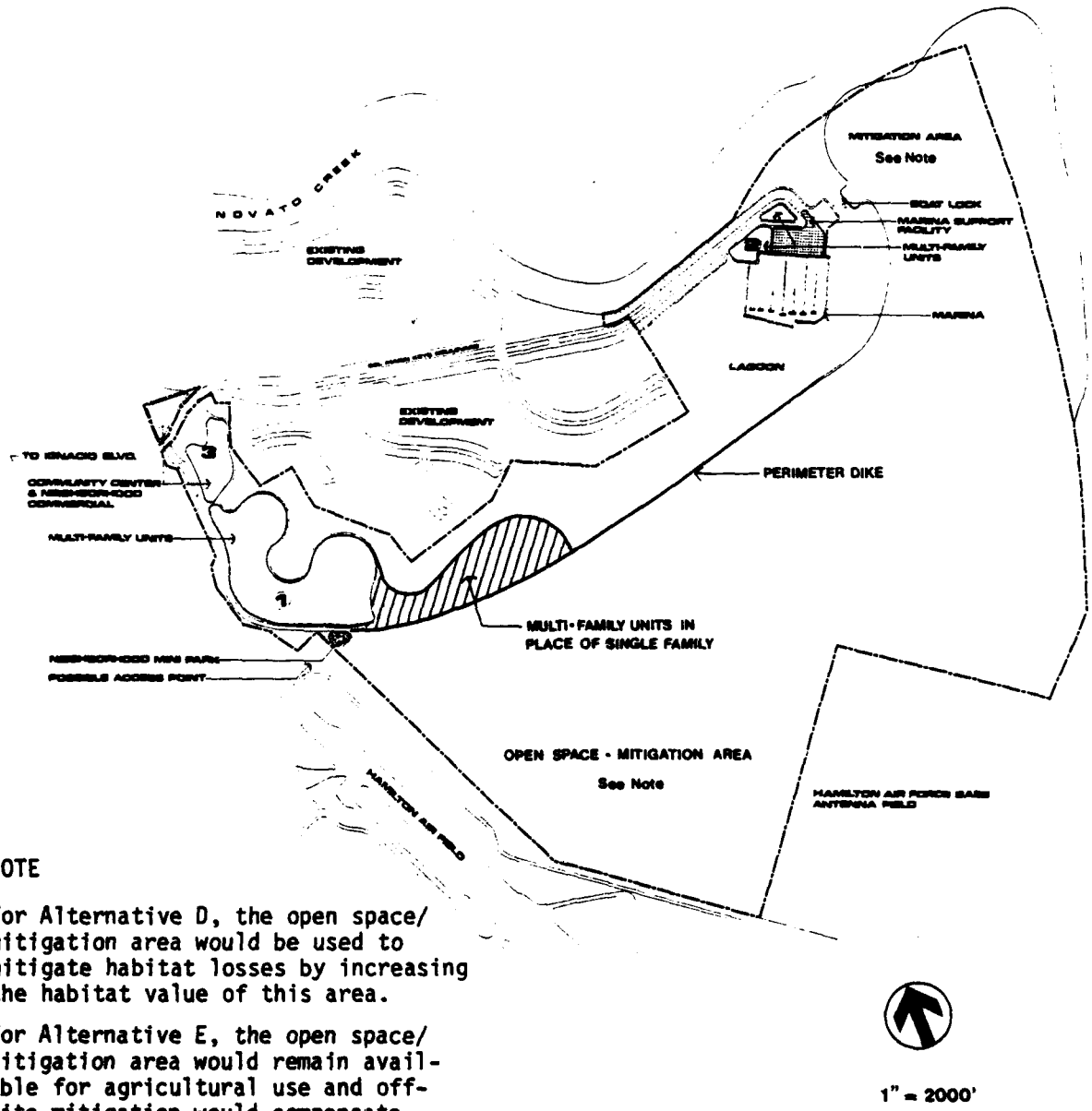
The 191 acres excluded from the development and lagoon would become part of the proposed mitigation area to be restored to tidal action and salt marsh habitat or preserved as open space.



NOTE

For Alternative B, the open space/ mitigation area would be used to mitigate habitat losses by increasing the habitat value of this area.

TORREY & TORREY INC. environmental/urban planning and design	Alternative B - Master Plan	EXHIBIT B5



NOTE

For Alternative D, the open space/ mitigation area would be used to mitigate habitat losses by increasing the habitat value of this area.

For Alternative E, the open space/ mitigation area would remain available for agricultural use and off-site mitigation would compensate for habitat losses.

TORREY & TORREY INC. 2T environmental/urban planning and design	Alternatives D & E – Master Plan	EXHIBIT B6

The plan elements of this alternative and of Alternative E are indicated on the following page.

ALTERNATIVE E - REDUCED SCALE PROJECT WITH OFF-SITE MITIGATION

This alternative is identical to Alternative D except that the 191 acres excluded from development as well as the 875 acre area originally designated for mitigation and open space, would remain in agricultural use. An off-site mitigation area would be identified to compensate for the loss of seasonal wetland habitat due to the excavation for the development and the lagoon.

ALTERNATIVE F - NO PROJECT

The no project alternative would mean that no new development would be undertaken on the site, and that the existing land uses would remain, namely agriculture and vacant land. This alternative is considered permit denial on the part of the Corps of Engineers.

ALTERNATIVES D AND E - PLAN ELEMENTS

		# Dwelling Units (DU)	# Acres	DU/acre
1.	Commercial marina with 602 berths	--	**18	--
2.	Marina support facilities including chandlery, fuel dock, boat sales, ramp, hoist, restaurant, parking	--	8	--
3.	Multi-family housing (One- and Two-story buildings)			
	a. Area 1			
	Townhouses	296		
	Condominiums	260 -680	56.2	12.1
	Inclusionary/Senior Citizen*	124		
	Additional Multifamily	352	29.5	11.9
	b. Area 2			
	Condominiums	56 -72	6.5	11.1
	Townhouse	16		
4.	Single family housing	74	16.5	4.5
5.	Neighborhood park	--	4.8	--
6.	Mini park	--	1.0	--
7.	Community Center Site & Commercial Area	--	17.5	--
8.	Lagoons and Waterways (includes Marina area) with a lock for deep water access to San Francisco/San Pablo Bays	--	404	--
9.	Mitigation/Open Space	--	1066	--
	TOTAL	1178 units	1610 acres	.7 DU/acre

*According to Marin County's Inclusionary Zoning Ordinance, 10% of all units built in a project must be for low and moderate income housing.
**Marina acreage is actually included in the "Lagoons and Waterways" acreage.

C. SUMMARY OF FINDINGS

The following section presents a summary of the environmental impacts with recommended mitigation measures for the proposed project and alternatives to the proposed project. It also includes a summary of impact conclusions as required by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

Conformance with NEPA is required due to the Federal permitting activity of the U. S. Army, Corps of Engineers. The Army's authority over the proposed project is based upon Section 10 of the River and Harbor Act (RHA) of 1899 (33 U.S.C. Section 403) and upon Section 404 of the Clean Water Act (CWA) (33 U.S.C. Section 1344) which pertains to the discharge of dredged or fill material into the waters of the United States. In Leslie Salt Co. vs. Froehlke 578 F 2d 742, 753 (9th Cir. 1978), the court held that the Corps' jurisdiction under the RHA extends to all lands 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 of the RHA of 1899 regulates any work or structure placed within its jurisdiction.

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 into the waters of the United States, including wetlands adjacent or contiguous to waters of the U.S.

Purpose and Need for the Project

The purpose of the proposed project is to provide additional housing opportunities within Marin County. The completion of 1178 dwelling units as part of this proposed project would reduce the housing shortage in an area where the amount of land available for residential use is limited.

Summary of Beneficial Impacts

Alternatives A through E would have the following beneficial impacts:

1. Additional housing units would reduce housing shortage in Marin County.

2. Lagoon areas would provide detention storage for Novato Creek waters during a flood.

3. The existing Novato Creek habitat between the proposed navigational lock and San Pablo Bay would be preserved.

4. 124 inclusionary housing units would be provided in Marin County.

Summary of Adverse Impacts and Recommended Mitigations. The following table presents a summary of the environmental impacts which would be associated with the proposed project (Alternative A) and/or the project Alternatives B through E and the recommended mitigations. For detailed discussions of these impacts and mitigation measures, please refer to the appropriate sections of the text following this chapter. The letters in parentheses after each recommended mitigation indicate who would have responsibility for implementing the mitigation. The letters are keyed to the following code:

DR:	Developer Responsibility
CR:	County Responsibility
JCDR:	Joint County and Developer Responsibility
BMK CSD:	Bel Marin Keys Community Services District Responsibility

Significant Adverse Impacts and Mitigations

Adverse Impacts	Alternative(s)	Recommended Mitigation
Land Use		
• Incompatible land use with existing flight operations at Hamilton AFB	A through E	• Relocate or remove dwelling units proposed in the runway approach zone (DR)
• Conflicts between four-lane access road and wildlife habitat west of site as well as with force main sewer easement	A through E	• Move roadway alignment to eastern side of sewer easement and revegetate buffer strip to screen wildlife area (DR)
• Conflict with 100-foot Stream Conservation Zone and Zoning Ordinance restricting uses along Novato Creek	A through E	• Remove or relocate units away from creek to preserve 100-foot Conservation Zone at edge of stream bank (DR)
• Bicycle path plan not delineated	A through E	• Provide bicycle lane on Bel Marin Keys Boulevard and bicycle parking facilities throughout development (DR)
• Proposed density of multi-family inconsistent with S-1 zoning	A through E	• Remove medium density residential units from S-1 zone (DR)
• Public access to Novato Creek and San Pablo Bay not delineated	A through E	• Provide pedestrian/bicycle trails on existing and proposed levees (DR)
Public Service and Fiscal Considerations		
• Response times beyond the Novato Fire Protection District's five-minute standard	A through E	• Install sprinklers in all structures located beyond the district's response time (DR); or construct a new fire station closer to Bel Marin Keys (Novato FPD)
• Marina would create special firefighting problems, necessitating additional personnel if a new fire station is not built.	A, C, D, E	• If a new station is not built closer to Bel Marin Keys, hire additional firefighters for Station 4 (Novato FPD)

Adverse Impacts	Alternative(s)	Recommended Mitigation
• Additional treatment facilities of Novato Sanitary District required to accommodate portion of Unit 5 and other future development	A through E	• Expand Ignacio treatment plant using connection fees paid from Unit 5 and other development in area (Novato Sanitary District)
• Additional students in grades K-12 possibly exceeding capacity at some schools	A through E	• Adjust school attendance areas to use excess capacity at other schools (Novato Unified School District)
• With BMK incorporated city would receive less revenue from Unit 5 than costs required to provide services	A through E	• Negotiate with County for portion of increased property tax revenues; institute special taxes or assessments (BMK CSD)
• Under certain alternatives, CSD would receive less revenue from Unit 5 than costs required to provide services	B (If BMK incorporates); A through E (If BMK remains unincorporated)	• Institute special assessments to finance services (BMK CSD)
• Revenues to CSD from Unit 5 would be insufficient to construct public parks	A through E	• Institute special assessments to finance parks (BMK CSD); require developer to finance parks (DR)
• Proposed park acreage is less than area required by County	A through E	• Permit lagoons and mitigation area to satisfy requirements for additional park acreage (CR); construct parks in lieu of providing additional park acreage (DR)
• Additional service expenditures for street lighting, park maintenance, lock maintenance, dredging on BMK Community Services District	A through E	• Institute special assessments to finance services, maintenance and parks (BMK CSD)

Adverse Impacts	Alternative(s)	Recommended Mitigation
Traffic and Circulation		
• Insufficient capacity of Ignacio/Southbound 101 on/off ramps in intersection	A through E	• Widen southbound on-ramp to two lanes and southbound off-ramp to three lanes; provide channelized turn lanes and provide road connection between Bel Marin Keys Boulevard and Highway 37 (CalTrans & DR)
• Insufficient capacity of Nave Drive/ Highway 101 Northbound off-ramp	A through E	• Widen Nave Drive to three lanes between off-ramp and Bel Marin Keys Boulevard (CalTrans & DR)
• Insufficient capacity at Nave Drive/Bel Marin Keys Boulevard intersection	A through E	• Widen northbound Nave Drive approach to Bel Marin Keys Boulevard to four lanes (two exclusive left-turn, one exclusive right-turn, two through lanes) (CalTrans & DR)
• Insufficient capacity of Bel Marin Keys Boulevard between BMK development and Hamilton Drive	A through E	• Widen to four lanes and add bike lanes on shoulder (DR)
• Hazardous condition of main entry to Area 1 and possibly Areas 2 and 3	A through E	• Move entry away from inside of major roadway curve or straighten Bel Marin Keys Boulevard; provide left and right turn lanes for access to Areas 1, 2, 3 (DR)
• Potentially hazardous conditions of parked cars along arterials serving Areas 1, 2, 3	A through E	• Prohibit on-street parking along arterials, provide sidewalks on all streets (CR)
Air Quality		
• Potential short-term air degradation due to construction activities	A through E	• Apply water to exposed earth surfaces to suppress dust, if necessary (DR)

Adverse Impacts	Alternative(s)	Recommended Mitigation
• Regional and local air quality reduction due to traffic (cumulative impact)	A through E	• Improve and encourage transit access, carpool/vanpool programs, bicycle use (JCDR)
Noise		
• Incompatibility of residential use with continued aviation use at Hamilton AFB	A through E	• Design all units so that interior CNEL does not exceed 45 dB (DR); ensure that airport activity will not result in exposure of homes to CNEL of 65 dB in accordance with state law (CR); make prospective purchasers aware of potential noise impacts (JCDR)
• Short-term increase in noise from construction	A through E	• Locate construction haul routes a minimum of 500 feet from existing homes where possible (DR)
Hydrology, Water Quality, Sedimentation		
• High potential for reduced water quality in proposed lagoons	A through E	• Develop a detailed operation and maintenance plan to keep water quality at an acceptable level (see page I-5 for specific element) (DR)
• High potential for erosion and sedimentation in lagoon area	A through E	• Prepare erosion and sediment control plan, and operating guidelines for the lock and flushing system through lagoons (see page I-8 for specific elements) (DR)
• High potential for uncontrolled deposition of dredge materials resulting in a degraded environment	A, B, D	• Prepare detailed plans on engineering aspects of cell design and operation (see page I-9 for specific elements) (DR)
• High potential for off-site degradation of water quality due to dredge materials deposition	C, E	• Submit off-site sediment disposal plans (DR).

Adverse Impacts	Alternative(s)	Recommended Mitigation
Geology and Seismicity		
• High potential for differential settlement and slope instability on filled areas	A through E	• Prepare detailed geotechnical engineering study; design to allow for differential settlement; test Bay Mud samples for evaluating slope stability (specific recommendations on pages J-4 through J-6) (DR)
• High potential for deformation of lagoon bank slopes during an earthquake	A through E	• Prepare detailed geotechnical evaluation to determine safe setback for buildings from lagoon slopes (DR)
• Unknown liquefaction potential on the site	A through E	• Make sufficient borings to determine if continuous sand layers are present in order to evaluate liquefaction potential (DR)
Soils and Agriculture		
• Removal of 1400 acres from agriculture; 1% reduction in total agricultural land in Marin; 26% reduction in total hay, grain and silage acreage	A, B, D	• Unavoidable adverse impacts
• Removal of 735 acres from agriculture; 0.4% reduction in total agriculture land in Marin; 10% reduction in total hay, grain and silage acreage	C	• Unavoidable cumulative adverse impacts; use of sewage effluent on preserved 875 acres could mitigate loss of hay, grain or silage yields
• Removal of 544 acres from agriculture; 0.3% reduction in total agricultural land in Marin; 7% reduction in total hay, grain and silage acreage	E	• Unavoidable cumulative adverse impacts; use of sewage effluent on preserved 1066 acres and long-term leases could mitigate loss of hay, grain or silage yields

Adverse Impacts	Alternative(s)	Recommended Mitigation
Vegetation and Wildlife		
• Loss of seasonal and year-round wetland habitat and wetlands restoration potential due to development	A through E	• Revise proposed mitigation plan based upon a consensus of DFG, USFWS, and Marin County for adequacy of compensation (JCDR)
• High potential for conflict between wildlife preserve area west of creek and proposed access road	A through E	• Relocate 4-lane roadway farther to east; provide vegetation visual screen for wildlife area (DR)
• Inconsistency of single family homes along Novato creek with the Stream and Creekside Conservation Zone for wildlife and habitat preservation (see land use, above, also)	A through E	• Relocate or set back single-family homes 100 feet from southern bank of Novato Creek (JCDR)
• Adequate off-site compensation for eliminated habitat not yet determined	C, E	• Select site and provide adequate compensation based on criteria established in conjunction with Marin County, Department of Fish and Game and U.S. Fish and Wildlife Service (JCDR)
Archaeology		
• Low potential for archaeological remains on site	A through E	• Consult with qualified archaeologist if archaeological resources are encountered during excavation (DR)
Aesthetics		
• Intrusion of development into open agricultural/shoreline views	A through E	• Provide public access to creek and shoreline along existing dikes (specific recommendations on pages N-2 and N-3) (DR)

Adverse Impacts	Alternative(s)	Recommended Mitigation
• Possible aesthetic intrusion of boats and RVs parked in front yards and on the street	A through E	• Provide secure storage areas for RVs and boats (specific recommendations on page N-3) (DR)
<u>Energy</u>		
• Cumulative demand for energy to meet heating, cooling, lighting and transportation needs	A through E	• Provide energy conservation measures as indicated on page O-2

Unavoidable Adverse Impacts

The following impacts are considered to be unavoidable adverse impacts which cannot be completely mitigated.

Land Use

- Incompatible residential land use with existing (and possibly future) flight operations at Hamilton AFB due to noise and safety considerations. (Until the plans for future flight operations at Hamilton AFB are finalized, specific long-term implications of locating a residential-commercial development adjacent to the runway cannot be determined.) (Alternatives A through E)

Air Quality

- Regional and local reduction in air quality due primarily to automobile emissions (significant only as a cumulative impact). (Alternatives A through E)

Soils and Agriculture

- Removal of 1,410 acres from agricultural production (hay, grain, silage) which is 1% of the total agricultural land in Marin and 26% of the total hay, grain and silage acreage. (Alternatives A, B, D)

- Removal of 735 acres from agricultural production (hay, grain and silage) which is 0.4% of the total agricultural land in Marin and 10% of the total hay, grain and silage acreage. (Alternative C)

- Removal of 544 acres from agricultural production (hay, grain, silage) which is 0.3% of the total agricultural land in Marin and 7% of the total hay, grain and silage acreage. (Alternative E)

Vegetation and Wildlife

- Loss of existing seasonal and year-round wetland habitat and wetlands restoration potential due to the proposed development. (Alternatives A through E)

Energy

- Cumulative demand for energy to meet heating, cooling, lighting, transportation and other energy needs. (Alternatives A through E)

The Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

Land Use

- Specific long-term implications of locating a residential-commercial development adjacent to Hamilton AFB cannot be determined until future plans for Hamilton are finalized. However, for Alternatives A through E, the construction of residential units near the runway could place severe constraints on flight operations because of public concerns regarding safety and noise. This would decrease long-term possibilities for flight operations at Hamilton.

Air Quality

- Alternatives A through E would produce minor long-term increases in community carbon monoxide levels caused by increased traffic.

Soils and Agriculture

- Alternatives A, B, D would result in an annual decrease in oat hay production on the site of about 26% of the counties total yield of hay, grain and silage. This loss of long-term productivity is an unavoidable impact.

- Alternatives C and E would result in a decrease in hay, grain and silage production that would be significant as cumulative impact for county agricultural production.

Vegetation and Wildlife

- Alternatives A, B, C would eliminate the long-term salt marsh restoration potential of 735 acres of diked agricultural land within the historic marsh margin of San Francisco Bay due to construction of the lagoons and developed areas.

- Alternatives D, E would eliminate the long-term salt marsh restoration potential of 544 acres of diked agricultural land within the historic marsh margin of San Francisco Bay due to construction of the lagoons and developed areas.

- Alternatives A, B, D would not have complete salt marsh restoration for the site for 50 years due to the continued placement of dredged materials, according to the mitigation plan.

Energy

- Alternatives A through E would have long-term commitments of energy resources to provide for the local population increase

Irreversible and Irretrievable Commitments of Resources Which Would be Involved in the Proposed Action Should it be Implemented

The following commitments of resources would be involved in implementing the proposed project or alternatives.

- Elimination of agricultural land in favor of residential use (estimated acreages for each alternative given under Unavoidable Adverse Impacts)
- Use of building materials and energy during project construction and maintenance (Alternatives A through E)
- Consumption of energy, water and services during project operation (Alternatives A through E)
- Elimination of salt marsh restoration potential (estimated acreages for each alternative are given under the Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity)
- Possible reduction in options for aviation use of Hamilton Air Force Base due to adjacent residential land use (Alternatives A through E)

Growth Inducing Impacts

The proposed project and alternatives have many characteristics which may be considered growth inducing. The addition of 1178 dwelling units to Marin County with the accompanying population increase would contribute to the need for goods and services in the area. Alternatives A through E would stimulate growth of additional (off-site) commercial centers to provide for the population increase, require expansion of public services and utilities, and require construction and improvement of roadways. Increased capacities may then be considered growth inducing. Development of the porject would also result in increase in revenues to the County. For a detailed discussion of revenue distribution please see Section E. Public Service and Fiscal Implications. In addition, implementation of any of the Alternatives A through E would continue the precedent set (Bel Marin Keys 1-4) which permits residential development on diked agricultural land within the historic marsh margin of San Francisco Bay. This could contribute to further development demand for surrounding diked lands in the Novato plain.

The population increase would help to generate some additional employment opportunities in Marin and nearby communities. The increase in housing availability would therefore contribute to economic growth in the subregion.

D. LAND USE

1. Existing Land Uses

Setting

Approximately 1400 acres of the 1610 acre site are currently utilized for agricultural production; oat hay is the site's major crop. Two residences are located at the western edge of the site. Several utility easements traverse the property (see Exhibit D-1). A 40-foot wide PG&E tower easement extends into the site from Bel Marin Keys Boulevard and runs several thousand feet northeasterly before turning north and crossing Novato Creek. A 20-foot wide Sanitary District easement parallels the property line at the western side of the site, where the property borders Flood Control land and the air field. A 10 and a 20-foot cable easement intersect on the site, just south of the existing Bel Marin Keys development.

Hamilton Air Force Base is located to the south of the property. The base includes an antenna field which borders the site's southeast corner and an air field which parallels a portion of the southern property line. Current flight activity at the air field ranges from approximately 240 to 300 operations per day.[1] Future plans for Hamilton Air Force Base are unclear at this time, but include the options of converting the base to a general aviation airport[2] or developing it with a broad range of uses such as office, commercial, residential and light industrial.[3]

To the north of the site and Novato Creek lie County Flood Control property and an an Air Force antenna field. Also on the north side of the project site is the existing Bel Marin Keys residential development which includes some 500 units with another 187 units presently under construction. A wildlife habitat owned by the Marin County Flood Control and Water Conservation District borders the site on the west.

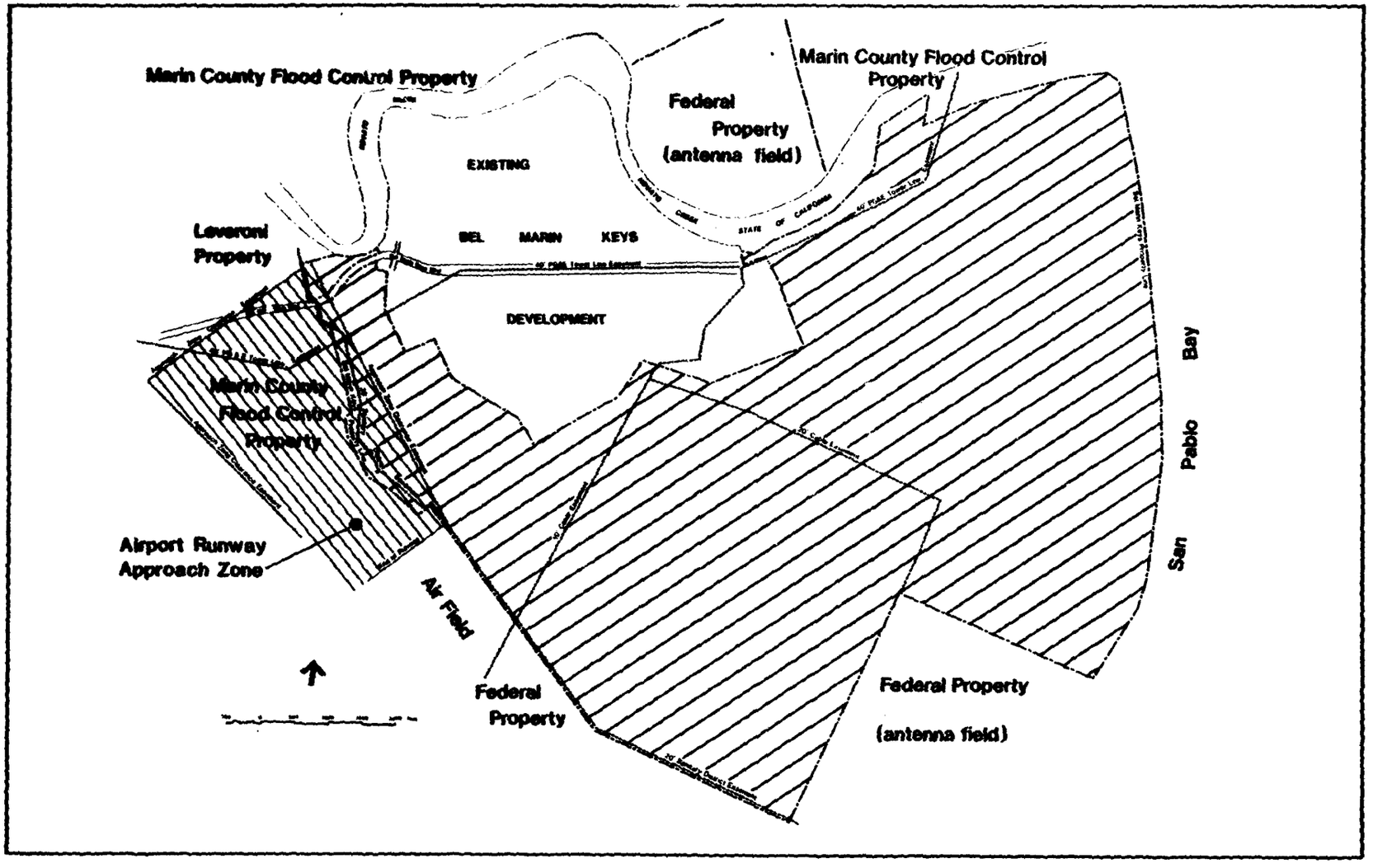
Impacts - Existing Land Uses (Alternatives A through E)

On-Site. The impacts of displacing agricultural land are discussed in Section K of the report.

One of the existing residences would be demolished, but the larger residence would remain. A proposed road would be constructed along a portion of the Sanitary District easement on top of an existing concrete pipe. The proposed road construction would necessitate placing fill over the pipe. This could result in damaging the pipe and/or making future repair and maintenance work extremely difficult.[4] This is considered to be an adverse but not significant impact.

Surrounding Uses. The proposed development would be highly compatible with the existing Bel Marin Keys development.

A potential land use conflict would be the proximity of some of the proposed units to the air field. These impacts are discussed in terms of noise (Section H) and safety (Section D - Zoning, S-1 District) and are considered to be significant adverse impacts.



TORREY & TORREY INC. 2T environmental/urban planning and design	Easements on Site and Adjacent Ownership	EXHIBIT D1

Another potential conflict exists between proposed uses at the site and the adjacent existing wildlife habitat to the west. A road with a landscaped median would separate multi-family units from the wildlife area. Vehicular traffic, human activity, and domestic pets could detract from the quality of the wildlife habitat if it were not properly buffered.

Mitigation Measures - Existing Land Use (Developer Responsibility)

For Alternatives A through E, portions of the development which would be subjected to noise or safety hazards from air field activity should be removed or relocated on the site. If and when it is determined that the air field will no longer be operative, these areas could be developed as a second phase of the project.

For Alternatives A through E, the proposed road which would separate areas 1 and 3 from the wildlife habitat should be moved further onto the site (to the east). It should not be located directly on the Sanitary District easement. Moving the road further to the east would establish more of a (landscaped) buffer between the proposed development and the wildlife habitat.

2. Legal, Policy, and Institutional Constraints - Local, State, Federal

Marin Countywide Plan

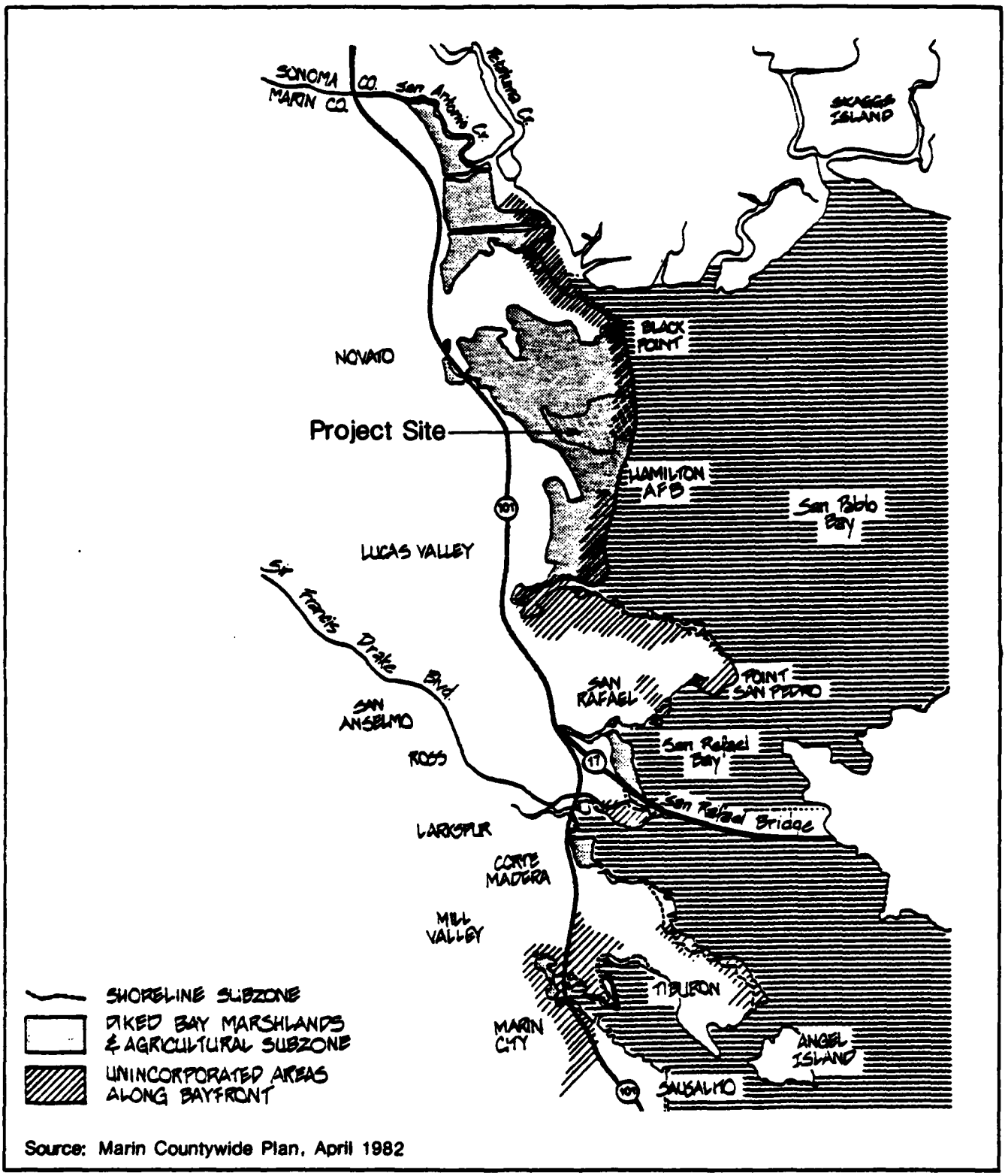
Bayfront Conservation Zone. The Marin Countywide Plan was amended in July, 1981, to include the designation of a Bayfront Conservation Zone. The project site falls entirely within this zone (see Exhibit D-2).

The zone has been divided into subzones, and the Bel Marin Keys 5 site is within the Diked Bay Marshlands and Agricultural Subzone, which include all historic bay marshlands. The purpose of this zone is to define areas which can foster the continuation of agriculture, or to consider the feasibility of returning undeveloped unfilled and diked areas to a former wildlife habitat by restoration. This subzone includes a 100-foot band landward on undeveloped lands. Thus a buffer zone area is intended to be provided between development and identified or potential wetlands.

The policies which have special relevance to the project at hand are the following (underlined by authors of this report):

1. Public Benefits:

"...land uses which do require diking, filling, or dredging and/or are less protective of habitat value may be permitted when it can be proven that (a) there are no significant upland portions of the property (not requiring diking, filling, or dredging) available for development and (b) that the resulting public benefit exceeds environmental costs and liabilities. Public benefits to be provided in the diked portions of the Bayfront Conservation Zone shall include but not be limited to: public access and recreational opportunities, educational or scientific



Source: Marin Countywide Plan, April 1982

TORREY & TORREY INC. 2T environmental/urban planning and design	Marin Countywide Plan Bayfront Conservation Zones	EXHIBIT D 2

opportunities, provision of housing (particularly housing developments which include low and moderate income housing), provision of essential water conveyance, transportation or utility services, and protection from flood or other natural hazards. On parcels greater than one-half acre in size, mitigation and/or compensation for habitat value lost due to diking, filling, or dredging shall be required from the applicant/developer, the amount to be determined by the county in conjunction with federal and state agencies."

2. Habitat Protection:

"Development should not encroach into sensitive wildlife habitats, limit normal range areas, create barriers which cut off access to food, water, or shelter, or cause damage to fisheries or fish habitats. Buffer zones between development and identified or potential wetland areas shoud be provided. Access to environmentally sensitive marshland and adjacent habitat should be restricted, especially during spawning and nesting seasons."

3. Agriculture:

"The County shall protect existing agricultural lands in the Bayfront Conservation Zones. These lands are an important resource for the County: they are a visual and scenic resource; they play an integral role in other agricultural and dairy operations in Marin County; they are a productive economic resource; and they are compatible with water-related wildlife habitat. Such agricultural activities could consist primarily of grazing operations harmonious with adjoining marshes, wetlands, grasslands, or other sensitive lands."

4. Public Access:

"The County shall ensure that public access is provided and protected along the bayfront and significant waterways. The County views public access easements, gained through offers of dedication, as a condition of development plan approval, as the primary means available to increase public access opportunities."

5. Aesthetic Quality:

"The County shall protect visual access to the bayfront and scenic vistas of water and distinct shorelines through its land use and development review procedures. This viewshed protection is essential for the preservation of Marin County and San Francisco Bay identity, for the enhancement of aesthetic qualities, and for visual and psychological relief from adjacent urban environments."

The impacts of the proposed project with respect to the Bayfront Conservation Zone land use designation must be evaluated on the basis of criteria established by Marin County. Development is permitted in diked portions of the zone

provided that "the resulting public benefit exceeds environment cost liabilities."

Impacts including potential public benefits are discussed for the following issues:

- Habitat Protection, Section L - "Vegetation and Wildlife"
- Agricultural Land Protection, Section K - "Soils and Agriculture"
- Public Access, Section D - "Land Use" (BCDC)
- Aesthetic Quality, Section N - "Aesthetics"

Other public benefits associated with the project are the provision of housing, described in Section C and the Inclusionary Housing Study, and flood control measures, described in Section I, "Hydrology".

The project alternatives which include both wildlife habitat and agricultural land protection would be the most consistent with Marin County's land use goals and policies. These would be Alternatives C and E.

Stream and Creekside Conservation Zone. The Marin Countywide Plan was amended in April 1982 to include a policy on Stream and Creekside Conservation Zones. These zones consist of buffer strips along all streams.

Stream Conservation Areas have been designated which include the watercourse itself, surrounding banks and a strip of land extending laterally outward from the top of both banks. For large tracts of land in the City-Centered Corridor, the buffer strips should be 100 feet in width. Residences and certain other new uses are not permitted within the Stream Conservation Areas. Specific policies pertaining to the preservation of existing and native vegetation, fish and wildlife protection and enhancement, erosion control, use and aesthetics, management and flood control apply to all Stream Conservation Areas. (See Appendix I for a complete description of these policies.)

The proposed project would provide a buffer along Novato Creek in its proposed mitigation areas. For the rest of its length within the project site, single family housing and a navigational lock are proposed. Specific mitigations for alignment of the housing along the creek are proposed in Sections L and N. In terms of the Stream and Creekside Conservation Zone policy, the master plan would protect approximately 2/3 of the length of the creek by an undeveloped buffer. This is considered to be a beneficial impact.

Mitigation Alternatives - Marin Countywide Plan

- The County could approve the plan as proposed, with approximately 50 single family lots fronting on the creek, based on the merits of the project. These include provision of mitigation area and flood control improvements.

- The units which border the creek could be removed or relocated to another part of the site and a buffer strip would be provided between Novato creek and the Bel Marin Keys Boulevard extension.

Zoning - Title 22 of the Marin County Code

Currently, the project site is zoned RSP-0.5 according to Marin County Zoning. In addition to permitting one single detached dwelling unit per two acres, this zoning designation allows park, school and non-commercial recreational uses.[5]

The project application includes a request for the property to be rezoned from an RSP district to a Residential Multiple Planned Commercial (RMPC-0.73) district. Permitted uses under RMPC zoning include single and multiple dwellings, offices, public parks and commercial and institutional uses.[6] The intent of residential and planned districts is to allow development consisting of various types of housing to be designed without the confines of specific yard requirements. This type of site design permits greater flexibility for the provision of open space and encourages commercial areas in which density and development is controlled so that each project is compatible and harmonious with its environment.

The Zoning Code specifies design requirements for proposed construction in planned districts. Recommendations for site preparation include erosion control and creekside and watershed preservation measures. Building height is restricted to thirty feet and clustering of buildings is recommended.

Assuming a constant residential density of .7 units per acre, the density impact would be virtually the same for Alternatives A through E, with Alternative B having a lower commercial density. This would be an appropriate density under RMPC - 0.73 zoning. The proposed uses, which are the same for Alternatives A through E, would conform to those allowed in an RMPC district.

Detailed planning (including proposed elevations, sections, building design and floor plans) have not yet been completed for the proposed development. Therefore the project cannot be thoroughly evaluated in terms of the County's zoning design requirements. The project sponsor has stated that buildings would be two stories or less in height.[7] The extension of Bel Marin Keys Boulevard and proposed residential units located on the northern side of it would conflict with one of the ordinance's drainage requirements (Section 22.47.024) which states that "areas adjacent to creeks shall be kept as much as possible in their natural state." The site plan delineates approximately 50 single family lots which would line the southern bank of Novato Creek. Although a number of existing Bel Marin Keys units already border the creek, the proposed units would be in conflict with the Zoning Ordinance drainage restriction. Construction of lagoons along the creek would also have an affect on natural drainage patterns; impacts and recommended mitigation measures are discussed in Section I of the report.

S-1 District (Chapter 22.54) - A portion of the site is designated as an S-1 district (see Exhibit D-1). This zoning designation pertains to a current flight pattern easement for Hamilton Air Field. Uses in the S-1 are more restrictive than those allowed in the zoning district (RMPC) with which it is combined; residential density is limited to four units per acre and markets, theaters, schools and places of public assembly are prohibited.[8]

Building height is limited further than what is already specified by the RMPC zoning. "Building height shall be limited so that no part of a building projects above the sloping approach zone surface, described as a uniformly sloping surface which is zero feet in elevation along the line of the S-1 district nearest the runway and one hundred fifty feet in elevation along the line of the S-1 district farthest from the runway."[9]

Alternatives A through E are all inconsistent with the S-1 district.

A portion of the medium density units in Area 1 and some of the proposed offices in Area 3 would be constructed within the S-1 district. While this would not pose additional height restriction for the proposed development, there would be a maximum allowable density of four residential units per acre. The project master plan proposes 12 units per acre. This would be a significant adverse impact.

It should be noted that a change in operations of the air field could result in a reconfiguration of the S-1 zone. If, for example, flight activity were to continue only at the southern half of the field, the wedge-shaped S zone would shift several thousand feet to the south.

F-2 Secondary Floodway District (Chapter 22.95). The Secondary Floodway District provides for the temporary storage of floodwater. This district permits 25 percent of the land area to be filled with the remaining percentage available for water storage. The project site is within this district and is, therefore, subject to the restrictions on new development. All alternatives would be consistent with the restrictions as described in Section I, Hydrology of this report.

Mitigation Measures - Zoning

- Proposed single family lots which border the creek should be set back from the bank or relocated to another portion of the site.
- Building materials and colors should blend into the natural environment as much as possible.
- Building height should not exceed 30 feet.
- The proposed master plan should be redesigned so that construction of medium density residential development is not proposed within the S-1 zone. As recommended in Section N, "On Site Functional Relationships," the neighborhood park could be relocated within Area 1 and some medium density units could be constructed on the original park site.

Inclusionary Housing Ordinance (No. 2572)

Marin County's Inclusionary Housing Ordinance stipulates that any development involving fifteen or more parcels or dwelling units must provide 10 percent of the total number of dwelling units as inclusionary units. These are to be affordable by moderate, low, or very low income households. The ordinance allows for construction of the units, or for payment of in-lieu fees, and conditions for the project include income certification provisions, a resale control mechanism, and if applicable, density bonuses. The ordinance provides for a density bonus of up to 10 percent in the residential project, provided that a density bonus does not conflict with the goals of the Countywide Plan. In addition, conditions require a written agreement to indicate the number, type, location, approximate size and construction scheduling of all dwelling units.

Land Use Goals and Criteria for the Development of Hamilton Air Force Base

Hamilton Air Force Base, located adjacent to the project site, was decommissioned in 1974. The General Services Administration (GSA) made a subsequent determination that 1650 acres of the site were surplus property. An Environmental Impact Statement, prepared by GSA evaluated disposition and a variety of uses for federal surplus property at Hamilton Air Force Base.[10] The following categories of use were evaluated in the EIS document: aviation, regional shopping, office, industry, wildlife and flood control and the "balanced community."

A Memorandum of Decision was issued in June 1980 by GSA which provided for disposal of the base using a combination of the alternatives analyzed in the EIS. A large portion of the base (including 3000 feet of runway and the antenna field adjacent to proposed Bel Marin Keys 5) was designated as a wildlife sanctuary under jurisdiction of the U.S. Fish and Wildlife Service. The memorandum has become the focus of legal action by the California State Lands Commission, Bay Conservation and Development Commission and a Marin Coalition of Aircraft Owners and Pilots. These groups have filed suit against GSA contesting violation of state land rights, the Coastal Zone Management Act, and the National Environmental Policy Act. At this time, negotiations are continuing, but the future uses and ultimate disposition of Hamilton AFB remain unresolved.

Currently (August 1982), Hamilton AFB is owned by the U. S. Army, U. S. Navy and the U. S. State Department. The Navy administers all of the existing housing, 1197 dwelling units, although various branches of the Armed Services use the housing facilities. Some of this housing (505 units) is located in Rafael Village west of Highway 101. The Navy also owns and operates all utility systems for the entire base.

The Army has several programs operating at Hamilton including an Army Reserve Training Center and the 6th Army Flight Detachment which has requested further use of the runway for aircraft operations.

The Coast Guard has a Pacific Strike Team and Oil Spill Task Force located at Hamilton. They have a lease arrangement currently, but they have requested ownership to establish a permanent facility.

The U. S. State Department has title to land for its Asian Refugee Processing Center. Future plans for this center are uncertain although current uses are expected to continue through the summer of 1983.

In December of 1979, the City of Novato and the County of Marin adopted goals for the future development of Hamilton Air Force Base. The reason that this is relevant in consideration of the Bel Marin Keys Unit 5 project, is that future uses at Hamilton may have impacts on the Bel Marin development, and vice versa.

The goals agreed on by the two jurisdictions are to encourage development of the following type in the area: office and commercial uses, preferably high intensity and of major scale, such as regional or home offices for major corporations, light industrial and research development uses, housing for a broad range of income levels, retail facilities to serve the new community, a hotel-conference center, provision of transportation, recreation and education services for the development, and use of lowlands for agricultural production.

In short, these goals express a desire to create a balanced community which can provide housing and employment opportunities, and all of the needed services to support these activities.

At the same time, the following policy is included in the Regional Airport Plan, which has been adopted as part of both the Metropolitan Transportation Commission (MTC) Regional Transportation Plan and the Association of Bay Area Governments (ABAG) Regional Plan: "The primary reliever general aviation airport role should be shared by Hamilton Air Force Base, Napa County, Sonoma County and Nut Tree airports, with local government permitting only compatible land use around the airports."[11] Thus the position of these two regional planning agencies is that the Hamilton site should continue to function as an aviation facility.

Marin County Bicycle Plan

In order to accommodate the numerous activities associated with bicycle use, The Bicycle Plan for Marin proposes development of a County-wide system of bicycle facilities. The plan recommends that over 400 miles of bicycle route be delineated in the County. Some of these routes are intended to serve transportation needs, while the other routes are for recreational purposes.

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The Bicycle Plan recommends that bicycle planning become a required part of the design of private developments.

Impacts would be the same for Alternatives A through E. The proposed site plan does not delineate bicycle paths or bicycle parking facilities. Bicycle access would be desirable for both single and multi-family residential units as well as for the proposed recreational and commercial facilities.

Mitigation Measure - Marin County Bicycle Plan

The following mitigation measures are recommended for the project as proposed, as well as for Alternatives B through E.

(Developer Responsibility)

- A bicycle lane should be delineated along Bel Marin Keys Boulevard, between the vehicular parking and through traffic lanes.
- Bicycle parking facilities should be provided at the mini park and neighborhood park sites, the community center and the neighborhood commercial site.
- (Except Alternative B) A bicycle parking facility should be provided at the proposed commercial marina, near the Bel Marin Keys Boulevard bicycle lane's termination.

Local Agency Formation Commission (LAFCO) and the City of Novato Sphere of Influence

The Local Agency Formation Commission (LAFCO), created by the State Legislature in 1963, is the local authority which designates future growth and service areas of cities and special districts located in each of the State's counties. The purpose of LAFCO is threefold: to determine where and when urban development requiring services from cities and special districts should occur; to promote reorganization of local governmental agencies where current structures cause public confusion; and to protect designated environmentally sensitive and agriculturally productive lands from conversion to urban uses.

In November 1980, LAFCO removed Bel Marin Keys (which includes the project site) from the boundary of Novato's Sphere of Influence.[12]

The Urban Service Area Boundary, developed by LAFCO, delineates areas that should receive city and special district services before those which lie outside of the boundary. LAFCO's policy places Bel Marin Keys outside of both Sphere of Influence and Urban Service Area Boundaries. The Marin County Board of Supervisors and Novato City Council concur with LAFCO policy; however, the Marin County Planning Commission and the Novato Planning Commission agree that Bel Marin Keys should be excluded from the Urban Services Area but believe that it should be located within the sphere of influence.

A proposal for incorporation of the Bel Marin Keys Community Services District was submitted to the Marin LAFCO in March 1982. The proposal requests that approximately 2,300 acres (the project site represents 1,610 acres of this area) of water-related residential and open space use be incorporated as a city.

The impacts of the proposed Bel Marin Keyes Unit 5 development as they relate to incorporation of the entire Bel Marin Keys area are discussed in Section E - Public Service and Fiscal Implications.

Bay Conservation and Development Commission (BCDC)/San Francisco Bay Plan

The San Francisco Bay Conservation and Development Commission (BCDC) has jurisdiction within the 100 foot wide shoreline band, extending inland from the highest point of tidal action on the project site. BCDC's jurisdiction was established by the McAteer-Petris Act in 1965. The Commission's two fundamental objectives are to protect the Bay as a great natural resource for the benefit of present and future generations, and to develop the Bay and its shoreline to their highest potential with a minimum of Bay filling.

BCDC has recently completed (April 1982) a study, "Diked Historic Baylands of San Francisco Bay," with a series of technical reports.[13] The tentative findings and policies proposed in that study are included in Appendix I. However, at this time, BCDC has no jurisdiction over diked historic baylands other than the 100-foot-wide shoreline band. (The Corps of Engineers is the only agency with permit authority.)

Portions of the project site which are within BCDC's jurisdiction lie at the extreme easterly edge of the property along the Bay. The Commission has stated that the development proposal for the project site should provide maximum feasible public access to the shoreline.[14] Other issues of concern expressed by BCDC regarding the proposed development are the importance of agricultural use on diked lands and the potential impacts of the alternative mitigation plans. For detailed discussion of impacts on agricultural land, please see Section K and for discussion of alternative mitigation plans, see Section L.

The Bel Marin Keys Unit 5 site appears on map 12 of the Bay Plan, without a priority designation. Therefore, as long as the portion of the site within BCDC's jurisdiction takes advantage of the Bay setting and provides maximum feasible public access to the shoreline, it could receive BCDC approval.

Shoreline Public Access. Public access is not delineated on the proposed master plan. The eastern edge of the actual development (commercial marina area) would be approximately one half mile from the bay shoreline.

The property's shoreline would be included in the proposed mitigation areas; in Alternatives C and E this area would be retained for agricultural use and in Alternatives A, B and D it would be used for marsh restoration and habitat. Alternatives C and E would more easily accommodate shoreline access along a continuous levee. The lack of public access to the shoreline would continue with no project (Alternative F).

Mitigation Alternatives

Alternatives A, B and D

- A pedestrian/bicycle trail should be located on the levee which separates the proposed development from the mitigation area. A viewing platform should be constructed along the eastern bank of the lagoon between the lock and Novato Creek.

Alternatives C and E

- Shoreline access should consist of a pedestrian/bicycle trail situated on the levee that borders the mitigation area's perimeter. A pedestrian/bicycle crossing should be constructed as part of the navigational lock and a viewing platform should be provided near the mouth of Novato Creek.

California State Lands Commission

The State Lands Commission within the Resources Agency has jurisdiction over those states which are beneath waterways and also over some submerged or tide lands. This would include Novato Creek and possibly some portions of the proposed project site. A Judgement Quieting Title, filed December 16, 1945, and a Boundary Agreement with the State of California, State Lands Commission, filed November 3, 1961, established the property boundaries for the properties fronting on the tide and submerged lands along the south bank of Novato Creek. However, two parcels (AP 157-172-10,11) may have been excluded from the boundary agreement (Title Report dated September 16, 1981). These two parcels which are located immediately north of the antenna field at Hamilton AFB, front on San Pablo Bay. The State Lands Commission will require a title study to review the boundary line agreements. In addition, the Commission will review the design details of the proposed navigational lock on Novato Creek to determine if construction will involve dredging of state lands. If dredging of state lands is proposed, a dredging permit from this agency will be required. The Commission will review the project at the time of permit application and may require specific mitigation measures as conditions of permit approval.

California Department of Fish and Game

The Department of Fish and Game (DFG) has jurisdiction over the Bel Marin Keys 5 site by authority of the Fish and Game Code Section 1603 regarding stream bed modification. Construction of a navigational lock on Novato Creek will require authorization from DFG. In addition, it serves as a review agency for Army Corps of Engineers permit applications. The DFG reviews projects to determine conformance with the Basic Wetlands Protection Policy of the Resources Agency and the San Francisco Bay Management Guidelines. See Section L - Vegetation and Wildlife for additional discussion.

U.S. Department of the Army, Corps of Engineers

Project construction requires a Department of the Army permit under Section 10 of the River and Harbor Act (RHA) of 1899 (33 U.S.C. Sec. 403) and Section 404 of the Clean Water Act (CWA) (33 U.S.C. Sec. 1344). Section 10 of the RHA requires a permit for any structures or work in or affecting navigable waters of the U.S. Section 404 of the CWA requires a permit for the discharge of dredged or fill materials into the waters of the U.S. The "waters of the U.S." includes adjacent wetlands. The issuance or denial of a Corps permit is based on an evaluation of the expected impact of the propsed activity and its intended use on the public interest. Corps permit jurisdictions are conceptually diagrammed in Exhibit D-3.

The project sponsor submitted a permit application to the Corps in October 1981. A copy of the application, is included in Appendix I.

Department of the Army regulations (33 CFR 320.4) also require the Corps to determine the desirability of using alternative locations and methods (to the proposed activity) and to discourage the unnecessary alteration or destruction of wetlands. Specifically, the District Engineer, when determining whether or not to issue a permit under these authorities, is required to consider whether an activity proposed for a wetlands area is primarily dependent upon being located in, or close to, the aquatic environment and whether feasible alternate sites are available.

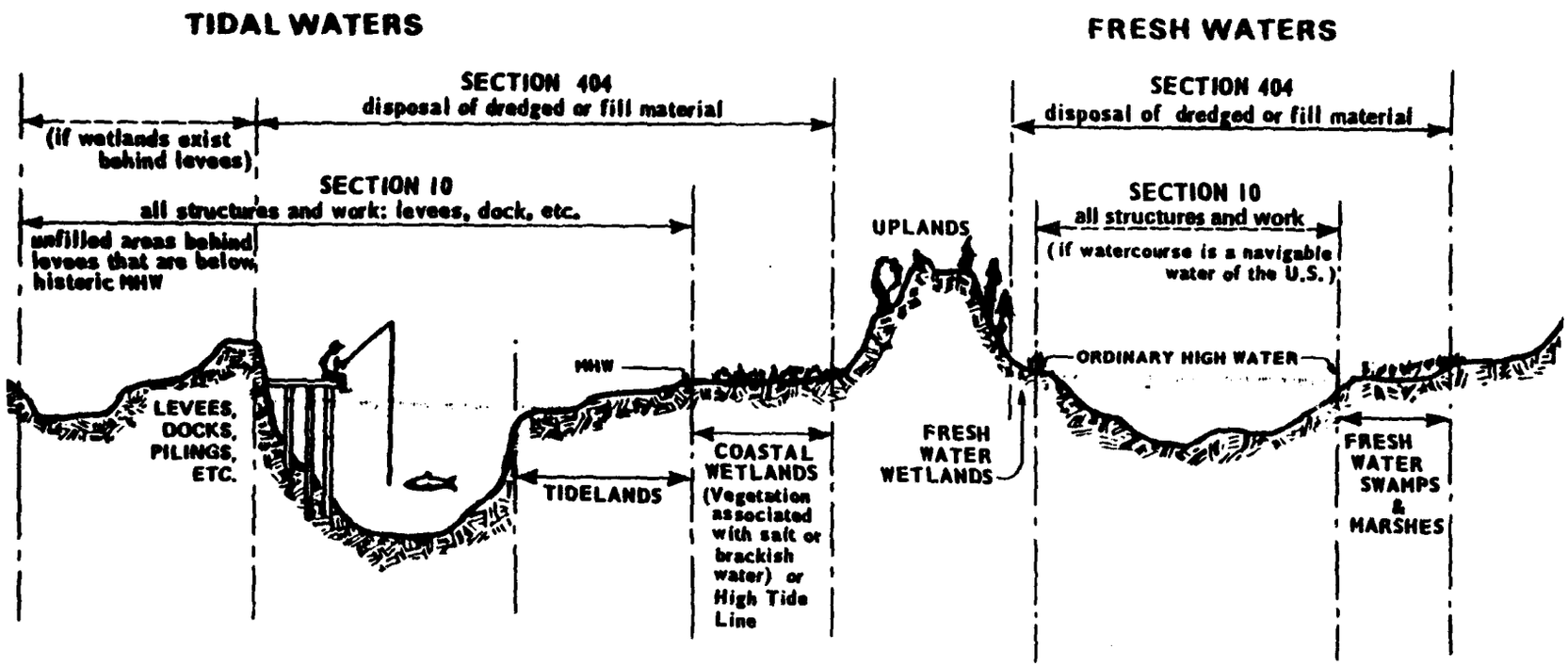
All of the development aspects of Alternatives A through E are within jurisdiction of the Corps and would require a permit (off-site mitigation areas may or may not be within Corps jurisdiction). The following paragraphs summarize the applicable portions of the laws, policies and regulations which must be considered by the Corps in order to issue a permit.

1. National Environmental Policy Act (NEPA)

   The National Environmental Policy Act (NEPA) is the basic national charter for protection of the environment. NEPA proceudres insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The proposed project requires thorough environmental review under NEPA in the form of an Environmental Impact Statement in order to determine permit status by the Corps of Engineers.

2. Clean Water Act

   The Clean Water Act (Section 404) regulates the discharge of dredged or fill materials into the waters of the U.S. by requiring a permit from the Department of the Army. The Army bases its evaluation on 404(b)(1) guidelines set forth by the Environmental Protection Agency which give specific requirements for the use of disposal sites for dredged or fill materials. These guidelines (40 CFR Part 230), which are regulatory,



NOTE:
IN ADDITION TO SECTIONS 10 AND 404 JURISDICTIONS, THE CORPS REGULATES THE TRANSPORTATION OF DREDGING MATERIAL FOR THE PURPOSE OF DISPOSING INTO OCEAN WATERS (SECTION 103).

source:
United States Army
Corps of Engineers
...Serving the Army
...Serving the Nation
San Francisco District

TORREY & TORREY INC. 2T environmental/urban planning and design	Corps of Engineers Regulatory Jurisdiction	EXHIBIT D3

prohibit "the discharge of dredged or fill material if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other adverse environmental consequences." The practicability of an alternative must take into account cost, existing technology and logistics in light of overall project purposes, but need not require ownership of an alternative site by the project applicant. For projects which are non-water-dependent, it is presumed that alternative sites located in non-aquatic areas would be available and would have a less severe impact on the aquatic ecosystem. The information and evaluation required by these guidelines has been included in this EIR/EIS to the extent that it is currently available.

3. Coastal Zone Management Act of 1972

Section 307(c) of this act, as amended, prohibits the Corps of Engineers from issuing a Department of the Army permit in a coastal zone unless the permit applicant has furnished certification that the proposed activity complies with the State's coastal zone management program in this case the Bay Conservation and Development Commission (BCDC) Bay Plan.

Section 307(c)(3)(A) of the Coastal Zone Management Act requires any proposed activity requiring a Federal permit to be consistent with the State's program (Bay Plan) if it would affect land or water uses within the coastal zone, regardless of the project location. The conditions of compliance with the Bay Plan have been discussed in this section under Bay Conservation and Development Commission (BCDC)/San Francisco Bay Plan.

4. Fish and Wildlife Coordination Act

This act requires the Corps to consult the U. S. Fish and Wildlife Service, National Marine Fisheries Service, and California Department of Fish and Game during preparation of an environmental study prior to issuance of a Department of the Army permit. Formal consultation with these agencies will occur through their review of the Corp's Public Notice and thus EIR/EIS. The Corps of Engineers' regulatory program requires the District Engineer to give great weight to the views of these agencies in evaluating a permit application. All three agencies have expressed concerns which are discussed in Section L Vegetation and Wildlife.

5. Endangered Species Act

This act was passed in 1973 to provide protection for animal and plant species that are currently in danger of extinction ("endangered") and those that may become so in the forseeable future ("threatened"). Section 7 of this Act requires federal agencies to ensure that their actions do not have adverse impacts on the continued existence of threatened or endanagered species or on the designated areas (critical habitats) that are important in conserving those species. The U. S. Fish and Wildlife Service maintains current lists of species which have been designated as

threatened or endangered. At this time, the salt marsh harvest mouse and the clapper rail, both listed as endangered species, have been reported from the Novato Creek area. The impacts of the proposed development on the habitats of these species is discussed in Section L Vegetation and Wildlife

6. National Historic Preservation Act of 1966, as Amended, and Executive Order 11593, Protection and Enhancement of the Cultural Environment (May 13, 1971)

This act established the National Register of Historic Places and requires the Corps of Engineers to consider the impacts of proposed activities on properties included in the National Register. Executive Order 11593 requires the Corps, when considering issuance of a permit, to identify in consultation with the state historic preservation agency any property potentially affected by the proposed action which is eligible for listing in the National Register. No properties listed or proposed for listing in the National Register, State Historic Landmarks or other known cultural resources are located within or adjacent to the project site. The California Archaeological Site Inventory of Sonoma State University conducted an archaeological records search. They report that no previously recorded archaeological sites, National Register sites, or California Landmarks exist on the site or immediately adjacent to the project boundaries. A complete archaeological disucssion is given in Section M, Archaeology.

7. Executive Order 11988, Floodplain Management (May 24, 1977)

In order to reduce the risk to human safety, health, welfare and property associated with floods and in order to preserve the natural and beneficial values served by floodplains, federal agencies are directed by this Order to evaluate the potential effects of actions, including the granting of permits, which they may take in floodplains. This EIR/EIS evaluates these effects, including the effects of other practicable alternatives as required by the Order in Section I. Hydrology, Water Quality, Erosion and Sedimentation.

8. Executive Order 11990, Protection of Wetlands (May 24, 1977)

This Order calls for federal agencies to "preserve and enhance the natural and beneficial values of wetlands" in carrying out agency activities which involve wetlands. Because the order specifically exempts issuance of federal permits to private properties on non-federal property, this authority would not be considered by the Corps of Engineers during review of an application for a Department of the Army permit. However, the U. S. Fish and Wildlife Service frequently cites Executive Order 11990 as one authority for making formal comments on non-federal projects to the Corps of Engineers during the review period, under provisions of the Fish and Wildlife Coordination Act. Further discussion of the wetland issue is included in Section L. Vegetation and Wildlife.

9. CEQ Memorandum on Analysis of Impacts on Prime or Unique Agricultural Lands

This memorandum from the Council on Environmental Quality, dated August 11, 1980, instructs all federal agencies to determine the effects of agency or agency-permitted actions on prime or unique agricultural lands, and to examine alternatives to these actions, in the preparation of environmental documents under NEPA. Federal agencies are also instructed to cooperate with state and local governments in their efforts to help retain these lands.

The land proposed for the project is not considered prime or unique as defined by the U. S. Department of Agriculture. A complete discussion of agricultural impacts is included in Section K. Soils and Agriculture.

10. California Wetlands Policy

The Resources Agency of California has issued a Basic Wetlands Protection Policy which is used by all departments, boards and commissions when reviewing proposed projects. The policy prohibits authorization or approval of projects that fill or otherwise harm or destroy coastal, estuarine or inland wetlands unless specific conditions are met. The proposed project and alternatives would come under review using this policy. A complete discussion is included in Section L. Vegetation and Wildlife.

Footnotes

[1]Telecon, Mr. Michael May, General Services Administration (GSA), Region 9.

[2]A. B. Page, Director, Real Property Division, GSA, letter to H. Eric Borgwardt.

[3]U.S. General Services Administration, Final EIS, Disposition and Use of Federal Surplus Property at Hamilton Air Force Base, 1980.

[4]Telecon, Mr. Charles Joseph, Manager/Engineer, Novato Sanitary District.

[5]Marin County Code, Title 22, Zoning, Section 22.47.032.

[6]Marin County Code, Title 22, Zoning, Sections 22.42.022 and 22.42.042.

[7]Telecon, Mr. Craig Page, Home Savings and Loan.

[8]Marin County Code, Title 22, Zoning Ordinance, Section 22.54.020, Revised April 1981.

[9]Zoning Ordinance, Section 22.54.020.

[10]U.S. General Services Administration, Final EIS, Disposition and Use of Federal Surplus Property at Hamilton Air Force Base, 1980.

[11]C. Brittle, MTC Staff Liaison, Letter to H. Eric Borgwardt, October 1, 1981.

[12]Sphere of Influence is defined as the probable maximum service area of the City of Novato and special districts, Marin LAFCO, Novato Community Urban Sphere of Influence Final Report, February 1982, p. 4.

[13]BCDC "Diked Historic Baylands of San Francisco Bay", April 1982, Technical Reports: "Ecological Values", Recreational Values", "Agricultural Values", "Summary of Powers Exercised by Regulatory Agencies", "Guidelines for Enhancement and Restoration".

[14]Margit Hind, BCDC, Coastal Development Analyst, letter to Collette Meunier and Don Dickenson, Marin County Planning Department, February 22, 1982.

E. PUBLIC SERVICE AND FISCAL CONSIDERATIONS

This chapter evaluates the fiscal impacts of the proposed Bel Marin Keys Unit 5 on local public service agencies. The analysis identifies the potential effects of the development on public service delivery, service costs, and public revenues.

A major issue addressed in this chapter is the fiscal impact of Unit 5 on the Bel Marin Keys community if it becomes a city. Bel Marin Keys is presently an unincorporated area in Marin County. Unsuccessful efforts to incorporate Bel Marin Keys have been made in the past. A current incorporation proposal is before the Marin LAFCo.

If Bel Marin Keys incorporates, the new city would assume the responsibility for certain services now provided by Marin County. The city would also receive some public revenues that the county presently collects, and have the potential to levy certain taxes and fees not now levied by the county.

Although incorporation would alter some service responsibilities and revenue sources, many public services for Unit 5 would be unaffected if Bel Marin Keys became a city. Services such as fire protection, water, sewage treatment, public schools, and flood control are presently provided to Bel Marin Keys residents by individual special districts. It is likely that Unit 5 will receive these services from the same districts regardless of whether incorporation occurs.

This analysis will identify the fiscal implications of two arrangements for providing public services to Unit 5. It will evaluate the differences in revenues and costs associated with Unit 5 that result from an unincorporated and incorporated Bel Marin Keys. In other words, the analysis will identify the effects of Unit 5 on public revenues and expenditures assuming: (1) Bel Marin Keys remains unincorporated; and (2) Bel Marin Keys becomes a city. Because many of the services provided to Unit 5 would be the responsibility of individual special districts, only a limited number of service and revenue issues would be affected by incorporation.

1. Environmental Setting

a. Public Revenues

The land proposed for Unit 5 is presently undeveloped. The only public revenue source generated by this area is the property tax. In fiscal year 1981-82, the area of Unit 5 had an assessed valuation of about $1.7 million, resulting in property tax revenues of about $17,000 (excluding taxes to retire voter approved bonds). Property tax revenues from the area are distributed to all taxing jurisdictions in the county. The recipient of the largest single portion of the revenues is Marin County, which receives about 26 percent of the taxes (about $4,400 in 1981-82).

b. Public Services

Virtually no public services are currently provided on a regular basis to the area proposed for Unit 5. Several public agencies would have the responsibility for services if development occurs. These are the same agencies that presently provide services to the existing Bel Marin Keys community. Exhibit E-1 identifies the services and the responsible agencies. This matrix describes the service responsibilities assuming Bel Marin Keys remains an unincorporated area.

The area of Unit 5 is now wholly within the jurisdiction of all the agencies shown in Exhibit E-1 except the Bel Marin Keys Community Services District (CSD) and the Novato Sanitary District. Annexation of Unit 5 to these districts would be required to provide services. The present jurisdiction of the Bel Marin Keys CSD includes neither the portions of Unit 5 where single family detached units would be constructed south of the existing lagoons nor the multi-family development in area 1. The areas proposed for the marina, the extended Bel Marin Keys Boulevard, and the commercial developments are now included in the CSD. None of the area of Unit 5 is currently part of the Novato Sanitary District. This analysis assumes that Unit 5 would be annexed to these districts.

If Bel Marin Keys incorporates, the new city would assume the responsibility for several services now provided by Marin County. The services affected by incorporation would be police, street maintenance, general administration, and planning and building inspection. All other services would be unaffected by incorporation, except perhaps the services now performed by the Bel Marin Keys CSD. It is possible that once the new city is established the CSD would be dissolved and its responsibilities assumed by the city. The effects of incorporation on the service responsibilities for Unit 5 are outlined in Exhibit E-2.

Police

Police services in Bel Marin Keys are currently provided by the Marin County Sheriff's Department and the California Highway Patrol. The Sheriff's Department conducts routine patrolling and responds to calls for service in Bel Marin Keys. The Highway Patrol provides traffic control and traffic safety services to the community.

Bel Marin Keys is part of the Sheriff's Department's beat 33. This beat provides a one-officer, 24-hour patrol. In addition to Bel Marin Keys, the beat includes Ignacio and other unincorporated areas surrounding Novato. Bel Marin Keys accounts for about 16 percent of the total population served by beat 33. During the graveyard shift, the beat area expands to include a portion of Marinwood. Then, Bel Marin Keys represents about 11 percent of the population in the beat.

EXHIBIT E-1

PUBLIC SERVICE PROVIDERS TO UNIT 5
ASSUMING UNINCORPORATED BEL MARIN KEYS

SERVICE	AGENCY							
	MARIN COUNTY	BEL MARIN KEYS COMMUNITY SERVICES DISTRICT	NOVATO FIRE DISTRICT	NORTH MARIN WATER DISTRICT	NOVATO SANITARY DISTRICT	MARIN COUNTY FLOOD CONTROL DISTRICT ZONE #1	NOVATO UNIFIED SCHOOL DISTRICT	CALIFORNIA HIGHWAY PATROL
Police	●							●
Street Maintenance	●							
General Administration and Planning	●							
Parks and Recreation		●						
Street Lighting		●						
Lagoon Maintenance		●						
Fire Protection			●					
Water				●				
Sewage Treatment					●			
Flood Control						●		
Public Schools							●	

Source: Recht Hausrath & Associates

EXHIBIT E-2

SERVICE RESPONSIBILITIES AFFECTED BY
INCORPORATION OF BEL MARIN KEYS

SERVICE	RESPONSIBILITY ASSUMED BY BY NEW CITY	RESPONSIBILITY POSSIBLY ASSUMED BY NEW CITY	RESPONSIBILITY UNAFFECTED BY INCORPORATION
Police	●		
Street Maintenance	●		
General Administration and Planning	●		
Parks and Recreation		●	
Street Lighting		●	
Lagoon Maintenance		●	
Fire Protection			●
Water			●
Sewage Treatment			●
Flood Control			●
Public Schools			●

Source: Recht Hausrath & Associates

The patrol and investigations divisions of the Sheriff's Department presently consist of 81 sworn officers. This is equivalent to about 1.28 officers per 1,000 residents of unincorporated Marin County.

Street Maintenance

The maintenance of public streets in Bel Marin Keys is performed by the Marin County Public Works Department. The department's maintenance responsibilities include roadway repairs, restriping, sweeping, storm drain clearance, and curb and gutter repairs. Street lighting is not a responsibility of the public works department. This service is provided by the Bel Marin Keys CSD.

Community Services

The Bel Marin Keys Community Services District provides several services to residents of Bel Marin Keys. The district provides street lighting; maintenance of locks and lagoons; recreational programs; and maintenance of parks and roadway medians. The district's maintenance and street lighting services are performed under contracts. The street lighting services are provided by contract with PGandE.

Fire Protection

The Novato Fire Protection District provides fire protection to Bel Marin Keys. The community is served by a first-response station located on the west side of Highway 101 near the intersection of Ignacio Boulevard and Enfrente Road. This station (Station 4) has an average staffing of six personnel. Two personnel are typically assigned to ambulance duty. Firefighting equipment at the station includes two engines, an aerial truck, a tanker, and a squad truck.(1)

The second-response station for Bel Marin Keys is Station 2, located to the west of Highway 101 on Novato Boulevard. This station has a staff of four to five firefighters. Firefighting equipment includes one engine and a squad truck.

The existing development in Bel Marin Keys is at the limit of the department's five-minute response time standard. Station 4 can reach most areas in Bel Marin Keys within five minutes, although poor traffic conditions at the Highway 101-Ignacio Boulevard interchange can sometimes result in a response time that exceeds this standard. Areas of Bel Marin Keys that may be beyond the department's five-minute response capability during normal traffic include the most distant sections of Montego Key, Bahama Reef, and Calypso Shores.

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(1) R. W. Beyer, Fire Marshal, Novato Fire Protection District, personal conversation, March 9, 1982.

Water

The North Marin County Water District provides water to the greater Novato area, including Bel Marin Keys. The water supplies of the district are drawn from Stafford Lake and the Russian River. The Russian River typically accounts for about 75 to 80 percent of the water consumed in the district.

Bel Marin Keys is served by a 16-inch pipeline located under Bel Marin Keys Boulevard. This pipeline is reduced to 14 inches between Del Oro Lagoon and Bahama Reef.

Sewage Treatment

The Novato Sanitary District operates three wastewater treatment plants. Bel Marin Keys is within the service area of the Ignacio treatment plant.

The Ignacio plant treats 1.3 million gallons per day (mgd) in wastewater flow. The plant is currently performing above the design capacity of 1.2 mgd, while continuing to satisfactorily meet interim water quality requirements established by the California Regional Water Quality Control Board. Plans for upgrading and expansion of the Ignacio plant to a capacity of 2.1 mgd have been completed, and construction is expected to begin in late summer, 1982. The project is expected to be completed in late 1984. The design population of the expanded facility is 21,600.(1)

The Ignacio plant presently serves about 16,480 residents.(2) The design population of the expanded plant would allow for an increase of about 5,100 persons within the service area. The capability of the expanded plant to accommodate additional population growth could be somewhat different, however, depending on future wastewater generation characteristics. The plant's design population is expected to be reached in 1991.

Flood Control

The Marin County Flood Control and Water Conservation District provides flood control services to county residents. Bel Marin Keys is in the district's Flood Control Zone 1.

The district provides few direct services to Bel Marin Keys. Most storm drainage needs are performed by other agencies. The county public works department maintains the catch basins and storm drains in the streets, and the CSD maintains the lagoons (which serve as holding areas for storm runoff).

The flood control district is planning a major project to correct long-term flooding problems associated with Novato Creek. This project is not expected to get underway for several years.

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(1) Charles Joseph, Manager/Engineer, Novato Sanitary District, personal conversation, March 9, 1982.

(2) Ibid.

Public Schools

School-age children in Bel Marin Keys attend schools in the Novato Unified School District. Students in grades K-6 attend Hamilton School, students in grades 7-9 attend San Jose Junior High, and students in grades 10-12 attend Novato High. The current enrollments and capacities of these schools are as follows:

EXHIBIT E-3

CURRENT ENROLLMENT AND CAPACITY OF SCHOOLS
ATTENDED BY BEL MARIN KEYS STUDENTS

School	Grade	Enrollment 1982	Enrollment Capacity
Hamilton	K-6	625	800
San Jose Junior High	7-9	635	900
Novato High	10-12	1,100	1,300

Source: Novato Unified School District.

Enrollments have been declining in Novato schools in recent years. Between 1975 and 1981, total enrollment in the district dropped over 20 percent. Enrollment is expected to decline further. Forecasts prepared by the district show total enrollment falling by 18-26 percent between 1981 and 1986.(1) Enrollment declines have led to the closure of five elementary schools since 1973. A junior high will be closed at the end of the 1982-83 school year.

Declining enrollments and school closings are major factors affecting the district's plans to reorganize the grade structure. Beginning in a few years, it is likely that senior high schools will include 9th grade students (high schools now contain grades 10-12). Grades K-8 are also likely to be restructured, although the ultimate grade divisions have yet to be determined.(2)

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(1) Novato Unified School District, "Enrollment Projections," memorandum from Paul Mobley to District Board of Trustees, no date.

(2) Paul Mobley, Deputy Superintendent, Novato Unified School District, personal conversation, March 9, 1982.

2. Environmental Impacts and Recommended Mitigations

This section identifies the important service delivery issues and potential fiscal impacts of the project and alternatives. It also suggests mitigation measures where applicable. The fiscal effects of Unit 5 are described under two conditions: (1) Bel Marin Keys remains an unincorporated community; and (2) Bel Marin Keys becomes a city. If Bel Marin Keys incorporates, it is assumed incorporation will occur prior to the completion of Unit 5.

The proposed master plan for Unit 5 includes residential and commercial development as well as a marina. The alternatives under consideration in this analysis differ with respect to the type of residential units and the inclusion of the marina.

The characteristics of residential development for the alternatives are summarized in Exhibit E-4. Population estimates are also presented in Exhibit E-4. Alternatives A (the proposed project), B, and C would consist of 1,178 units and 3,115 residents. Alternatives D and E would consist of 1,178 units and 3,011 residents. The lower population estimate for alternatives D and E is the consequence of assumptions about differences in average household size. Households are assumed to be smaller on average in alternatives D and E, because some units would be smaller and built at a higher density than proposed for the other alternatives. With alternatives D and E, 352 multi-family units (half of which are assumed to be townhouses and half condominiums) would be built, instead of the same number of single family units in Alternatives A, B and C.

Unit 5 would significantly increase the population of Bel Marin Keys. The development would add to Bel Marin Keys a population more than twice the number of the community's existing residents, and over one and one-half times the number of residents when Keys Landing and Unit 4 are completed and fully occupied. With Unit 5, the population of Bel Marin Keys would be about 4,910-5,010 residents (the range reflects the difference in housing types among the Unit 5 alternatives).(1)

All the alternatives (except the no-project alternative) would provide for a small neighborhood commercial center and a professional office complex. Alternatives A, C, D, and E would also include a 602-berth marina and associated commercial facilities (such as a fuel dock, chandlery, and restaurant). A marina would not be included as part of alternative B.

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(1) The population estimate assumes:

Existing Bel Marin Keys (1980)	502 Units	1,359 Residents
Keys Landing	28 Units	81 Residents
Unit 4	159 Units	460 Residents
TOTAL	689 Units	1,900 Residents

EXHIBIT E-4

HOUSING UNIT TYPES AND POPULATION ESTIMATES,
BY ALTERNATIVE: BEL MARIN KEYS UNIT 5

HOUSING UNIT TYPE	NUMBER OF UNITS		PERSONS PER UNIT	POPULATION	
	Alternatives A/B/C	Alternatives D/E*		Alternatives A/B/C	Alternatives D/E
Single Family Detached	426	74	2.9	1,235	215
Townhouse	312	488	2.7	842	1,318
Condominium	316	492	2.5	790	1,230
Inclusionary	124	124	2.0	248	248
TOTAL	1,178	1,178		3,115	3,011

*Half of the multi-family units that replace single family units in these alternatives are assumed to be townhouses and half are assumed to be condominiums.

Source: Master Plan, Proposed Bel Marin Keys Unit 5, and Recht Hausrath & Associates estimates.

This analysis compares the public revenues and service expenditures affected by Unit 5 in the first year after development is complete. It has been assumed that the construction of Unit 5 would begin in 1985 and last for about ten years (the actual pace of development would depend on future market conditions). The first year after construction ends would be 1995. Revenues and expenditures are shown for this year. Where relevant, service delivery and revenue issues for other years are discussed.

The long development period expected for Unit 5 affects the certainty of many of the assumptions used in this analysis. Assumptions about the future must be made to estimate revenues and expenditures. Some important factors that influence the estimates are fairly certain, but many others are very difficult to predict. The assumptions used in this analysis are considered reasonable given information available in early 1982. To the extent possible, economic and policy changes that might occur by 1995 have been taken to account. Yet, changes will occur that cannot be anticipated, and se changes could affect the results of this analysis. Issues of particular uncertainty are discussed in greater detail in subsequent sections.

One major assumption affecting both costs and revenues is the rate of inflation. All cost and revenue amounts in this analysis are estimated in 1981 dollars (sometimes referred to as constant or "real" dollars because they represent a level of purchasing power in any one future year equivalent to their purchasing power in 1981). Future costs and revenues are adjusted to 1981 dollars based on an assumption of 8 percent annual inflation over the analysis period. If inflation averages more than 8 percent, the cost and revenue estimates in 1981 dollars would be too high. If inflation averages less than 8 percent, the estimates would be too low.

a. Public Revenues

The following section focuses on the primary sources of annual operating revenue generated by development of Bel Marin Keys Unit 5. Those jurisdictions that do not rely primarily on user charges are of particular interest: Marin County, the Bel Marin Keys Community Service District, an incorporated Bel Marin Keys, and the Novato Fire Protection District. These jurisdictions would receive additional revenue as both property values and population increased with development of Unit 5. Permit and inspection fees, fines, user charges and one-time fees such as those charged by the water and sanitary districts are not estimated in this analysis. It is assumed that revenue collection, in these cases, would be closely related to the costs of providing services.

Property Tax Revenue

Increased property tax revenue would be the most important source of funds for most local agencies from development of Unit 5. The calculation of tax revenue is based on several assumptions about the pace and value of Unit 5 development. These assumptions are discussed below, as they apply to the assessment of residential, commercial and personal property, whether or not Bel Marin Keys incorporates.

Residential construction would begin in 1985, with the first homes available for sale in 1986. Homes would be built in even annual increments over the ten year buildout period. The first year that all residential units would be on the property tax rolls is 1995.

Commercial facilities (neighborhood commercial center, offices, and marina) would first appear on the tax rolls in 1990. It is assumed that the proposed community center (10,000 square feet in Area 3) would be owned by the Bel Marin Keys CSD or the new city, and consequently would not be subject to the property tax.

The assessed value of real property in Unit 5 would be based on the market value of the residential units and the appraised value (determined by the income approach) of the non-residential facilities.

Exhibit E-5 shows the average market value of the various types of residential units proposed, if they were available for sale in 1981. These estimates are based on an analysis of the characteristics of the proposed development and a review of price trends for housing in Bel Marin Keys, Marin County, and water-oriented communities in the region.

EXHIBIT E-5

AVERAGE MARKET VALUES OF UNIT 5 RESIDENCES
(Constant 1981 Dollars)

Unit Type	Average Value
Single Family Detached	$250,000
Townhouse	165,000
Condominium	150,000
Inclusionary Units	65,000

NOTE: These are estimates of the market value of these units if sold in 1981. The market values in the years the units would be sold (1986-1995) would be higher, if housing prices appreciate as assumed in this analysis.

Source: Recht Hausrath & Associates estimates.

These estimates of housing values incorporate the developer's proposal that 124 multi-family units be made available for moderate income households. This is in accordance with Marin County's inclusionary zoning ordinance.(1) A $65,000 unit would be affordable for a two-person household with income near the median level for the San Francisco-Oakland Standard Metropolitan Statistical Area (SMSA), according to standard financing criteria about the income necessary to support a home mortgage.

Marin County's inclusionary ordinance contains a provision limiting the resale price of moderate income units. The provision is part of the deed to the property. The resale price must be the original purchase price adjusted by the change in the Bay Area Consumer Price Index or median income since the date of purchase, or the fair market value, whichever is lower.(2) Resale is administered by the Marin County Housing Authority. In this analysis, the limitation on prices of moderate income units is assumed to be the rate of inflation. Consequently, the market value of these units remains constant in 1981 dollars.

Each year 12 percent of all houses that were first sold in a previous year are assumed to be resold. This is an approximate nation-wide average. The sale price of resold houses is assumed to be the same as the price of a new house built that year, and their assessed value is based on that price.

Prices of houses can be expected to increase faster than the rate of inflation. It is assumed that average house prices would increase 4 percent per year in real terms. Thus, the value of a single family unit sold in 1986 would be $304,000, and the value of a single family unit sold in 1987 would be $316,000. Both values are in 1981 dollars.

Exhibit E-6 displays the assumptions used to determine appraised value for the commercial development in Unit 5. These estimates are based on standard criteria for profitable operations for each type of use. They rely on the underlying assumption that there would be market support for the proposed facilities. It is also assumed that the facilities would be leased by the developer to office tenants, retail establishments, and appropriate marina operations. The income derived from these leases is the basis for the valuation of the commercial development for property tax assessment purposes.(3)

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(1) Marin County's ordinance applies only to development in unincorporated areas. In this analysis, it is assumed that incorporated Bel Marin Keys would institute a similar inclusionary zoning ordinance.

(2) Board of Supervisors, County of Marin, Chapter 22.97, Provisions for Low and Moderate Income Housing.

(3) Landon Reid, Commercial Appraiser, Marin County Assessor's Office, personal conversation, March 24, 1982. A capitalization rate of 8 percent is used to convert the annual income to an appraised value.

EXHIBIT E-6

ASSUMPTIONS FOR APPRAISAL OF
COMMERCIAL DEVELOPMENT IN UNIT 5
(Constant 1981 Dollars)

	Size	Annual Lease Income
Area 3		
Office	17,500 Sq.Ft.	$184,000
Neighborhood Commercial Center	34,400 Sq.Ft.	475,000
Marina		
Berths	602 Berths	821,000*
Restaurant	6,000 Sq.Ft.	138,000
Boat Sales	5,900 Sq.Ft.	7,500
Chandlery	7,500 Sq.Ft.	100,300
Boat Repair		6,800
Fuel Dock		7,000

*Income from berth rentals.

Source: Master Plan, Proposed Bel Marin Keys Unit 5 and Recht Hausrath & Associates estimates based on conversations with staff, Marin County Assessor's Office.

Commercial property is sold infrequently. Office buildings sell, on average, once every 15 to 20 years. In Marin County, one shopping center has been sold in the past forty years and one marina in the last fifty years.(1) No re-sales of commercial property are assumed to occur in Bel Marin Keys between 1990 and 2000.

State law limits increases in assessed value to 2 percent per year until the property is resold. Once resold, the assessed value reflects the selling price. In subsequent years, the assessed value can increase by a maximum of 2 percent per year until the property is resold again. In real terms, the assessed value of a property in Bel Marin Keys would decline 5.6 percent per year until resold, assuming 8 percent annual inflation.

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(1) L. Reid, Marin County Assessor's Office,

Personal property would also be subject to the property tax in Bel Marin Keys. Personal property includes tenant improvements in offices and retail establishments, as well as boats. Boats are taxed in the jurisdiction in which they are berthed. Therefore, the boats of both Unit 5 residents and non-residents (those berthing boats at the marina) would add to the property tax revenue base.

Personal property is not subject to the 2 percent annual limitation on increases in assessed value. Fixtures and tenant improvements are assessed each year according to their market value adjusted by a depreciation schedule. For this analysis, it is assumed that value lost through depreciation would be offset by new purchases so that the overall value would remain constant in real terms. Boats are assessed each year at their fair market value, which may increase faster than the rate of inflation.(1) It is assumed that, on average, the value of boats in Bel Marin Keys remains constant in 1981 dollars.

Exhibit E-7 shows the total increase in assessed value(2) from Unit 5 development in 1995 for each of the alternatives. Property tax revenue in 1995 would equal 1 percent of the assessed value, exclusive of taxes levied to retire bonded indebtedness.

State law requires that increases in assessed valuation be distributed among taxing agencies based on procedures outlined in Assembly Bill 8 (AB 8). In short, AB 8 stipulates that increases in assessed value that occur in a tax rate area benefit the agencies that have jurisdiction there. This requires that county auditor-controllers establish separate distributions for each tax rate area in order to allocate increased assessed value (and increased tax revenues) to the appropriate agencies.(3)

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(1) Thomas Brown, Marin County Assessor's Office, personal conversation, March 24, 1982.

(2) Assessed value equals 100 percent of market value.

(3) Marin County, its incorporated areas and special districts have agreed on a tax exchange formula for cases of annexation. According to the Board of Supervisors Resolution No. 79-397, revenues are shifted to special districts "only when one jurisdiction assumes responsibility for services already provided to a parcel by another jurisdiction." This policy applies in Bel Marin Keys to both the CSD and the Novato Sanitary District. By annexing that part of Unit 5 not within its jurisdiction, the CSD would be extending new services to this area; the county does not provide services there now. The county policy quoted above holds that in such cases, no shift of property tax revenues would occur. Similarly, the Novato Sanitary District would receive no additional property tax revenue with annexation of the Unit 5 area because services are not currently provided there.

EXHIBIT E-7

ESTIMATES OF INCREASED ASSESSED VALUE
FROM BEL MARIN KEYS UNIT 5: 1995
(Constant 1981 Dollars)

	ALTERNATIVES			
	A/C	B	D/E	F
Residential Development	$ 284,400,000	$ 284,400,000	$ 242,200,000	-0-
Commercial Development				
Office	1,700,000	1,700,000	1,700,000	-0-
Neighborhood Commercial	4,400,000	4,400,000	4,400,000	-0-
Marina	8,100,000		8,100,000	-0-
Personal Property				
Office	400,000	400,000	400,000	-0-
Neighborhood Commercial	1,000,000	1,000,000	1,000,000	-0-
Marina	800,000		800,000	-0-
Boats	14,800,000	3,400,000	12,000,000	-0-
TOTAL	$ 315,700,000	$ 295,400,000	$ 270,716,000	-0-

NOTE: Detail may not add to total due to independent rounding. Average estimates for personal property are based on average costs per square foot for each use. Boats are valued, on average, at $20,000 each (1981 dollars). The estimate for boats includes both those berthed at the marina and those kept by residents at their own berths.

Source: Recht Hausrath & Associates estimates, based on information supplied by Marin County Assessor's Office.

Exhibit E-8 shows the allocation of property tax revenue from Unit 5 development for 1995, according to current distribution formulas. County policy does not provide for allocations of increased assessed value to jurisdictions annexing areas in which services were not previously provided. Therefore, the Bel Marin Keys CSD would only receive additional revenue from that portion of the new development occurring in tax rate areas already within its jurisdiction. No revenue is shown for the Novato Sanitary District because of this county policy regarding special district annexation of areas to be newly serviced.

In cases of incorporation, state law allows transfer of property tax revenue among agencies that provide services in the incorporated area if service responsibility is transferred. If existing agencies maintained their current responsibilities in incorporated Bel Marin Keys, the new city would not receive any additional property tax revenue from Unit 5 development. This is the case assumed here.

An incorporated Bel Marin Keys might receive some property tax revenue from Unit 5 development. If the CSD were dissolved and the new city assumed its service responsibilities, the city would receive the property tax revenue from Unit 5 that would otherwise accrue to the CSD. The Municipal Organization Act of 1977 (Government Code Sections 35000 to 35500) allows a new city to negotiate with the county board of supervisors for additional property tax revenue beyond that gained through the dissolution of a taxing jurisdiction (e.g. the Bel Marin Keys CSD) in favor of the new city. The procedure applies only to property tax revenue used to finance existing services, however. Because no services are currently provided in the area to be developed as Unit 5, this negotiation procedure would not apply to property tax revenue generated by Unit 5.

A portion of the property tax revenue for transit, library, fire and service districts in Marin County is pooled in the Special District Augmentation Fund (SDAF) and redistributed according to negotiated formulas. Not all districts that contribute to the fund also receive revenues from it, and some receive less than they contribute. In 1981-82, fire districts received 89.2 percent of total SDAF revenue. Lighting districts and the county library district shared the balance.

In 1981-82 the Novato Fire Protection District and the Bel Marin Keys CSD contributed to the SDAF. The fire district received more than it contributed, while the CSD received none of its contribution to the fund. Estimates of additional property tax revenue that would be received by each district from Unit 5 development must account for this shift.

It should be noted that the formulas for the special district augmentation fund are recalculated annually. For the purposes of this report, it is assumed that the SDAF, and a formula approximating the current one, would remain in force.

The property tax revenue estimates in Exhibit E-8 incorporate SDAF adjustments.

EXHIBIT E-8

DISTRIBUTION OF INCREASED PROPERTY TAX REVENUE FROM BEL MARIN KEYS UNIT 5: 1995
(Constant 1981 Dollars)

JURISDICTION	ALTERNATIVE			
	A/C	B	D/E	F*
County General Fund	$ 854,900	$ 806,100	$ 729,100	-0-
Bel Marin Keys CSD	86,200	61,400	86,200	-0-
Novato Fire Protection District	607,500	572,800	518,100	-0-
North Marin Water District	3,100	3,000	2,600	-0-
Flood Control District	71,200	67,100	60,700	-0-
Novato Unified School District	1,068,400	1,007,400	911,100	-0-
All Others	456,600	430,600	389,400	-0-
TOTAL PROPERTY TAX REVENUE	$3,157,000	$2,953,500	$2,707,200	-0-

*If the property proposed for Unit 5 remained undeveloped, annual property tax revenues in 1995 would amount to about $8,000 (in 1981 dollars).

NOTE: Detail may not add to total due to independent rounding. Distributions to Bel Marin Keys and the Novato Fire Protection District incorporate Special District Augmentation Fund adjustments, based on formulas provided by the Marin County Auditor-Controller.

Source: Recht Hausrath & Associates estimates based on formulas provided by the Marin County Auditor-Controller.

Revenue from alternative B would be less than that from alternatives A and C because the marina is excluded. The difference, however, is not as great as that between alternatives A and C and the higher density alternatives.

The higher density alternatives (D and E) would generate less revenue for two primary reasons. The average market value of the multi-family units would be less than the average market value of the single family detached units they replace. In addition, residents of Unit 5 single family detached units are assumed to keep boats at their own berths, as do current Bel Marin Keys residents. The residents of the 352 town-houses and condominiums in alternatives D and E would not have direct access to the lagoons and could not keep boats in the same manner.(1) The value of the boats is particularly significant because it is not subject to the maximum 2 percent annual limitation on increases in assessed value.

Real Property Transfer Tax

The real property transfer tax rate in Marin County is $0.55 per $500 of the sales value of property sold. In unincorporated areas, the county receives all the revenues from this tax. In incorporated areas, the revenues are shared equally between the city and the county. Thus, if Bel Marin Keys remains unincorporated, Marin County would collect all real property transfer tax revenues from the initial sales and subsequent resales of Unit 5 property. If Bel Marin Keys incorporates, these revenues would be shared between the county and the new city.

Exhibit E-9 shows the real property transfer tax revenue generated for Marin County and incorporated Bel Marin Keys by the sales of Unit 5 residential units in 1995. No resales of non-residential development are assumed to occur between 1990 and 2000.

EXHIBIT E-9

REAL PROPERTY TRANSFER TAX REVENUE FROM UNIT 5: 1995
(Constant 1981 Dollars)

Alternatives	Unincorporated Bel Marin Keys	Incorporated Bel Marin Keys	
	Marin County	Marin County	Bel Marin Keys
A/B/C	$84,000	$42,000	$42,000
D/E	72,000	36,000	36,000
F	---	---	---

Source: Recht Hausrath & Associates estimates.

(1) There would probably be more Unit 5 residents using the marina in these alternatives. Some small-boat storage would probably be provided for use of residents, as it is in Area 1 in the proposed project. The value of these boats, however, would be insignificant relative to the value of boats berthed at homeowners' dock or at the larger marina.

The estimated revenue for 1995 reflects the initial sales of units built in the final year of the buildout period, in addition to the resale in that year of homes initially purchased in earlier years. Revenues in subsequent years would be derived from periodic resales of Unit 5 residences.

Between 1985 and 1995, real property transfer tax revenue would be generated from the initial sales during the buildout period and resales of units built in previous years. Over these years, the total revenue is estimated to be about $448,700 from alternatives A, B, and C and $380,000 from alternatives D and E. The county would receive all of this revenue if Bel Marin Keys remains unincorporated. The county and the new city would each receive half ($224,350 or $190,000) if Unit 5 were developed in incorporated Bel Marin Keys.

Sales Tax Revenues

In Marin County, revenue from the 1 percent local sales tax rate is distributed as follows: all the revenue from sales in unincorporated areas accrues to the county, and all the revenue from sales in incorporated areas accrues to the city in which the sale occurred. There are no existing sources of sales tax revenue in Bel Marin Keys. Current residents contribute to taxable retail sales elsewhere in Marin County and out of the county.

The taxable expenditures of the residents of Unit 5 and workers in the proposed office development would be one source of new local sales tax revenue. Development of the proposed commercial facilities would also result in some shift of sales tax revenue among jurisdictions. The neighborhood convenience shopping center proposed for Unit 5 would be expected to capture some of the taxable expenditures of other Bel Marin Keys residents. Residents as well as others would make taxable expenditures at the proposed marina.

Residents of Unit 5 would be expected to have shopping habits similar to those of existing Bel Marin Keys residents. Most Bel Marin Keys residents shop for convenience goods at stores in Novato. The convenience stores nearest Bel Marin Keys are located in shopping centers in the Ignacio area west of Highway 101 (Pacheco Plaza, Ignacio Center, and Del Prado Square). There are no retail stores in Bel Marin Keys now and there are no nearby shopping centers on the east side of Highway 101. The comparison goods shopping of Bel Marin Keys residents is more widely distributed. The major shopping areas are in Novato, San Rafael, Larkspur, and centers outside Marin County, for example, downtown San Francisco and the Hilltop Mall in Contra Costa County. The proposed Novato regional shopping center would capture some of the comparison goods spending of Unit 5 residents. In addition, Unit 5 residents would probably account for some increase in taxable sales at shopping centers and stores in unincorporated areas of Marin County.

The neighborhood shopping center proposed in the Unit 5 master plan would offer convenience goods and services. There would consequently be some shift in the shopping of Bel Marin Keys residents away from the nearby shopping centers in Novato. The development of the neighborhood shopping center would have no significant effect on the comparison shopping patterns of Bel Marin Keys residents.

Only the sales that would generate revenue for either the county or incorporated Bel Marin Keys are analyzed in this report. These would be sales at the Bel Marin Keys center and marina and in other stores in unincorporated Marin County. Taxable purchases of comparison goods made by Unit 5 residents in Marin County cities and out of the county are not estimated.

The taxable convenience goods sales at the Bel Marin Keys neighborhood commercial center would consist of sales to Unit 5 residents, and to workers in the nearby office development proposed for Unit 5, as well as sales to other Bel Marin Keys residents who shift their spending from other competing shopping centers, primarily in Novato. Therefore, the effect of the neighborhood commercial center would be to create a sales tax base in Bel Marin Keys (benefiting either Marin County or incorporated Bel Marin Keys) and to reduce somewhat the convenience retail sales that would otherwise occur in Novato.

The proposed marina (with its restaurant, chandlery, and fuel dock) would also be a source of sales tax revenue. While some of these sales would be shifts from other Bay Area marinas, the major portion would be a new source of revenue for either Marin County or an incorporated Bel Marin Keys.

In summary,

- If Bel Marin Keys remains unincorporated, Marin County would receive the local sales tax revenue from taxable sales at the neighborhood convenience center and the marina. The majority of these sales would not otherwise have occurred in unincorporated areas and may consequently be considered a net addition to county sales tax revenue base.

- If Bel Marin Keys incorporates, the new city would receive the local sales tax revenue from sales within its boundaries. All of the taxable sales at the neighborhood center and the marina would be net additions to the city's local revenue base.

- Whether or not Bel Marin Keys incorporates, Unit 5 residents would contribute to taxable retail sales in other unincorporated areas of Marin County, thus generating some additional revenue for the county.

- In any case, development of the Unit 5 commercial facilities would result in a loss of some sales tax revenue for certain cities, particularly Novato. Novato would lose some sales tax revenue from sales of taxable convenience goods.

- The net effect of Unit 5 on Novato may not be a loss of sales tax revenue however. The Novato regional shopping center is proposed to be completed before Unit 5. The size of this center and the proposed tenant mix suggest that Unit 5 residents would shop there for comparison goods. The tax gain would probably be larger than the tax loss from the convenience centers.

Exhibit E-10 shows the 1995 estimates of total and taxable sales at Unit 5 commercial facilities. It should be noted that this study assumes that the market would support the proposed convenience center and marina. The estimates of sales reflect this assumption with an approximate level of sales at full operation. It is also assumed that sales keep pace with inflation, remaining constant in 1981 dollars.

EXHIBIT E-10

RETAIL SALES IN UNIT 5
COMMERCIAL DEVELOPMENT: 1995
(Constant 1981 Dollars)

Facility	Annual Sales	Percent of Sales That Are Taxable	Annual Taxable Sales
Neighborhood Shopping Area:			
Convenience Grocery	$2,400,000	30%	$ 720,000
Miscellaneous Convenience Shops and Services	1,700,000	70%	1,190,000
Marina	2,900,000	95%	2,755,000
TOTAL			$4,665,000

Source: Recht Hausrath & Associates estimates.

Exhibit E-11 shows estimates of sales tax revenue (1 percent of taxable sales) for the alternatives under the two incorporation assumptions. This revenue would be generated from taxable sales in Bel Marin Keys and in unincorporated Marin County. The primary difference between the alternatives is due to the marina. The alternative without the marina (alternative B) would result in sales tax revenues 50-60 percent lower than the four alternatives that include the marina. The smaller population in the high density alternatives (D and E) would also result in lower revenues, though the difference is not as significant.

EXHIBIT E-11

SALES TAX REVENUE FROM UNIT 5: 1995
(Constant 1981 Dollars)

Alternatives	Unicorporated Bel Marin Keys	Incorporated Bel Marin Keys	
	Marin County	Marin County	Bel Marin Keys
A/C	$52,900	6,200	$46,700
B	25,300	6,200	19,100
D/E	52,700	6,000	46,700
F	-0-	-0-	-0-

NOTE: These revenues are one percent of the annual taxable sales shown in the preceding exhibit plus estimates of taxable sales by Unit 5 residents in unincorporated Marin County.

Source: Recht Hausrath & Associates estimates.

Other Taxes

Franchise Tax. This tax is levied on businesses granted exclusive rights by local governments to provide services in their jurisdiction. Utilities, refuse collection and cable television are those services typically subject to the franchise tax. The tax is usually a percentage of gross annual receipts. In unincorporated areas the county assesses the franchise tax. In incorporated areas, either the county or the city (not both) can levy the franchise tax on service provided in that jurisdiction.

- Unincorporated Bel Marin Keys - Marin County taxes the gross receipts from both PGandE service and cable T.V. service in unincorporated areas. Development of Unit 5 would generate additional revenues for the county. Revenue from the PGandE franchise tax would increase in real terms over time, as PGandE rates are assumed to increase 5 percent more than the annual rate of inflation (based on state Energy Commission forecasts). Revenues from the tax on cable T.V. service (provided in Bel Marin Keys by Liberty T.V. Cable) would remain constant over time if, as assumed here, service charges were adjusted periodically to keep pace with inflation.(1)

- Incorporated Bel Marin Keys - Incorporated Bel Marin Keys would probably establish a franchise tax schedule. It is assumed here that both PGandE service and cable T.V. service would be taxed at 5 percent of gross receipts. These are the tax rates currently in effect in unincorporated Marin County. In addition, the receipts of the refuse collection service (Novato Disposal Service, Inc.) would probably also be subject to the franchise tax, also at the 5 percent tax rate. While receipts from the PGandE franchise would increase in real terms, receipts from the other service providers would remain constant in 1981 dollars, as service charges are assumed to keep pace with inflation.

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(1) No additional expansion of service is assumed except for that currently planned (increasing basic service from 12 to 25 channels). The expanded basic service and the proposed fee schedule are the basis for the estimates used in this analysis.

Exhibit E-12 shows the total franchise tax revenue generated by Unit 5 development in unincorporated and incorporated Bel Marin Keys. The estimates reflect assumptions about residential, office, convenience retail and marina commercial use of each service.

EXHIBIT E-12

FRANCHISE TAX REVENUE FROM UNIT 5: 1995
(Constant 1981 Dollars)

Alternatives	Unincorporated Bel Marin Keys	Incorporated Bel Marin Keys	
	Marin County	Marin County	Bel Marin Keys
A/C	$80,700	-0-	$86,000
B	79,200	-0-	84,300
D/E	78,800	-0-	84,100
F	-0-	-0-	-0-

Source: Recht Hausrath & Associates estimates.

Revenues are lower for alternative B because of the absence of the marina. The estimate of energy consumption at the marina may be low because consumption by berth users was not specifically considered. If energy consumption at the marina were higher than assumed here, the franchise tax revenues from alternatives A, C, D and E would also be higher.

Revenues from alternatives D and E are lower because average energy consumption is assumed to be lower in the higher density dwelling units. Consumption assumptions have been adjusted to reflect the smaller average household size in alternatives D and E.

Business License Tax. Cities can impose taxes on businesses operating in their jurisdictions as a source of general fund revenue. Counties can only levy a fee to cover the costs of licensing.

The non-residential development in Unit 5 would include businesses subject to a business license tax levied by incorporated Bel Marin Keys. If the area remains unincorporated, there would be no business license tax revenue from Unit 5 development.

The business license tax most often takes the form of a flat rate tax on gross receipts. Other methods are used, however; for example, the City of Novato charges a flat fee per establishment plus a sliding scale fee based on the number of employees.

The estimates shown in Exhibit E-13 are based on a tax schedule similar to that imposed by the City of Novato (per establishment and per employee). A business license tax assessed on the basis of gross receipts might generate higher revenue. For 1995 estimates it is assumed that fees would be periodically adjusted to account for inflation; revenue thus remains constant in 1981 dollars.

EXHIBIT E-13

BUSINESS LICENSE TAX REVENUE FROM UNIT 5: 1995
(Constant 1981 Dollars)

Alternatives	Incorporated Bel Marin Keys
A/C/D/E	$1,200
B	900
F	-0-

Source: Recht Hausrath & Associates estimates.

Novato Fire Protection District Special Assessment. In November, 1980 voters in the Novato Fire Protection District approved a special tax to compensate for revenue losses subsequent to Proposition 13. Property owners in the district pay the annual tax based on square footage of building space. The tax varies by type of structure: for example, up to 3 cents per square foot for residential buildings and up to 5 cents per square foot for commercial buildings. Each year, the District Board sets the tax rate based on the proposed budget. The rate for the 1981/82 fiscal year is 1.8 cents per square foot for residential buildings and 3.0 cents per square foot for commercial buildings. The special assessment will terminate in 1984 unless a continuation or new assessment is approved by a two-thirds majority of district voters.

Because of uncertainty regarding future voter approval, the estimates of potential special assessment revenue for the fire district are presented as a range. The low end reflects the current tax rate, and the high end the maximum currently authorized tax rate. If future voter-approved special assessments are higher than the current maximum rate, the revenue from Unit 5 would be higher than estimated here.

Exhibit E-14 shows the range of special assessment revenue that the fire district would collect from Unit 5 development.

EXHIBIT E-14

NOVATO FIRE DISTRICT SPECIAL ASSESSMENT REVENUE
FROM UNIT 5: 1995
(Constant 1981 Dollars)

Alternatives	Annual Revenue 1995	
	Low	High
A/C	$10,600	$17,500
B	10,300	17,200
D/E	9,200	15,000
F	---	---

Source: Recht Hausrath & Associates estimates.

State Subventions

Revenues from four major state subventions would increase as a result of Unit 5 development: the motor vehicle license fee, cigarette tax, and 2104, 2106, and 2107 motor vehicle fuel taxes. All of these subventions are distributed to local governments on the basis of complex formulas. The most significant factor is generally population. Population estimates are based on the most recent federal decennial census or a subsequent census validated by the Population Research Unit of the Department of Finance. In practice, the state controller calculates annual distributions using population estimates that account for annual changes in total population.

In this analysis, the estimated population of Unit 5 at full buildout (1995) is the basis for local subvention distributions. The most recent federal census would be 1990; however, all the units would not be either complete or occupied by then, according to the assumed phasing schedule. It is consequently assumed that an estimate of post-census population would be made. The best estimate, from a long term perspective, is that based on number of units and average household size.

Motor Vehicle License Fee. Cities and counties receive revenue from the state vehicle license fee fund. The source of these funds is the annual license fee required of all vehicle owners at 2 percent of the market value of the vehicle. Distribution to local governments is based on population.

In fiscal year 1981-82 the total amount to be distributed was reduced by a $131 million transfer to the state general fund as a means of improving the state budget position. For fiscal year 1982-83, the governor's budget proposes a larger transfer of $450 million. Consequently, per capita distributions have been reduced significantly since fiscal year 1980-81 and are proposed to be reduced even further. For example, cities received about $18 per capita in fiscal year 1980-81; they would receive about one-third as much in fiscal year 1982-83 according to the governor's proposed reductions.

For this analysis it is assumed that motor vehicle license fee revenue would be distributed at this lower level of funding in the future. It is also assumed that this lower level per capita distribution remains constant in 1981 dollars. In other words, the value of the revenue base increases with the average rate of inflation. According to these assumptions, the 1995 statewide per capita distribution of motor vehicle license fee revenue would be $6.40 to counties and $5.90 to cities (in constant 1981 dollars).

Exhibit E-15 shows estimates of revenue on the basis of the population increase due to development of Unit 5. The higher density alternatives show less revenue because of the fewer new residents expected in these units.

EXHIBIT E-15

MOTOR VEHICLE LICENSE FEE REVENUE
FROM UNIT 5: 1995
(Constant 1981 Dollars)

Alternatives	Unincorporated Bel Marin Keys	Incorporated Bel Marin Keys	
Keys	Marin County	Marin County	Bel Marin
A/B/C	$19,900	$19,900	$18,400
D/E	19,300	19,300	17,800
F	---	---	---

Source: Recht Hausrath & Associates estimates.

Cigarette Tax. The state imposes a tax of 10 cents per package on cigarettes sold in the state. Cities and counties share 3 cents per package. The counties' share is distributed on the basis of local sales tax collected. Half of the cities' share is distributed this way and half on the basis of population.

The cigarette tax is assessed at a flat rate per package rather than as a percentage of the sale price; therefore, revenue does not increase with inflation. Although this tax may be among the "sin taxes" likely to be raised in the near future, any increase would probably only offset further reductions in other subventions. This analysis assumes that the current tax rate remains in effect and that revenue declines in real terms. The assumption is also made that statewide per capita consumption does not change. Therefore, the relationship between total revenue and per capita distribution is assumed to remain the same over time.

In 1980-81, counties received 17 percent of the local distribution of cigarette tax revenue. This amounted to about 1 cent per dollar of local sales tax revenue. Cities received the balance, distributed at about 3 cents per dollar of local sales tax revenue and $1.90 per capita. It is assumed that a similar distribution would apply in 1995, but total revenue would reflect the real decline in constant dollar value.

Exhibit E-16 shows the 1995 cigarette tax revenue from development of Unit 5. The city distribution would be available only if Bel Marin Keys incorporates. The lower amount shown for alternative B reflects the reduction in local taxable sales due to the absence of the marina. The portion distributed to incorporated Bel Marin Keys on the basis of population is less under the higher density alternatives because the Unit 5 population would be smaller, according to the average household size assumptions used here.

EXHIBIT E-16

CIGARETTE TAX REVENUE FROM UNIT 5: 1995
(Constant 1981 Dollars)

Alternatives	Unincorporated Bel Marin Keys	Incorporated Bel Marin Keys	
	Marin County	Marin County	Bel Marin Keys
A/C	$160	-0-	$2,500
B	60	-0-	2,200
D/E	160	-0-	2,400
F	-0-	-0-	-0-

Source: Recht Hausrath & Associates estimates.

Motor Vehicle Fuel Tax. Under Sections 2104, 2106 and 2107 of the Streets and Highways Code, cities and counties receive funds from the state motor vehicle fuel and use fuel taxes. These funds are to be used primarily for street and road maintenance. Legislative changes enacted in Senate Bill 215 (SB 215), which go into effect January 1983, will increase the total amount of revenue available for local distribution. The tax rate on both gasoline and diesel fuel sales will be raised from 7 cents to 9 cents per gallon. A portion of the revenue from the diesel fuel tax will be added to gasoline tax revenue for apportionment to counties under Section 2104 and to cities under Section 2107. In another SB 215 change, a greater percentage of the total revenues collected will be apportioned to counties and cities under these sections. Section 2106 governs the distribution of revenues to cities and counties. SB 215 did not change the method of distributing fuel taxes under this section.

Forecasts of future revenue available for distribution are based on assumptions about a number of variables, one of which is the fuel tax rate. For this analysis, it is assumed that the 9 cent per gallon tax rate (effective January 1983) would not change before 1995. Statewide fuel consumption forecasts are also used to estimate future motor vehicle fuel tax revenue.(1) Consumption is expected to continue to decline. Consequently, revenue would decline (in constant dollar terms) because it is assumed that the tax rate per gallon is not raised to keep pace with inflation and fewer gallons are consumed.

Finally, the distribution formula for fuel tax revenue includes several factors, the most important of which is population. Population forecasts prepared by the State Department of Finance are combined with the total revenue estimates derived from the tax rate and consumption assumptions to forecast future per capita distributions.

Marin County would receive additional Section 2104 revenue whether or not Bel Marin Keys incorporates. The estimated per capita distribution to counties in 1995 would be about $2.90, in constant 1981 dollars.

If Bel Marin Keys does not incorporate the county would receive additional 2106 revenue due to the increase in population of unincorporated areas attributable to Unit 5. If Bel Marin Keys incorporates, the county would not receive this revenue. Instead, the new city would receive additional revenue based on Unit 5's share of the population of all cities in the county. For section 2106 revenue the estimate for 1995 is $3.00 per capita, in constant 1981 dollars.

Section 2107 revenue would only be available to incorporated Bel Marin Keys. In 1995, the estimated per capita distribution statewide would be about $9.90, in constant 1981 dollars.

Exhibit E-17 displays the total 2104, 2106 and 2107 fuel tax revenue estimates from Unit 5, according to these assumptions. The higher density alternatives would generate less revenue because of the smaller population expected.

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(1) The source of statewide energy consumption forecasts is the California Energy Conservation and Development Commission, Independent Staff Transportation Fuel Demand Forecast: 1980-2000, February 1981.

EXHIBIT E-17

MOTOR VEHICLE FUEL TAX REVENUE
(SECTIONS 2104, 2106 AND 2107) FROM UNIT 5: 1995
(Constant 1981 Dollars)

Alternatives	Unincorporated Bel Marin Keys	Incorporated Bel Marin Keys	
	Marin County	Marin County	Bel Marin Keys
A/B/C	$10,100	$9,100	$12,700
D/E	9,700	8,800	12,300
F	-0-	-0-	-0-

Source: Recht Hausrath & Associates estimates.

Summary. Exhibit E-18 displays the total additional revenue from the major state subvention sources. Revenues from motor vehicle license and cigarette taxes are combined as general fund revenue sources. Fuel tax revenues are displayed separately because they are to be used for street maintenance and repair. The exhibit indicates that the difference among the alternative development proposals is not a significant factor in the distribution of subvention revenue.

Future Uncertainties. These subvention revenues have been estimated assuming that they will continue to be available to local governments in the future. The estimates used in this analysis incorporate some of the most recent proposals (from the Governor's 1982-83 budget bill) for a "one time" transfer of funds from local governments to the state general fund. A similar transfer (although a smaller amount) occurred in fiscal year 1981-82. In that year, certain subventions were repealed (liquor license fees, highway carrier in lieu fees and financial aid to local governments). All of these actions have been alternatives to activating the deflator mechanism (another means of reducing state aid to local governments) that became law subsequent to Proposition 13. Clearly, state-local finance arrangements are far from settled.

SB 215 provided for local voter-approved increases in the gasoline tax, in one-cent increments. If such a measure were passed in Marin County, or if statewide measures similar to SB 215 were enacted periodically to maintain a constant dollar level of revenue, fuel tax revenues would be higher than estimated here.

EXHIBIT E-18

SUMMARY OF STATE SUBVENTION REVENUE FROM UNIT 5: 1995
(Constant 1981 Dollars)

ALTERNATIVES	UNINCORPORATED BEL MARIN KEYS			INCORPORATED BEL MARIN KEYS					
	MARIN COUNTY			MARIN COUNTY			BEL MARIN KEYS		
	General Fund Revenue	Fuel Tax Revenue	Total	General Fund Revenue	Fuel Tax Revenue	Total	General Fund Revenue	Fuel Tax Revenue	Total
A/C	$20,100	$10,100	$30,200	$19,900	$9,100	$29,000	$20,900	$12,700	$33,600
B	20,000	10,100	30,100	19,900	9,100	29,000	20,600	12,700	33,300
D/E	19,500	9,700	29,200	19,300	8,800	28,100	20,200	12,300	32,500
F	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-

NOTE: Future state policy regarding subventions could change in the future. These estimates should be viewed as high-range figures, particularly for motor vehicle in-lieu fees and cigarette taxes (general fund revenue). Fuel tax revenues would be higher than shown here if measures similar to SB 215 were passed in the future or if the county, with voter approval, instituted the local 1 cent per gallon gas tax allowed by SB 215.

Source: Recht Hausrath & Associates estimates.

Considering all subventions together, however, it is more likely that local government revenues from this source will be lower, rather than higher, in the future.

Federal Revenue Sharing

All local governments are entitled to federal revenue sharing funds, which are allocated on the basis of population, personal income and tax effort. The funds can be used for any municipal purpose.

Congress recently extended the revenue sharing program through September 1983. In each fiscal year, 1982 and 1983, $4.60 billion will be distributed to local governments. Efforts to eliminate federal revenue sharing have not succeeded; however, total revenue has been reduced, primarily by cutting off the states' share of funding.

For this analysis, it is assumed that some form of general purpose revenue sharing will be available in the future. As has been the case in the past, total appropriations are assumed not to keep pace with inflation, so the amount distributed declines in real terms.

Marin County (county general fund) would receive additional revenue sharing funds as a consequence of Unit 5 development whether or not Bel Marin Keys incorporates. The county government's allocation from the total funds allocated to Marin County depends on its share of all local taxes levied in the county. In fiscal year 1981-82, county government received $4.50 per capita in federal revenue sharing funds (constant 1981 dollars). If Bel Marin Keys were to incorporate, the county government would claim a somewhat smaller proportion of the total local taxes levied, primarily due to the shift of potential sales tax revenue. Therefore, additional revenue sharing funds for the county general fund would be less if Bel Marin Keys becomes a city.

Incorporated Bel Marin Keys would also receive additional revenue sharing funds with development of Unit 5, in proportion to the changes in population, relative income and tax effort represented by Unit 5 development. In fiscal year 1981-82, Marin County cities received an average of about $6.10 per capita in federal revenue sharing funds.

Moreover, to the extent that the new development results in shifts in relative size, income, and tax effort, other Marin County municipalities would receive less than they would otherwise receive. The magnitude of this potential effect on other Marin County cities and towns is not estimated in this analysis.

Exhibit E-19 shows the additional federal revenue sharing funds generated by Bel Marin Keys Unit 5 in 1995. The per capita allocation to Marin County government and the average for all Marin County municipalities in fiscal year 1982-83 are used as the basis for these estimates. The estimates reflect the assumption that revenue would not keep pace with inflation. Marin County's allocation if Bel Marin Keys incorporates is estimated to be 15 percent less than it otherwise would be. This estimate is based on the percentage of total local tax revenue that the county would not receive if Unit 5 were developed in incorporated Bel Marin Keys. As in other revenue estimates, the difference between the alternatives reflects the difference in Unit 5 population depending on the density of the development.

EXHIBIT E-19

FEDERAL REVENUE SHARING FUNDS FROM UNIT 5: 1995
(Constant 1981 Dollars)

Alternatives	Unincorporated Bel Marin Keys	Incorporated Bel Marin Keys	
	Marin County	Marin County	Bel Marin Keys
A/B/C	$4,800	$4,000	$6,500
D/E	4,600	3,900	6,300
F	-0-	-0-	-0-

Source: Recht Hausrath & Associates estimates.

Summary of Public Revenues

Development of Bel Marin Keys Unit 5 would result in increased revenues from property taxes and other sources. Whether or not Bel Marin Keys incorporates would have a significant impact on the distribution of revenues. It would probably not result in a significant difference in the total amount of revenue generated by Unit 5.

Exhibit E-20 summarizes the total revenue by source for Marin County and incorporated Bel Marin Keys. Marin County would receive additional property tax revenue from development of Unit 5. The county would also receive increased real property transfer tax revenue, sales tax, franchise tax, and subvention revenue. If Bel Marin Keys were to incorporate, some of this additional revenue would shift from the county to the new city. As an incorporated area, Bel Marin Keys would also be able to collect certain tax and subvention revenue not otherwise available to the county.

If Bel Marin Keys were to incorporate, Marin County would receive about 15 percent less revenue from Unit 5 than if the area remained unincorporated. This is primarily the result of the split of potential real property transfer tax revenue, the shift of potential local sales tax revenue from the county to the new city and the loss of franchise tax revenue. The county would receive the same amount of additional property tax revenue from Unit 5 regardless of incorporation of Bel Marin Keys. Incorporation would not affect the single most important source of additional revenue for the county.

Unit 5 would generate additional revenue for the sources available to incorporated Bel Marin Keys. Assuming the CSD and the new city remain separate entities, the most important source of revenue from Unit 5 for the new city would be "other taxes", primarily PGandE franchise taxes. This source represents about 40 percent of the total additional revenues estimated here. Transfer tax revenue and local sales tax revenue would, together, make a similar contribution to additional city revenues from Unit 5.

Over time, revenue for the county from Unit 5 would probably decline, in real terms, while revenue for incorporated Bel Marin Keys would probably at least keep pace with inflation. This difference results from the relative importance of the different revenue sources. As shown in Exhibit E-20 the primary source for the county would be property tax revenue. The majority of this revenue would not be expected to keep pace with inflation because the assessed value of existing units (except those resold in any year) is constrained by the 2 percent limitation on annual assessed value growth. On the other hand, sales tax revenue would be based on sales that generally would be expected to keep pace with the rate of inflation. Real property transfer tax revenues and PGandE franchise tax revenue would be expected to increase faster than the average rate of inflation, assuming future house and energy price trends similar to those in the past.

Development of Unit 5 would result in additional property tax revenue for the Bel Marin Keys CSD, the Novato Fire Protection District, the County Flood Control District, the North Marin Water District, and the Novato Unified School District, with smaller amounts for other taxing jurisdictions. The Novato Fire Protection District would receive increased special assessment revenue based on the square feet of building area in Unit 5.

EXHIBIT E-20

SUMMARY OF REVENUES FROM UNIT 5 BY SOURCE, BY ALTERNATIVE: 1995
(Thousands of Constant 1981 Dollars)

REVENUE SOURCE	UNINCORPORATED BEL MARIN KEYS			INCORPORATED BEL MARIN KEYS					
	MARIN COUNTY			MARIN COUNTY			BEL MARIN KEYS		
	A/C	B	D/E	A/C	B	D/E	A/C	B	D/E
Property Tax	854.9	806.1	729.1	854.9	806.1	729.1	-0-	-0-	-0-
Real Property Transfer Tax	84.0	84.0	72.0	42.0	42.0	36.0	42.0	42.0	36.0
Sales Tax	52.9	25.3	52.7	6.2	6.2	6.0	46.7	19.1	46.7
Other Taxes	80.7	79.2	78.8	-0-	-0-	-0-	87.2	85.2	85.3
Subventions*	35.0	34.9	33.8	33.0	33.0	32.0	40.1	39.8	38.8
TOTAL	1,107.5	1,029.5	966.4	936.1	887.3	803.1	216.0	186.1	206.8

*Includes federal revenue sharing.

[illegible] There would be no additional revenue for any jurisdiction from Unit 5 under the "no project" alternative (Alternative F).

[illegible] Hausrath & Associates estimates.

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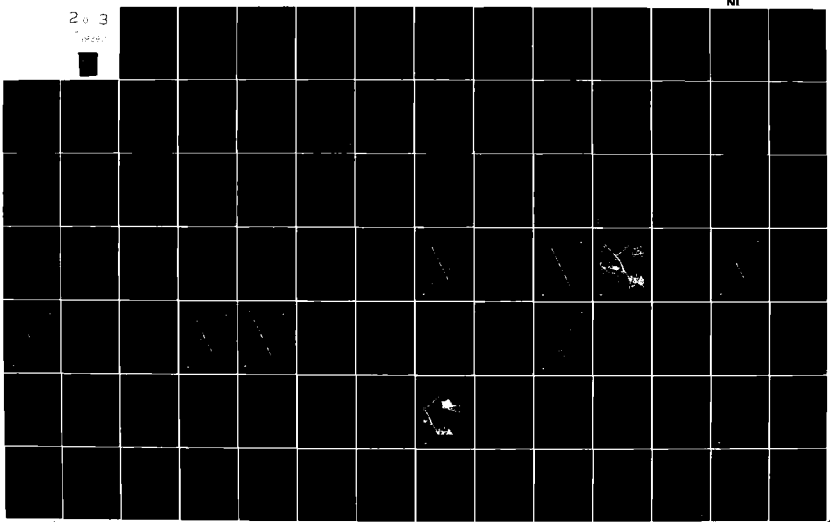

Exhibit E-21 summarizes these distributions. Over time, this additional revenue would decline in real terms (as a consequence of Proposition 13 limitations on assessed value increases) unless the rates of house price appreciation and turnover are higher and the rate of inflation is lower than assumed here.

For Marin County and the other taxing jurisdictions receiving a share of additional property tax revenue from Unit 5, the difference between the low density (A/C) and high density (D/E) alternatives is the most significant. Total revenues for Marin County from alternatives D and E would be about 13 percent lower than total revenues from alternatives A and C. For the other agencies, except the CSD,(1) the difference in revenues (property tax only) from low and high density alternatives would be about 15 percent. The variation in assessed value between the two density options would result in a more significant difference in revenue than would the variation in assessed value attributable to the marina and boats berthed there.

For incorporated Bel Marin Keys, the potential revenues from the marina are more important. The most significant difference among alternatives for the new city is between alternative B (no marina) and all others. The proposed marina facilities would be a primary source of sales tax revenue for the new city. Sales of boats and marine equipment and restaurant sales would constitute over 50 percent of the potential sales tax revenue base in Bel Marin Keys. The exclusion of the marina, therefore, results in a 14 percent (alternatives A/C) to 10 percent (alternatives D/E) difference in total additional revenues from Unit 5 for incorporated Bel Marin Keys.

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(1) There is no difference in revenue for the CSD between low and high density alternatives because property taxes from the area in which development would be different would not be allocated to the CSD.

EXHIBIT E-21

SUMMARY OF REVENUES TO OTHER LOCAL AGENCIES FROM UNIT 5: 1995
(Thousands of Constant 1981 Dollars)

	ALTERNATIVE		
	A/C	B	D/E
Bel Marin Keys Community Services District	86.2	61.4	86.2
Novato Fire Protection District	$618.1-$625.0	$583.1-$590.0	$527.3-$533.1
North Marin Water District*	3.1	3.0	2.6
Flood Control District	71.2	67.1	60.7
Novato Unified School District*	1068.4	1007.4	911.1
Novato Sanitary District*	-0-	-0-	-0-
All Others	456.6	430.6	389.4

*These three districts receive revenue from sources not evaluated in this report. The sanitary and water districts would receive substantial revenues from service fees. The school district would receive revenue from state education grants.

NOTE: Total revenue estimates for the Novato Fire Protection District include both property tax revenue and the estimated range of special assessment revenue. Alternative F would result in no additional revenue for any jurisdiction.

Source: Recht Hausrath & Associates estimates.

b. Service Delivery and Service Costs

The development of Unit 5 would result in added demand for services provided by public agencies in Marin County. This section evaluates the effect of Unit 5 on service demand, discusses how service districts would accommodate this demand, and estimates expenditures required to provide services.

Like the preceding section, the analysis of service costs identifies the effect of Unit 5 assuming either Bel Marin Keys remains unincorporated or the community becomes a city. The service effects on the Bel Marin Keys CSD are evaluated separately from the service effects on an incorporated Bel Marin Keys. This is done to show more clearly the impacts of Unit 5 on the various public agencies. It is possible that if Bel Marin Keys becomes a city the CSD would be dissolved and its functions taken over by the new city. In this case, the costs identified for the CSD would become the responsibility of the city.

The analysis assumes that the developer of Unit 5 would construct the major public infrastructure, including streets, sewer and water facilities, lagoons and lock. No public expenditures would be required for these basic improvements. An exception may be public parks. This is discussed in the analysis of the service effects on the CSD.

Services Provided by Marin County

Police, street maintenance, general government and planning services would be provided by Marin County to Unit 5 if Bel Marin Keys remains unincorporated. With the possible exception of some countywide general government functions, these services would be the responsibility of the new city should Bel Marin Keys incorporate.

This section identifies the effects of Unit 5 on county services if Bel Marin Keys remains unincorporated. It is possible that if Bel Marin Keys incorporates, the city would contract with the county for some of these services. This issue is discussed in the following section on services provided by an incorporated Bel Marin Keys.

Police. Unit 5 would result in additional demand for police services. The development would increase the patrolling responsibilities of the sheriff's department and add to the calls for service from Bel Marin Keys. Because Unit 5 would include commercial development as well as residential, some police service characteristics of Unit 5 would be different from the existing Bel Marin Keys community. The small amount of commercial development is not likely to have a significant effect on overall police demand in Unit 5, however.(1)

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(1) Robert Gaddini, Assistant Sheriff, Marin County Sheriff Department, personal conversation, March 17, 1982.

The increased police demand from Unit 5 would probably necessitate hiring additional officers to maintain existing service quality. A rough indication of the requirement for additional officers can be obtained by applying the current ratio of officers per thousand county residents (1.28 per 1,000) to the expected population of Unit 5.(1) This indicates a need for about four additional officers.

The actual effect of Unit 5 on the department's operations is uncertain. Depending on the population and police service characteristics in the northeastern county at the time Unit 5 is under development, the department might add a third shift to the Marinwood beat, thereby reducing during that shift the area of the beat that serves Bel Marin Keys. This would permit increased patrolling coverage in Bel Marin Keys during late evening hours.(2)

The marina is not expected to result in significant demand for police services. Theft is the most common police problem associated with marinas. Yet, the experience of police departments indicates that marinas generate relatively few service calls. The Unit 5 marina might result in about four calls per month, on average, based on the characteristics of marinas in San Rafael and Sausalito.(3) Certain design features of the marina, such as controlled access to the finger piers, could reduce the incidence of crime. The proposed restaurant overlooking the marina could also have an effect on reducing thefts by creating more activity in the area during the evening.

In general, the marina should not have a major effect on police services to Unit 5. There would be no significant differences among the alternatives with respect to the marina.

The cost of providing sheriff department services to accommodate Unit 5 is estimated in Exhibit E-22. The estimates assume annual expenditures equivalent to $50 per capita (in 1981 dollars). This is slightly less than the countywide average annual expenditure to account for the lower costs of providing department services to eastern county areas. Sheriff costs for west Marin tend to be higher because of the larger service area and sparse population.(4)

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(1) This officer-per-thousand ratio is based on the number of sworn personnel in the patrol and investigations divisions of the sheriff's department.

(2) Robert Gaddini, March 17, 1982.

(3) Jerry Souza, Captain, San Rafael Police Department, telephone conversation, April 8, 1982; Sandy Simpson, Crime Prevention Specialist, Sausalito Police Department, telephone conversation, April 7, 1982.

(4) Robert Gaddini, March 17, 1982.

EXHIBIT E-22

EFFECT OF UNIT 5 ON SHERIFF DEPARTMENT COSTS: 1995
(Constant 1981 Dollars)

Alternative	Annual Expenditures: Unincorporated Bel Marin Keys	Annual Expenditures: Incorporated Bel Marin Keys
A/B/C	155,600	-0-
D/E	150,800	-0-
F	-0-	-0-

Source: Recht Hausrath & Associates estimate.

Exhibit E-22 shows that the annual cost for sheriff department services would be nearly the same for all alternatives except alternative F (no project).

The lower density alternatives (A/B/C) would result in slightly more expenditures due to the higher population.

Street Maintenance. Unit 5 would result in additional street maintenance responsibilities for the county public works department. The lower density alternatives (A/B/C) would add about 4.1 miles of public streets, approximately doubling the amount of public streets in Bel Marin Keys. The higher density alternatives (D/E) would add about 2.6 miles of public streets.

The public works department would be responsible for cleaning the streets, performing minor street repairs, clearing catch basins and storm drains, and maintaining any street landscaping. These tasks would constitute the majority of street maintenance functions for the first 15-20 years of the life of streets in Unit 5.(1) Then, the streets would probably require more substantial maintenance efforts such as a chip seal or overlay.

(1) Mario Balestrieri, Chief Deputy Director, Marin County Public Works Department, personal conversation, March 30, 1982.

The costs for routine street maintenance due to Unit 5 would average about $2,400 per mile per year in 1995, in 1981 dollars.(1) Exhibit E-23 summarizes the annual street maintenance costs for Unit 5. The lower density alternatives (A/B/C) would result in annual street maintenance costs of nearly $10,000, about 60 percent higher than the annual costs with the higher density alternatives.

EXHIBIT E-23

EFFECT OF UNIT 5 ON COUNTY STREET MAINTENANCE COSTS: 1995
(Constant 1981 Dollars)

	Annual Expenditures	
Alternative	Unincorporated Bel Marin Keys	Incorporated Bel Marin Keys
A/B/C	9,800	-0-
D/E	6,200	-0-
F	-0-	-0-

Source: Recht Hausrath & Associates estimate.

General Administration and Planning. Unit 5 is unlikely to have a significant effect on general administration and planning services provided by Marin County. Any effect on countywide administrative functions due to the relatively small population added by Unit 5 should be negligible. The county would provide planning and inspection services during the development of Unit 5, and occasional planning services (associated with zoning variances and building and use permits) after the development is complete. Yet, these planning services are usually financed by applicant fees. Consequently, it is likely there would be no real costs due to Unit 5.

(1) Mario Balestrieri, Chief Deputy Director, Marin County Public Works Department, personal conversation, March 30, 1982.

Summary, County Services. Exhibit E-24 summarizes the estimated cost of providing county services to Unit 5 if Bel Marin Keys remains unincorporated. Annual expenditures with the lower density alternatives would be about 5 percent more than the costs with the higher density alternatives.

EXHIBIT E-24

EFFECT OF UNIT 5 ON COUNTY SERVICES
(UNINCORPORATED BEL MARIN KEYS): 1995
(Constant 1981 Dollars)

	Annual Expenditures		
	Alternatives		
Service	A/B/C	D/E	F
Police	155,600	150,800	-0-
Street Maintenance	9,800	6,200	-0-
Administration/Planning	-0-	-0-	-0-
TOTAL	165,400	157,000	-0-

Source: Recht Hausrath & Associates estimates.

Services Provided by Incorporated Bel Marin Keys

If Bel Marin Keys incorporates, the city would be responsible for services now provided by Marin County. Police, street maintenance, and administrative/planning services would be performed by city employees or by contracts with other public agencies or private companies.

The cost for these services would probably differ depending on whether the city established its own service departments or contracted for the same functions. This analysis assumes that, where possible, the city would provide contract services. It is assumed police, street maintenance, and some administrative/planning services would be performed under contracts. The costs for these services would likely be higher if the city established its own fully-staffed and equipped departments.

A basic premise of this analysis is that incorporation of Bel Marin Keys, if approved, would occur independent of Unit 5. It is assumed incorporation would take place before Unit 5 is fully developed. The new city's administrative structure would be established and operating. Basic administrative functions would be performed by city staff (including, for example, city council, city manager, finance director, and clerical personnel). Legal, engineering, and planning services are assumed to be provided by contracts.

Police. The city would contract for police services with Marin County or the City of Novato. Based on discussions with county and city officials, it is assumed annual contract police costs would be roughly equivalent, at about $55 per capita, in 1981 dollars.(1) This estimate includes a 10 percent overhead for administration of the contract services.

The characteristics of Unit 5 police demand were described in the section on services provided by Marin County. The marina is not expected to have a significant effect on police services. It is likely that any minor police expenses necessary to serve the marina would be accounted for using the per capita cost estimate.

The annual costs for providing contract police services to Unit 5 are shown in Exhibit E-25. The lower density alternatives would result in higher costs.

EXHIBIT E-25

EFFECT OF UNIT 5 ON POLICE SERVICES -
INCORPORATED BEL MARIN KEYS: 1995
(Constant 1981 Dollars)

Alternative	Annual Expenditures
A/B/C	$171,100
D/E	165,800
F	-0-

Source: Recht Hausrath & Associates estimate.

(1) Novato is currently evaluating city service expenditures with CRIS, a computer fiscal model. The outcome of the CRIS analysis could affect the estimate used in this report, although this is not certain.

Street Maintenance Contract services for street maintenance could be provided by the county, Novato, or by a private company. It is assumed here that contract costs would be similar to present average county and city street maintenance expenditures, including a 10 percent administrative overhead. Thus, the annual cost of maintaining public streets in Unit 5 would be about $2,600 per mile, in 1981 dollars.

The annual costs for providing contract street maintenance services to Unit 5 are shown in Exhibit E-26. The lower density alternatives would have higher annual street maintenance costs, due to their greater length of public streets.

EXHIBIT E-26

EFFECT OF UNIT 5 ON CONTRACT STREET MAINTENANCE COSTS-
INCORPORATED BEL MARIN KEYS: 1995
(Constant 1981 Dollars)

Alternative	Annual Expenditures
A/B/C	$10,700
D/E	6,800
F	-0-

Source: Recht Hausrath & Associates estimate.

Administration and Planning. Unit 5 would affect the workload of the city's administration and planning functions and result in additional service expenditures. It is assumed the city would contract for legal, engineering, and planning services. Unit 5 could be expected to increase the demand for these contract services. It is estimated Unit 5 would require additional annual expenditures of about $40,000 (in 1981 dollars) for contract legal, engineering, and planning services. This estimate is based on contract services provided in other cities, including Tiburon and Belvedere. This estimate assumes planning and building fees would finance some administrative and planning costs. The cost estimated here would be net such fees.

In addition to contract services, Unit 5 would probably affect the need for city staff and supplies. It is assumed the increased administrative workload due to Unit 5 would necessitate an additional clerk/typist or administrative assistant. Annual costs are estimated at $20,000, including benefits (in 1981 dollars). Miscellaneous additional supplies are estimated to amount to $5,000 per year.

The master plan for Unit 5 provides for a community center site. This analysis assumes that the site would be dedicated to the city and the city would construct a permanent city administrative building there. A 5,000 square foot building would provide for city offices and multi-purpose meeting rooms. Building construction costs, at $75 per square foot, would total $375,000 (in 1981 dollars). Annual building maintenance costs (for utilities and janitorial service) are estimated to be about $16,000 (in 1981 dollars).

The additional costs for the admininstrative building could be over-estimated to the extent the city eliminates or reduces other costs because of the new building. For example, if the city leases office space or a mobile home prior the construction of the new building, these lease costs would be eliminated.

On the other hand, the costs could be underestimated to the extent the building is larger than assumed here. Costs would be higher if the building included additional meeting or recreation facilities.

The effect of Unit 5 on city administrative and planning costs is shown in Exhibit E-27. It is assumed there would be no significant differences among the alternatives.

EXHIBIT E-27

EFFECT OF UNIT 5 ON ADMINISTRATIVE AND PLANNING COSTS-
INCORPORATED BEL MARIN KEYS: 1995
(Constant 1981 Dollars)

	All Alternatives*	
Function	Capital Costs	Annual Operating Costs
Contract Administration	---	$40,000
Staff and Supplies	---	25,000
Administrative Building	$375,000	16,000
TOTAL:	$375,000	$81,000

*Except alternative F (no project).

Source: Recht Hausrath & Associates estimate.

Summary, City Services. Exhibit E-28 summarizes the estimated annual costs for services provided by incorporated Bel Marin Keys. Annual expenditures for the lower density alternatives would be about 4 percent higher than the costs for the higher denisty alternatives.

All alternatives would require a capital expenditure of $375,000 for a city administrative building.

EXHIBIT E-28

EFFECT OF UNIT 5 ON ANNUAL SERVICE COSTS-
INCORPORATED BEL MARIN KEYS: 1995
(Constant 1981 Dollars)

	Alternatives		
Service	A/B/C	D/E	F
Police	171,100	165,800	-0-
Street Maintenance	10,700	6,800	-0-
Administration/Planning	81,000	81,000	-0-
TOTAL	$262,800	$253,600	-0-

Source: Recht Hausrath & Associates estimates.

Services Provided by Bel Marin Keys Community Services District

The Bel Marin Keys Community Services District (CSD) provides street lighting, park maintenance, recreation, and lagoon maintenance services to residents of Bel Marin Keys. All these services would be affected by Unit 5.

Street Lighting. The CSD contracts for street lighting services with PGandE. The utility owns and maintains the street lights in the community and charges an annual maintenance fee for this service. In 1980-81, the cost for street lighting was equivalent to about $70 per light.

Unit 5 would increase the number of street lights in Bel Marin Keys. This analysis assumes Unit 5 would have approximately the same number of street lights per mile of public street as existing Bel Marin Keys (about 30 lights per mile). This would necessitate 123 street lights for the lower density alternatives and 78 lights for the higher density alternatives.

The estimated costs for street light maintenance are shown in Exhibit E-29. The estimates assume per-light expenditures would increase 5 percent per year in real terms, reflecting the anticipated rise in future energy costs. This would result in an annual cost per light of about $140 in 1995 (in 1981 dollars).

EXHIBIT E-29

EFFECT OF UNIT 5 ON CSD COSTS FOR STREET LIGHTING: 1995
(Constant 1981 Dollars)

Alternative	Annual Expenditures
A/B/C	$17,200
D/E	10,900
F	-0-

Source: Recht Hausrath & Associates estimate.

Annual street lighting costs would be higher with alternatives A, B, and C, the lower density alternatives. The additional street lights with these alternatives would result in annual expenditures about 60 percent higher than the costs for alternatives D and E.

Parks. The master plan for Unit 5 provides for two public parks: a five acre neighborhood park and a .8-acre mini park. Other private recreation facilities would be available to the residents of the multi-family residential areas.

The county's park dedication ordinance (which governs park planning for CSDs) would require more acreage than the amount proposed for Unit 5. The ordinance would require about 14.1 acres with the lower density alternatives, and about 13.1 acres with the higher density alternatives.(1) Under certain conditions, however, the ordinance would allow open space and private park areas to contribute toward satisfying the acreage requirements. It may be possible, therefore, for Unit 5's lagoon and private open space to help meet the county's standard. The lagoon alone would consist of 546 acres.

This analysis assumes that if Bel Marin Keys becomes a city the park dedication requirements would be approximately the same as the county ordinance. The current park standards are fairly typical for local governments in the state, based generally on a goal of five acres per thousand residents.

Although the land for the Unit 5 parks would be dedicated by ordinance, the responsibility for constructing the facilities themselves is likely to fall on the CSD. No proposals have been made by the developer to construct the parks.

Park construction costs are estimated to average $50,000 per acre (in 1981 dollars) for the facilities anticipated in Unit 5. This would result in total construction costs of $290,000. It is assumed the amount of park acreage (and park construction costs) would be the same for all alternatives.

The CSD currently maintains about 1.3 acres of parks, the median area of Bel Marin Keys Boulevard, and the grounds of district facilities. These services are provided under contract with a private maintenance concern.

This analysis assumes the public parks in Unit 5 would also be maintained through a contract with a private maintenance service. The annual costs for park maintenance are estimated at $4,000 per acre (in 1981 dollars). This is comparable to the annual per-acre cost of maintaining similar park facilities in Mill Valley, where park maintenance is provided by contract service.(2) Under these conditions, total annual maintenance costs for 5.8 acres of parks in Unit 5 would be $23.200 (in 1981 dollars).

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(1) Marin County Ordinances, Title 20, Subdivisions, Chapter 20.15.080.

(2) Don Hunter, City of Mill Valley, telephone conversation, April 7, 1982.

Recreation. The CSD sponsors one recreation class, and rents its facilities for other recreational and community functions. The recreational program of the CSD is fully funded by user fees. Currently, there are no plans to expand the CSD recreation program.(1)

Unit 5 could increase the demand for CSD-sponsored recreation activities. The analysis assumes that any recreation classes or programs provided to serve Unit 5 residents would be financed by user fees. There would be no real impact on the CSD.

Lagoon Maintenance. Unit 5 would include 546 acres of lagoons, more than doubling the lagoon area of Bel Marin Keys. The development would also include a boat lock to permit access from the lagoons and marina to Novato Creek and San Pablo Bay. The CSD would be responsible for maintaining the lagoons and boat lock. The Unit 5 developer would construct the facilities.

The major maintenance function associated with the lagoons is dredging sediment deposited from inflow from Novato Creek. The existing lagoons have not been dredged since 1973. The water quality of the lagoons is maintained by periodic flushing.

The amount of sediment deposited in the lagoons is largely dependent on the frequency and time of year flushing is conducted and the concentration of suspended sediments in Novato Creek. Sedimentation can be minimized by allowing inflow from the creek only during summer months.(2) For any particular lagoon area, the rate of sediment buildup depends on the location of intake pipes and water circulation patterns.

The effect of the Unit 5 lagoons on sediment buildup is uncertain. It is possible that the Unit 5 lagoons could improve water circulation in the southern lagoon system and reduce the need for periodic flushing to maintain water quality. On the other hand, an additional inlet source may be necessary to flush the larger lagoon area, increasing the likelihood for sediment.

No costs are estimated here for dredging Unit 5 lagoons. Although it is likely the lagoons would require dredging at some point, the timing and volume of dredging are uncertain. Dredging is likely to be a costly maintenance task, however.

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(1) Walter Robbins, Director, Bel Marin Keys CSD, telephone conversation, April 13, 1982.

(2) Michael Cheney, letter to Bel Marin Keys CSD, March 11, 1980.

The boat locks would require periodic maintenance. The facility proposed for Unit 5 would have two locks, twice the capacity of the existing lock between the main lagoon of Bel Marin Keys and Novato Creek. The CSD contracts for maintenance of the existing lock. It is assumed the maintenance of the Unit 5 locks would be performed under a similar arrangement.

The cost for maintaining the existing lock is about $14,000 per year (in 1981 dollars), not including costs for energy. With energy costs, the total annual expense for the lock is probably close to $17,000.(1)

It is assumed the cost for maintaining the Unit 5 locks would be about twice the amount for the existing lock. Although there are likely to be certain cost efficiencies for a larger lock facility, the Unit 5 locks would be operated more frequently than the existing lock because of the marina. The annual maintenance cost in 1995 would be about $40,000 (in 1981 dollars), assuming energy costs increase 5 percent per year in real terms.

Without the marina, the costs for lock maintenance are likely to be somewhat less. It is assumed that maintenance costs would be about 1.5 times the costs for the existing lock if the marina were not constructed. This is a rough approximation. Under these conditions, the annual cost in 1995 would be about $30,000 (in 1981 dollars). The estimate is shown in Exhibit E-30.

EXHIBIT E-30

EFFECT OF UNIT 5 on CSD LOCK MAINTENANCE COSTS: 1995
(Constant 1981 Dollars)

Alternative	Annual Expenditures
A/C	$40,000
B	30,000
D/E	40,000
F	-0-

Source: Recht Hausrath & Associates estimate.

(1) Assuming about one-half the CSD's utility expense is attributable to the lock.

Community Center. A community center site is designated in the Unit 5 master plan. It is assumed if Bel Marin Keys does not incorporate, the site of the community center would be dedicated to the CSD. As explained in the preceding section, a 5,000 square foot building would cost about $375,000 (in 1981 dollars). Annual building maintenance costs would be about $16,000. These costs would be the same for all alternatives.

Summary, CSD Services. The effect of Unit 5 on service expenditures of the CSD is summarized in Exhibit E-31. The costs do not include a community center. Capital expenditures for parks would be the same for all alternatives. Annual expenditures would differ among alternatives. The lower density alternatives with the marina would result in the highest annual maintenance costs. These costs do not include dredging costs for Unit 5 lagoons.

If a community center were constructed, capital costs for all alternatives (except F) would increase by $375,000 and annual operating costs would increase by $16,000. It is assumed a community center would be constructed by the CSD only if Bel Marin Keys does not incorporate.

EXHIBIT E-31

EFFECT OF UNIT 5 ON SERVICE COSTS OF
BEL MARIN KEYS CSD: 1995
(Constant 1981 Dollars)

	Alternatives			
	A/C	B	D/E	F
Capital Costs				
Park	$290,000	$290,000	$290,000	-0-
Annual Costs				
Street Lighting	17,200	17,200	10,900	-0-
Park Maintenance	23,200	23,200	23,200	-0-
Lock Maintenance	40,000	30,000	40,000	-0-
Total Maintenance	80,400	70,400	74,100	-0-

NOTE:
- Periodic dredging would be required in Unit 5 lagoons. Costs for dredging would increase total annual costs during years dredging is performed.
- Costs do not include community center. See text for explanation.

Source: Recht Hausrath and Associates estimate.

Fire Protection

Service Effects. The development of Unit 5 would have several significant effects on the Novato Fire Protection District. These effects relate to emergency response capabilities and special firefighting problems associated with the marina.

Many areas of Unit 5 would be well beyond the district's five-minute response time standard. Portions of the development located further than the standard would be the entire extended Bel Marin Keys Boulevard (the residential areas as well as the marina) and most of the southernmost residential area (proposed for single family units with alternatives A/B/C, and for multi-family units with alternatives D/E). Area 1, proposed for multi-family units under all alternatives, and Area 3, the site of the neighborhood commercial and office developments, would probably be within the five-minute standard.

With good traffic conditions between Station 4 and Unit 5, response times to the southernmost residential area would be approximately six to eight minutes. The response time to the marina would be about seven minutes. The response could occasionally be longer than these estimates, depending on traffic conditions near the Highway 101-Ignacio Boulevard interchange and access constraints at the location of the fire. For example, the fire district estimates a seven to nine minute response to the marina, illustrating the effect of possible slowing factors along the route.(1)

The proposed improvements to the Highway 101-Ignacio Boulevard interchange could reduce the fire district's response time to Bel Marin Keys and Unit 5. Preliminary plans indicate the interchange improvements might reduce the response time to Bel Marin Keys by 45 seconds or so. Even if these improvements take place (the project is likely but not certain), much of Unit 5 would still be beyond the district's five-minute standard.

Current plans of the district do not include a new station closer to Bel Marin Keys. Although the district is considering constructing a new station on Atherton Avenue near Olive Avenue, it is likely that the response time from this station to Unit 5 would be longer than from the existing Station 4. A new northern access road to Bel Marin Keys would be required to permit emergency response from the proposed Atherton Avenue station.

Development located further than five minutes from the first-response station is considered an unacceptable risk by the fire district. Several measures could reduce this risk. One would be to construct a new fire station in Bel Marin Keys or nearer to Bel Marin Keys than Station 4. At the present time, this would appear to be unwarranted given the location of the district's existing stations and the ability of Station 4 to

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(1) R. W. Beyer, Fire Marshal, Novato Fire Protection District, letter to Recht Hausrath & Associates, March 24, 1982.

adequately serve the other development in its first-response area. This might be a more reasonable alternative in the future if large-scale development occurs at Hamilton Air Force Base and access is available between Hamilton and Bel Marin Keys.

If a station is not constructed closer to Bel Marin Keys, other measures may be necessary to reduce the fire risk in portions of Unit 5. The district would probably require that structures constructed beyond the five-minute standard have fire sprinkler systems.(1) This requirement would include residential as well as commercial structures. Sprinklers would probably be necessary for all commercial structures in Unit 5, even if they are within the response standard (such as Area 3).

The marina would pose special firefighting problems for the district independent of the long response time. It is likely that a marina emergency would require more first-response firefighting personnel than Station 4 could provide. District officials estimate that an adequate response to a marina fire would necessitate six firefighters.(2) Currently, only four firefighters are routinely available at Station 4. The station staff also includes two paramedics/firefighters, but they are often busy with medical and ambulance duties. Two additional on-duty firefighters would be needed to ensure that six firefighters would always be available for a marina emergency.

The experience of other fire departments that serve marinas supports the need for six firefighters as a first-response capability. Both the Sausalito and San Leandro fire departments send two engine companies in response to service calls from their large marinas.(3) This provides for a first response of six firefighters for each marina emergency.

Specialized firefighting equipment may also be needed by the Novato Fire District to fight marina fires. This could include foam for water fires, grapling hooks, and hose siphon fittings.(4) It is possible that these items would be available at the marina on a permanent basis, provided by the marina management as part of its safety program. If so, there would be no need for the fire district to purchase supplementary equipment.

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(1) R. W. Beyer, personal conversation, March 9, 1982.

(2) R. W. Beyer, telephone conversation, April 13, 1982.

(3) Todd Smith, Fire Marshal, Sausalito Fire Department, telephone conversation, April 7, 1982; Steven Mikinka, Battalion Chief, San Leandro Fire Department, telephone conversation, April 8, 1982.

(4) R. W. Beyer, March 24, 1982.

The Unit 5 master plan shows no means of emergency access to the mitigation and natural areas on the southern and eastern borders of the development. The fire district indicates that access would be desirable to these areas to respond to grass fires, downed aircraft, or other possible emergencies.(1)

Service Costs. The fire protection district is likely to incur significant capital costs due to Unit 5 only if a fire station is needed to reduce the excessive fire risk created by long response times to portions of the development. A one-company station would require capital expenditures of about $500,000 (including the cost of constructing and furnishing the station and purchasing an engine), and annual operating expenses of about $480,000 (for an on-duty staff of four firefighters).

A new station would not be warranted in Bel Marin Keys due solely to the service demands of Unit 5. Without a new station, however, other means would be necessary to reduce the fire risk in distant portions of the development. Installing sprinklers in all structures located beyond the five-minute response capabilities of Station 4 is an alternative likely to be required by the district. If this occurs, the district would be faced with no significant capital costs due to Unit 5.

The marina would create special firefighting problems for the district. To adequately respond to marina emergencies, two additional on-duty firefighters would be needed at Station 4 to ensure that six firefighters would always be available. Adding two firefighters per shift would necessitate hiring at least six firefighters. This would result in increased annual operating expenses of about $204,000 (six firefighters @ $34,000 per year, in 1981 dollars).

It is likely that if a new fire station were constructed in Bel Marin Keys, additional firefighters would not be needed at Station 4 to serve the marina. Then, the Bel Marin Keys station would provide rapid first response service and Station 4 would provide automatic back-up assistance for a marina emergency. Thus, the additional firefighters at Station 4 would be required only if a new station is not built, and then only for the alternatives that include the marina (alternatives A, C, D, and E).

The effect of Unit 5 on capital and operating expenditures of the fire district is illustrated in Exhibit E-32. It is possible that some expenses in addition to those shown would be required for special equipment to fight marina fires. Yet, such equipment could be routine safety items provided by the marina operator. Even if the marina operator did not provide all necessary special equipment, the costs are not likely to be significant.

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(1) R. W. Beyer, March 9, 1982.

EXHIBIT E-32

EFFECT OF UNIT 5 ON FIRE PROTECTION COSTS
(Constant 1981 Dollars)

	Marina		No Marina	
	Capital Cost	Annual Operating Cost	Capital Cost	Annual Operating Cost
Fire Station Necessary, No Sprinklers in Structures Beyond 5-Minute Response	$500,000*	$480,000**	$500,000*	$480,000**
Fire Station Unnecessary, Sprinklers in Structures Beyond 5-minute Response	---	$204,000	---	---

*Assumes station @ $350,000; engine at $125,000; furnishings and supplies at $25,000.

**Assumes three captains @ $40,000; three engineers @ $36,000; seven firefighters @ $34,000; supplies and maintenance @ $14,000.

Source: Recht Hausrath & Associates estimate.

Water

Service Effects. The water supplies available to the North Marin County Water District would be sufficient to accommodate Unit 5. The district presently has available supplies amounting to about 17.5 mgd.(1) The potential capacity of the district is estimated to be about 20 mgd, assuming the volume of Stafford Lake is increased and other facilities are fully utilized.(2)

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(1) North Marin County Water District, Annual Report, 1980-81, p. 3, 11.

(2) Marin Local Agency Formation Commission, Novato Community Urban Service Area/Sphere of Influence Report: Technical Appendix, February 1982, p. 49.

Water consumption in the district is currently well below the supply limitations. The average day consumption in 1980-81 was about 7.6 mgd, less than one-half the district's capacity. Peak day consumption was about 15.7 mgd.(1)

It is expected the district will have adequate water to accommodate continued growth in its service area through the year 2000. Unit 5 would not create unanticipated needs for water. The development could be served by existing and planned water supply facilities.(2)

Water distribution facilities in the vicinity of Bel Marin Keys should be adequate to provide water to Unit 5. Presently, water is supplied to Bel Marin Keys through a 16-inch pipeline. If necessary, the district could supplement this source with water from a nearby 36-inch transmission main owned by the Marin Municipal Water District. An agreement between the districts would allow the north Marin district to use this water main to provide a metered supply for consumers in the Ignacio area, including Bel Marin Keys.(3)

It would not be necessary for the district to construct water distribution facilities to supply water to Unit 5. The installation of all distribution facilities within Unit 5 would be the responsibility of the developer.(4)

Service Costs. The capital costs of all necessary on-site infrastructure would be borne by the developer. Off-site improvements to the water distribution system would not be necessary. The development would generate connection fee revenues for the district. These revenues would contribute to future system-wide improvements to the district's supply and storage facilities.

The water district operations are supported by user fees and property tax revenues. These two sources combine to match operating expenses. User fees represent the majority of district revenues. Unit 5 would have no adverse fiscal impact on the district, since user fees would be sufficient to cover any additional operating expenses that may result.

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(1) North Marin County Water District, Annual Report, 1980-81.

(2) James D. Fritz, Chief Engineer, North Marin County Water District, personal conversation, March 3, 1982.

(3) Ibid.

(4) Ibid.

Sewage Treatment

Service Effects. The impact of Unit 5 on the Novato Sanitary District would depend on the amount and timing of other development in the service area of the Ignacio treatment plant. The planned expansion of the treatment plant would allow for an additional 5,100 residents in the service area (as well as additional commercial and industrial development). The planning for the treatment plant assumed the full capacity of the expanded facility would be reached in 1991.

The potential for additional residential development in the Ignacio service area exceeds the capacity of the expanded plant. In addition to Unit 5, about 2,600 to 3,400 housing units could be constructed in the service area given current zoning (see Exhibit E-33). This would be equivalent to an additional 7,100 to 9,100 residents. Including Unit 5, potential residential growth in the service area would be 3,800 to 4,600 units and 10,100 to 12,300 residents. The potential future population is, therefore, 5,000 to 7,200 more than the expanded plant is designed to accommodate.

EXHIBIT E-33

POTENTIAL ADDITIONAL POPULATION IN SERVICE AREA
OF IGNACIO TREATMENT PLANT

	Plans in Process*	Other Potential**	Total Potential
Developments Other Than Unit 5:			
Housing Units	1,295	1,330-2,090	2,625-3,385
Population (@ 2.7)	3,497	3,591-5,643	7,088-9,140
Unit 5:			
Population		3,100 ±	3,100 ±
Total Population	3,497	6,691-8,743	10,188-12,240

*Development plans being processed by City of Novato. Most approved.

**Probable range of development on vacant parcels based on current zoning.

Source: Mark Westfall, City of Novato Planning Department
Recht Hausrath & Associates

The plans for nearly 1,300 units are currently being processed by the City of Novato. Most of these units have been approved by the city.(1) These units would account for about 70 percent of the excess treatment capacity of the expanded plant. If all these units are built, it is unlikely there would be sufficient treatment capacity to accommodate the entire Unit 5 development. Perhaps about one-half of Unit 5 could be served by the expanded plant if no more than the "in-process" units are constructed during the next decade or so. If additional units are approved and built before construction of Unit 5 is far along, the plant would accommodate even less of Unit 5.

In general, the planned expansion of the Ignacio treatment plant will not accommodate all future growth in the plant's service area. Additional treatment capacity will be needed, probably by the early 1990s (depending on the actual pace of development in the service area). This has been anticipated by the sanitary district; the Ignacio plant expansion is designed to provide for additional modular treatment facilities.(2)

It is likely that an additional increment of treatment capacity would be needed before Unit 5 could be fully served by the district's facilities. Added capacity would be required whether or not Unit 5 is developed, however, as a consequence of other residential development allowed by current zoning. Unit 5 could have an effect on the timing and size of the future expansion needs.

The district's collection facilities would be adequate to accommodate wastewater flows from Unit 5. Additional or enlarged downstream collection facilities would not be required.(3)

The district requires that on-site wastewater collection systems needed for new development be constructed by developers. Therefore, the Unit 5 developer would be responsible for all on-site facilities, including necessary pump stations.(4)

Service Costs. Additional treatment facilities at the Ignacio plant would be needed to accommodate some portion of Unit 5 and other future developments in the plant's service area. No estimates of the costs of constructing these facilities are available. Connection fees paid by Unit 5 developers would contribute to financing the eventual cost of an expanded treatment plant or other capital requirements of the district.

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(1) Mark Westfall, Principal Planner, City of Novato, personal conversation, March 23, 1982.

(2) Joseph, March 9, 1982.

(3) Ibid.

(4) Ibid.

The sanitary district's operations are funded by user fees and property taxes. These two sources combine to match operating expenses. User fees represent the majority of district revenues. Unit 5 would generate only user fees for the district. This is because the area of the development is presently outside district boundaries, and property taxes from annexed property are not allocated to the district. Nevertheless, Unit 5 would have no adverse fiscal impact on the district, since user fees would be sufficient to cover any additional operating expenses that may result.

Flood Control

Service Effects. The development of Unit 5 would have virtually no effect on the operations of the county flood control district. The district performs no on-going services to the existing Bel Marin Keys. The maintenance of the lagoons (which serve as holding basins for storm runoff) and the storm drains in streets is the responsibility of other agencies. The district anticipates that Unit 5 would similarly require no routine flood control services.(1)

Service Costs. No flood control facilities would be needed for Unit 5, and no routine flood control services would be performed. Consequently, Unit 5 would not result in additional expenses for the flood control district.

Public Schools

Service Effects. The development of Unit 5 would result in additional students for the Novato Unified School District. Estimates of the number of students in grades K-8 and 9-12 from Unit 5 are shown in Exhibit E-34. The estimates are based on assumptions about the number of students per housing unit and reflect anticipated differences in household characteristics among the single family, townhouse/condominium, and inclusionary units. These assumptions are also shown in Exhibit E-34. The low pupil yield factors for inclusionary units are based on the recent experience of the Marin County Housing Authority.(2)

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(1) Charles Murphy, Flood Control Engineer, Marin County Flood Control District, personal conversation, March 17, 1982.

(2) Carol Troupe, Marin County Housing Authority, telephone conversation, March 15, 1982.

EXHIBIT E-34

NUMBER OF PUBLIC SCHOOL STUDENTS FROM UNIT 5: 1995

	Number of Students		
	Alternative		
Grade Level	A/B/C	D/E	F
K-8	335	280	-0-
9-12	200	165	-0-
Total	535	445	-0-

NOTE: Assumes the following student-per-household factors:

Grades K-8: .4 (Single Family)
.25 (Townhouse/Condominium)
.05 (Inclusionary)
Grades 9-12: .25 (Single Family)
.15 (Townhouse/Condominium)
.01 (Inclusionary)

Source: Recht Hausrath & Associates estimate.

When Unit 5 is fully developed, alternatives A, B, and C would result in about 535 students attending Novato schools. About 335 students would be in grades K-8, and 200 students would be in grades 9-12. The total number of students from alternatives D and E would be about 90 less. These two alternatives would result in 280 students in grades K-8 and 165 students in grades 9-12.

It is difficult to determine with certainty if the excess capacity of Novato district schools in 1995 would be adequate to accommodate the additional students from Unit 5. Enrollment forecasts indicate ample capacity through 1986. As shown in Exhibit E-35, the combined excess capacity of the district's schools is expected to approach 2,200 students in 1986.

EXHIBIT E-35

ESTIMATED ENROLLMENTS AND SCHOOL CAPACITIES,
NOVATO UNIFIED SCHOOL DISTRICT: 1986

Grade Level	Estimated Enrollment 1986	School Capacity	Excess Capacity
K-8	4,100-4,600	6,400	1,800-2,300
9-12	2,400-2,500	2,600	100-200
Total	6,500-7,100	9,600	1,900-2,500

Source: Novato Unified School District.

Although enrollment estimates have not been prepared for after 1986, district officials do not presently anticipate school capacity constraints in later years. At this time, it appears likely that district schools would be able to accommodate the number of students estimated to result from Unit 5.(1) Consequently, Unit 5 would not create a need for new school facilities.

It is possible that the capacity of individual schools could be affected by Unit 5 students. For example, if large-scale residential development were to occur on the site of Hamilton Air Force Base at the same time as Unit 5, the capacity of Hamilton School (presently a K-6 school) might be exceeded. Yet, even if this occurs, it is unlikely that new school facilities would be needed. The district's probable response would be to adjust the boundaries of school attendance areas to take advantage of excess capacity at other schools.(2)

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(1) Mobley, March 9, 1982.

(2) Ibid.

Cost Effects. Unit 5 would have no effect on school capital costs since new facilities would not be needed to accommodate additional students from the development. Unit 5 would have no real effect on operating costs of the Novato district either. The amount that can be spent per student to provide instruction and operate school facilities is limited by state law. Property tax revenues and state education grants provide the revenues to finance school operating costs. In general, the state provides funds to make up the difference between total operating costs and the amount of revenues collected from local property taxes. New housing developments and the students they generate have no real effect on school operating costs since the costs necessary to provide education to new students are roughly matched by combined revenues from the state and from local property taxes. Since Proposition 13, the majority of revenues to fund school operating expenses is derived from the state.

Summary of Service Costs

Development of Unit 5 would result in additional service expenditures for public agencies. The effects on Marin County and an incorporated Bel Marin Keys are summarized in Exhibit E-36. The effects on the Bel Marin Keys CSD and Novato Fire Protection District are summarized in Exhibit E-37.

Unit 5 would result in significantly higher expenditures for police, street maintneance, and administration/planning if these services are provided by an incorporated Bel Marin Keys instead of Marin County. The difference is largely due to administration and planning costs. The county could provide these services with a negligible effect on total costs due to efficiencies of scale. The effect on the city would be greater because of the anticipated small size of the city administration and because Unit 5 would represent such a large addition to the city's developed area and population.

Exhibit E-36 shows that the lower density alternatives would result in higher annual operating costs for either Marin County or an incorporated Bel Marin Keys.

The city would incur capital costs for an administration building/community center. If Bel Marin Keys remains unincorporated, it is assumed the CSD would construct a similar facility, not Marin County.

Exhibit E-37 shows the effect of Unit 5 on the CSD and the Novato Fire Protection District. For the CSD, capital costs would differ depending on whether the Bel Marin Keys incorporated. If Bel Marin Keys remains unincorporated, it is assumed the CSD would be responsible for constructing a community center. Capital costs would be the same for all alternatives. Annual operating costs of the CSD would differ by alternative; the lower density alternatives with the marina would result in the highest annual costs.

EXHIBIT E-36

SUMMARY OF SERVICE COSTS DUE TO UNIT 5,
MARIN COUNTY AND INCORPORATED BEL MARIN KEYS: 1995
(Thousands of Constant 1981 Dollars)

	UNINCORPORATED BEL MARIN KEYS		INCORPORATED BEL MARIN KEYS			
	MARIN COUNTY		MARIN COUNTY		BEL MARIN KEYS	
	Alternatives A/B/C	Alternatives D/E	Alternatives A/B/C	Alternatives D/E	Alternatives A/B/C	Alternatives D/E
Capital Cost	-0-	-0-	-0-	-0-	$375.0	$375.0
Annual Operating Cost	$165.4	$157.0	-0-	-0-	262.8	253.6

NOTE: There would be no additional service costs due to Unit 5 under the "no project" alternative (alternative F).

Source: Recht Hausrath & Associates estimate.

EXHIBIT E-37

SUMMARY OF SERVICE COSTS DUE TO UNIT 5,
OTHER LOCAL AGENCIES: 1995
(Thousands of Constant 1981 Dollars)

	ALTERNATIVE					
	A/C		B		D/E	
	Capital Cost	Annual Operating Cost	Capital Cost	Annual Operating Cost	Capital Cost	Annual Operating Cost
Bel Marin Keys Community Services District:						
Unincorporated Bel Marin Keys	665.0	80.4*	665.0	70.4*	665.0	74.1*
Incorporated Bel Marin Keys	290.0	96.4*	290.0	86.4*	290.0	90.1*
Novato Fire Protection District:						
Fire Station Necessary	500.0	480.0	500.0	480.0	500.0	480.0
Fire Station Unnecessary	---	204.0	---	---	---	204.0

*Not including dredging cost. Annual cost would be higher during years dredging is performed.

NOTE: There would be no additional service costs due to Unit 5 under the "no project" alternative (alternative F).

Source: Recht Hausrath & Associates estimate.

For the fire protection district, there would be no differences among the alternatives if a new station is necessary in Bel Marin Keys due to Unit 5. If a station is not necessary (because, for example, sprinklers are installed in all structures beyond the district's five-minute response standard), then the alternatives with the marina would result in similar costs, and the alternative without the marina would require no additional expenditures.

Unit 5 would result in no real cost effects for all other service districts. The user fees charged by the water and sanitary districts would cover any increased costs due to Unit 5. The county flood control district would not incur added costs due to the development. State education grants and property tax revenue would combine to match any increased operating costs of the school district.

c. Fiscal Implications

This section provides an evaluation of the fiscal implications of Unit 5 for local public service agencies. It summarizes the effects on service provision and compares the revenues generated by Unit 5 with the costs of supplying services to the development. Significant fiscal impacts are identified and mitigation measures are proposed.

The assessment considers the fiscal effects of Unit 5 if Bel Marin Keys remains unincorporated and if the community becomes a city. Most service agencies would be unaffected by incorporation.

Service Delivery Issues

Marin County. If Bel Marin Keys remains unincorporated, the county would provide police, street maintenance, and administration/planning services to Unit 5. The development would necessitate additional sheriff's department officers to maintain service quality, and would add to the public works department's responsibilities for street maintenance. Unit 5 is unlikely to have a significant effect on county administration and planning services on a routine basis.

If Bel Marin Keys incorporates, the county would not be responsible for providing these services to Unit 5. Some countywide administrative services would be provided to Unit 5 regardless of incorporation (such as the services of the assessor, auditor-controller, and tax collector), but Unit 5 should have a negligible effect on these functions.

Incorporated Bel Marin Keys. If Bel Marin Keys becomes a city, it would be responsible for police, street maintenance, and administration/planning services for Unit 5. It is assumed many of these services would be provided by contracts with other public agencies or private companies. Unit 5 would increase the demand for city services, necessitating additional contract expenses and perhaps an additional city clerk/typist or administrative assistant.

The Unit 5 master plan provides for a community center site. It is assumed a city administration building would be constructed there. This would necessitate capital expenditures by the city.

Bel Marin Keys CSD. Unit 5 would result in additional street lighting, lock maintenance, and park and lagoon maintenance responsibilities for the CSD. The district would also be responsible for constructing the parks proposed for Unit 5, and a community center if Bel Marin Keys remains unincorporated.

The amount of park acreage proposed for Unit 5 would be less than required by county standards (which govern park development in CSDs). These standards would require 13.1-14.1 acres of public parks in Unit 5. The master plan proposes 5.8 acres. It is possible Unit 5's private open space and lagoon could satisfy the county requirements.

Novato Fire Protection District. Much of Unit 5 would be located beyond the district's five-minute response standard. A new station may be required to provide adequate fire protection service to the development. Installing sprinklers in all structures beyond the response standard would obviate the need for a station.

The marina would result in special firefighting problems for the district. If a new station is not built close to Bel Marin Keys, additional firefighters would be needed at the nearest existing station to provide adequate first-response capabilities for the marina. Two additional on-duty firefighters would be required, necessitating hiring at least six firefighters.

North Marin Water District. Water supplies would be adequate to serve Unit 5. The district's existing water distribution system could accommodate the development.

Novato Sanitary District. The expanded capacity of the Ignacio treatment plant will not accommodate all future growth expected in the plant's service area. It is likely an additional increment of treatment capacity would be needed before Unit 5 could be fully served by the district's facilities. Added capacity would be required whether or not Unit 5 is developed, however, as a consequence of other residential development allowed by current zoning. Unit 5 could have an effect on the timing and size of the future expansion needs.

The district's collection facilities would be adequate to accommodate wastewater flows from Unit 5. Additional or enlarged downstream collection facilities would not be required.

Marin County Flood Control District. Unit 5 would have virtually no effect on the operations of the flood control district. No flood control facilities would be needed due to Unit 5, and no routine flood control services would be performed there.

Novato Unified School District. Unit 5 would result in additional students for the school district. The lower density alternatives would generate about 535 students in grades K-12, and the higher density alternatives about 445 students. District schools are likely to have adequate capacity to accommodate these students, although this is not certain. The capacity of individual schools (like Hamilton School) may not be adequate to accommodate all Unit 5 students, depending on other future residential developments in their attendance area. Yet, even if this occurs, it is unlikely new school facilities would be needed. The district's probable response would be to adjust the boundaries of school attendance areas to take advantage of excess capacity at other schools.

Cost/Revenue Issues

Fiscal concerns arising due to costs and revenues generated by Unit 5 are identified below. A comparison of the annual revenues and costs for Marin County and an incorporated Bel Marin Keys is shown in Exhibit E-38. A revenue and cost comparison for the Bel Marin Keys CSD and the Novato Fire Protection District is shown in Exhibit E-39. Capital costs required due to Unit 5 are summarized in Exhibit E-40.

Marin County. Unit 5 would result in substantially more revenues than costs for the county at full development in 1995. A large annual surplus would result whether or not Bel Marin Keys incorporates. The largest surplus would occur with the lower density alternatives if Bel Marin Keys remains unincorporated. This surplus would amount to $941,000 in 1995 (in 1981 dollars). The smallest surplus would occur with the higher density alternatives if Bel Marin Keys becomes a city. This surplus would amount to $803,000 in 1995. Unit 5 would be a net fiscal benefit for the county regardless of incorporation.

Incorporated Bel Marin Keys. Unit 5 would result in annual costs for the city that exceed annual revenues at full development. The annual deficit in 1995 would be $47,000 for the alternatives with the marina. The deficit would be larger for the alternative without the marina (alternative B), totaling about $77,000 in 1995.

No revenue sources would be available from Unit 5 to finance the city's capital costs for the administrative building. Real property transfer tax revenues generated by the sales of Unit 5 houses between 1985 and 1995 would be sufficient to fund about half the cost of the building, but these revenues are likely to be needed for routine city operations.

The annual deficit would result primarily because the city would receive no property tax revenues from Unit 5 under the existing county agreement governing tax allocations. It is possible, however, that once the city is established it would negotiate with the county for more favorable tax sharing conditions. All other cities in the county receive a share of increased property taxes when they annex new territory. The share is a portion of the increased taxes the county would have received if the annexed area remained unincorporated. The smallest share allocated to a city is 29 percent. If the city of Bel Marin Keys successfully negotiated for a similar share, Unit 5 would generate between $215,000 and $250,000 in property tax revenues for the city in 1995. The county's property tax revenues from Unit 5 would decline by this amount.

If incorporated Bel Marin Keys received this amount of property tax revenues from Unit 5, the development would result in an annual revenue surplus in 1995 of about $160,000 to $205,000. The smallest surplus would result from alternative B and the largest surplus from alternatives A and C. Accumulated surplus revenues could finance the cost of the administrative building several years after full development.

EXHIBIT E-38

COMPARISON OF ANNUAL REVENUES AND ANNUAL COSTS DUE TO UNIT 5, BY ALTERNATIVE, FOR MARIN COUNTY AND INCORPORATED BEL MARIN KEYS: 1995
(Thousands of Constant 1981 Dollars)

	UNINCORPORATED BEL MARIN KEYS			INCORPORATED BEL MARIN KEYS					
	MARIN COUNTY			MARIN COUNTY			BEL MARIN KEYS		
	A/C	B	D/E	A/C	B	D/E	A/C	B	D/E
Annual Revenues	1,107.5	1,029.5	966.4	936.1	887.3	803.1	216.0	186.1	206.8
Annual Costs	165.4	165.4	157.0	-0-	-0-	-0-	262.8	262.8	253.6
Surplus (Deficit)	942.1	864.1	809.4	936.1	887.3	803.1	(46.8)	(76.7)	(46.8)

Source: Recht Hausrath & Associates estimate.

EXHIBIT E-39

COMPARISON OF ANNUAL REVENUES AND ANNUAL COSTS
DUE TO UNIT 5, BEL MARIN KEYS CSD AND
NOVATO FIRE PROTECTION DISTRICT: 1995
(Thousands of Constant 1981 Dollars)

	ALTERNATIVES		
	A/C	B	D/E
BEL MARIN KEYS CSD			
Incorporated Bel Marin Keys:			
Annual Revenues	86.2	61.4	86.2
Annual Costs	80.4	70.4	74.1
Surplus (Deficit)	5.8	(9.0)	12.1
Unincorporated Bel Marin Keys:			
Annual Revenues	86.2	61.4	86.2
Annual Costs	96.4	86.4	90.1
Surplus (Deficit)	(10.2)	(25.0)	(3.9)
NOVATO FIRE PROTECTION DISTRICT			
Fire Station Necessary:			
Annual Revenues	618.1-625.0	583.1-590.0	527.3-533.1
Annual Costs	480.0	480.0	480.0
Surplus (Deficit)	138.1-145.0	103.1-110.0	47.3-53.1
Fire Station Unnecessary:			
Annual Revenues	618.1-625.0	583.1-590.0	527.3-533.1
Annual Costs	204.0	---	204.0
Surplus (Deficit)	414.1-421.0	583.1-590.0	323.3-329.1

Source: Recht Hausrath & Associates estimate.

EXHIBIT E-40

CAPITAL EXPENDITURES REQUIRED DUE TO UNIT 5
(Thousands of Constant 1981 Dollars)

	ALL ALTERNATIVES
INCORPORATED BEL MARIN KEYS	
Administrative Building	$ 375.0
BEL MARIN KEYS CSD	
If Unincorporated Bel Marin Keys:	
Parks	290.0
Community Center	375.0
Total	545.0
If Incorporated Bel Marin Keys:	
Parks	290.0
NOVATO FIRE PROTECTION DISTRICT	
If Fire Station Necessary:	
Station and Engine	500.0

Source: Recht Hausrath & Associates estimate.

If no property taxes are available to the city from Unit 5, the development would generate more costs than revenues. Unit 5 would worsen the city's fiscal position under these conditions.

Bel Marin Keys CSD. Unit 5 would result in a small annual revenue surplus for the alternatives with the marina if Bel Marin Keys becomes a city (and the city, rather than the CSD, constructs the administrative/community building). For these alternatives, the surplus would be about $6,000 to $12,000 in 1995. The alternative without the marina would result in an annual deficit of $9,000 in 1995.

The revenue surplus with alternatives A, C, D and E would not be sufficient to finance the cost of constructing public parks in Unit 5. Other methods would be necessary to pay for the parks. One possible source of funding would be an assessment district. The CSD is investigating this technique to finance services for Unit 4.

If Bel Marin Keys remained unincorporated (and the CSD constructed and operated the administrative/community building), all alternatives would result in annual deficits. This would be due to the costs of maintaining the building. There would be no revenues available from Unit 5 to finance the construction of the building, however. Similarly, there would be no revenues to pay for the construction of Unit 5 parks.

The cost estimates in Exhibit E-39 do not include periodic dredging of the Unit 5 lagoons. It is uncertain when such dredging would be needed and how much it is likely to cost. Yet, the CSD's small revenue surplus from Unit 5 under certain conditions would probably not be adequate to pay for dredging in any one year. Consequently, it is likely dredging costs could not be funded from Unit 5 revenues. Other means, such as special assessments, would be necessary to pay for dredging when it is required.

Novato Fire Protection District. Unit 5 would generate annual revenues that exceed by a sizable amount the costs required for annual fire district operations affected by the development. The annual surplus would be largest if no fire station is needed, ranging from about $325,000 (alternatives D/E) to about $585,000 (alternative B). The annual surplus would be smaller if a fire station is necessary, ranging from about $50,000 (alternatives D/E) to about $140,000 (alternatives A/C).

The revenues from the district's special assessment would have only a minor effect on the surplus for most alternatives. The special assessment revenues would represent only about 2-3 percent of total revenues generated for the district by Unit 5. Consequently, sizable surpluses would still exist with alternatives A, B, and C if the special assessment is not re-approved by district voters. Repealing the special assessment would have a noticeable effect on the annual surplus only if a new station is needed with alternatives D or E. The surplus with alternatives D and E under these conditions would be reduced by about 25 percent.

The phasing of the development could affect the district's ability to finance the cost of a station with revenues from Unit 5 prior to the need for the station. If the initial development occurs within the district's response time standard from Station 4, several years of accumulated revenues would probably be sufficient to pay for a new station (there would be no annual operating expenses until the new station is constructed). The new station would then be available to serve the later development located farther than five minutes from the existing station. If the initial development occurs beyond the response standard, the district could not construct the station with Unit 5 revenues prior to the need for the station. Other revenue sources would be necessary to build the new station.

In general, the revenues from Unit 5 would be sufficient during the later phases of the development to construct and operate a new station in Bel Marin Keys, if a station is necessary. During the early phases of the development, revenues probably would not be sufficient to provide for a station.

North Marin Water District. Unit 5 would not require district expenditures for water supply or water distribution facilities. The water district operations are supported by user fees and property tax revenues. These two sources combine to match operating expenses. User fees represent the majority of district revenues. Unit 5 would have no adverse fiscal impact on the district, since user fees would be sufficient to cover any additional operating expenses that may result.

Novato Sanitary District. Additional treatment facilities at the Ignacio plant would be needed to accommodate some portion of Unit 5 and other future developments in the plant's service area. No estimates of the costs of constructing these facilities are available. Connection fees paid by Unit 5 developers would contribute to financing the eventual cost of an expanded treatment plant or other capital requirements of the district.

The sanitary district's operations are funded by user fees and property taxes. These two sources combine to match operating expenses. User fees represent the majority of district revenues. Unit 5 would generate only user fees for the district. This is because the area of the development is presently outside district boundaries, and property taxes from annexed property are not allocated to the district. Nevertheless, Unit 5 would have no adverse fiscal impact on the district, since user fees would be sufficient to cover any additional operating expenses that may result.

Marin County Flood Control District. No flood control facilities would be needed for Unit 5, and no routine flood control services would be performed. Consequently, Unit 5 would not result in additional expenses for the flood control district. Since the district would receive property tax revenues from Unit 5, the development would be a net fiscal benefit for the district.

Novato Unified School District. Unit 5 would have no effect on school capital costs since new facilities would not be needed to accommodate additional students from the development. Unit 5 would have no real effect on operating costs of the Novato district either. In general, the state provides funds to make up the difference between total operating costs and the amount of revenues collected from local property taxes. New housing developments and the students they generate have no real effect on school operating costs since the costs necessary to provide education to new students are roughly matched by combined revenues from the state and from local property taxes. Since Proposition 13, the majority of revenues to fund school operating expenses are derived from the state.

Differences Among Alternatives

The fiscal differences among the alternatives vary by public agency. In general, however, the lower density alternatives with the marina would have better fiscal consequences than the other alternatives. There are several exceptions to this general conclusion. For example, the higher density alternatives with the marina would be fiscally better than other alternatives for the Bel Marin Keys CSD. However, the difference between the high and low density alternatives with the marina would be small for the CSD. The differences among the alternatives for the various agencies are described below.

For Marin County, the lower density alternatives with the marina would generate the largest annual revenue surplus. The higher density alternatives would result in the smallest annual surplus.

For an incorporated Bel Marin Keys, the alternative without the marina would result in the largest annual deficit. Without the marina, the city's important sales tax base would be significantly smaller. There would be no net fiscal differences among the alternatives with the marina. The annual deficit would be approximately equal for these alternatives.

For the Bel Marin Keys CSD, the alternatives with the marina would be fiscally better than the alternative without the marina. The CSD would lose a major source of property tax revenues if the marina were not included as part of Unit 5. Among the alternatives with the marina, the higher density alternatives would be fiscally better than the lower density alternatives. Although CSD revenues would be the same for these alternatives, the higher density alternatives would require lower service costs.

For the Novato Fire Protection District, the lower density alternatives (with or without the marina) would generate a larger annual surplus than the higher density alternatives, if a fire station is necessary. The lower density alternatives with the marina would result in the largest annual surplus.

If a fire station is unnecessary, the alternative without the marina would generate the largest annual surplus for the fire district. Without the marina, additional firefighters would not be needed to provide adequate first-response service. Among the alternatives with the marina, the lower density alternatives would result in a bigger surplus.

For the county flood control district, the lower density alternatives with the marina would generate the most revenues. The higher density alternatives would result in the smallest amount of revenues. There would be no district costs associated with any alternative.

For the water, sanitary, and school districts, there would be no real fiscal differences among the alternatives. This is because revenues (from user fees for the water and sanitary districts and from state education grants for the school district) would cover any increased costs due to Unit 5.

Incorporation Issues

If current county policies regarding property tax allocations remain in effect, an incorporated Bel Marin Keys would not receive property tax revenues from Unit 5. As a consequence, annual city service costs for Unit 5 would exceed annual city revenues generated by the development in 1995.

If the new city could negotiate with the county to receive a share of the county's increased tax revenues from Unit 5, the city's share could be sufficient for the development to generate a net revenue surplus. For example, if the city's share were equal to the smallest share currently received by a city in the county when annexations occur, Unit 5 would result in an annual surplus of $160,000 to $205,000 for incorporated Bel Marin Keys in 1995. The county would continue to receive a substantial annual surplus of revenues from Unit 5 even if it shared a portion of its property tax revenues with the city.

If incorporated Bel Marin Keys could not negotiate for a share of county property tax revenues, other sources of revenue would be needed for Unit 5 to generate enough revenues to cover required service costs. Special taxes or assessments would be possible sources for additional revenue.

Despite its annual deficit in 1995, Unit 5 might provide fiscal advantages for the city in the long term. This is because the commercial and marina developments would create a sales tax base for the city and increase by a sizable amount its personal property tax base. Revenues from these sources are more likely to keep pace with inflation over time than many other revenues available to the city. Consequently, it might be to the city's advantage to reduce service standards (and service costs) to accommodate Unit 5 because it would improve the city's revenue potential in the future (compared to the city's fiscal future without Unit 5).

It should be remembered that this analysis assumed incorporated Bel Marin Keys would provide only basic services, and many of these services would be performed under contracts with other public agencies or private companies. If the city were to create its own departments to provide most services, the costs for serving Unit 5 would probably be higher than estimated here. Consequently, the annual deficits (if the county does not share property taxes with the city) would also be larger.

Comparison with County Fiscal Analysis of Bel Marin Keys

The Marin County Administrator recently prepared an analysis of the fiscal implications of incorporating Bel Marin Keys ("Fiscal Feasibility of Incorporating Bel Marin Keys," revised March 9, 1981). The analysis estimated the potential revenues and costs for a new city of Bel Marin Keys.

This section compares the assumptions used in the Administrator's report with those used in this analysis (referred to as the RHA analysis). It should be noted that the Administrator's report analyzed the effects of incorporating the existing Bel Marin Keys community and Unit 4 (under construction). RHA's analysis only considers revenues and costs from Unit 5. Thus, the reports deal with two different bases. Nonetheless, methods of estimating revenue sources and service costs common to both bases can be compared.

State Subvention Revenues. The Administrator's estimate of subvention revenue relies on an estimate of total revenues available for major state subventions, provided by the State Board of Equalization at the time the report was prepared. RHA uses more current estimates of likely revenues for each source (reflecting the proposed reductions in the governor's 82-83 budget) and makes some assumptions about the future level of funding by source.

Federal Revenue Sharing. The Administrator's report assumes that the per capita distribution of revenue sharing funds in incorporated Bel Marin Keys would be similar to that in Belvedere. The report also assumes there would be no loss of revenue sharing funds for the county.

The RHA report uses a weighted average of the per capita allocations received by each Marin County city in fiscal year 1981-82 to estimate the new city's allocation, as opposed to choosing only one city as a model. According to the formula by which revenue sharing funds are currently distributed to county governments, the shift in local tax revenue base from the county to an incorporated area would result in a reduced allocation to the county government. This reduction has been estimated in the RHA analysis.

Revenue from Local Taxes and Fees. Differences exist between the reports concerning methods used to estimate business license tax and franchise tax revenues and local fines and fees. The Administrator's report used countywide average revenues to estimate revenues from the business license and franchise taxes. The RHA analysis considers the factors that determine total revenues for each source: firms and employees (business license tax), energy consumption and prices, cable television service and receipts, and refuse collection service and receipts. Revenue estimates are based on assumptions about how these factors would be affected by development of Unit 5.

The Administrator's report estimated local revenue from fines and building permit and planning fees. These sources of revenue are not considered in the RHA analysis, because they are relatively insignificant (fines) and are assumed to largely offset processing and planning costs (fees).

Service Costs. In general, the assumptions and methods used by RHA to estimate service costs due to Unit 5 are fairly similar to those used by the Administrator in analyzing existing Bel Marin Keys. A difference does exist for street maintenance expenses. The Administrator's report assumed annual street maintenance costs would increase 5 percent faster than inflation. RHA's analysis assumes annual street maintenance costs would keep pace with, but not exceed on average, the rate of inflation. The costs of asphalt, oil, and other petroleum-based products used for street maintenance have increased faster than inflation in recent years. Yet, these products are usually a significant portion of street maintenance costs only when overlays, chip seals, or other major roadway reconditioning projects are performed. Streets in Unit 5 would probably not require such repairs until 15-20 years after they are constructed, beyond the time frame of the RHA analysis. The major component of routine street maintenance costs would be personnel expenses. These expenses are assumed to rise with inflation, remaining constant in 1981 dollars.

Summary Comparison. The implications of the differences in assumptions are as follows:

- The methodology used to estimate subvention revenue in the Administrator's report results in higher revenues for incorporated Bel Marin Keys than does the methodology used in the RHA report. The assumptions used in the RHA report concerning recent changes to subvention disbursements (reduced motor vehicle in lieu revenues and increased local fuel tax revenues) result in lower estimates of per capita subvention revenue. (The reduction in motor vehicle in lieu revenue is not offset by the SB215 increase in local fuel tax revenue).

- RHA's assumptions for estimating potential federal revenue sharing funds for incorporated Bel Marin Keys result in higher estimates of revenue than shown in the Administrator's report.

- RHA's franchise tax revenue assumptions might result in higher estimates of potential revenue for incorporated Bel Marin Keys than those used in the Administrator's report. The Administrator's report does not appear to consider PG&E franchise tax revenue (the major source of franchise tax revenue for the city).

- RHA's assumptions regarding business license taxes result in lower revenue estimates on average than the assumptions used in the Administrator's report.

- RHA's assumptions concerning service costs result in slightly lower cost estimates than the Administrator's report because of the difference in cost inflation for street maintenance.

In summary, RHA's methodology for estimating local revenues results in lower estimates of revenue from some sources, and higher estimates from others, than do the methods used by the Administrator's report. The most significant differences are the assumptions regarding available revenues for state subventions and potential PG&E franchise revenues. Overall, the RHA methodology generates somewhat higher revenues for incorporated Bel Marin Keys. RHA's methodology also results in slightly lower service costs. On balance, then, the RHA assumptions result in a slightly better fiscal position for incorporated Bel Marin Keys than do the Administrator's assumptions.

Summary of Impacts and Recommended Mitigations

This section summarizes the significant public service and fiscal impacts of Unit 5.

Marin County:

Impacts
- Unit 5 would result in additional service expenditures for the sheriff's department and public works department.
- The county would receive substantially more revenues from Unit 5 than the costs required to provide services.

Mitigations
- None required.

Incorporated Bel Marin Keys:

Impacts

- Unit 5 would result in additional expenditures for police, street maintenance, administration, and planning services. It could also result in expenditures for an administrative building.
- The city would receive less revenue from Unit 5 than the costs required to provide services or to construct an administrative building.

Mitigations

- If the city negotiated with the county for a portion of increased property tax revenues from Unit 5, total revenues could be sufficient to pay for services and an administrative building.
- Institute special taxes or assessments to finance services and the administrative building.
- If property taxes are not available to the city from Unit 5, special taxes or assessments would be required to finance services and the administrative buildings.

Bel Marin Keys CSD:

Impacts

- Unit 5 would result in additional service expenditures for street lighting, park maintenance, lock maintenance, and dredging.
- If Bel Marin Keys remains unincorporated, the CSD could be responsible for constructing an administrative/community building.
- Under certain alternatives, the CSD would receive less revenue from Unit 5 than the costs required to provide services.
- Under all alternatives, revenues would be insufficient to construct public parks and an administrative/community center.
- The amount of public park acreage proposed for Unit 5 would be less than required by county standards.

Mitigations

- Institute special assessments to finance services, parks, and administrative/community building.
- Require developer to construct parks in lieu of providing additional park acreage.
- Permit lagoons and private open space to satisfy requirements for additional park acreage, under certain conditions.

Novato Fire Protection District:

Impacts

- Response times to portions of Unit 5 would be beyond the district's five-minute standard.
- If sprinklers are not installed in all structures located farther than the response standard, a new fire station would probably be needed closer to Bel Marin Keys.
- The marina would create special firefighting problems for the fire district. If a new station is not constructed closer to Bel Marin Keys, additional firefighters would be needed to provide adequate first-response capability.
- The district's revenues from Unit 5 would be sufficient during the later phases of the development to construct and operate a new station in Bel Marin Keys, if a station is necessary. During the early phases of the development, revenues probably would not be sufficient to provide for a station.
- The proposed master plan shows no means of emergency access to the mitigation and natural areas on the southern and eastern borders of the development.

Mitigations

- Install sprinklers in all structures located beyond the district's response standard from the existing station.
- Plan development phasing so initial development is within the district's five-minute response capability.
- Provide for emergency access to mitigation and natural areas.

North Marin Water District:

Impact
- No significant impacts.

Mitigations
- None required.

Novato Sanitary District:

Impact
- Additional treatment facilities at the Ignacio plant would be needed to accommodate some portion of Unit 5 and other future developments in the plant's service area. No estimates of the costs of constructing these facilities are available.

Mitigations
- Connection fees paid by Unit 5 developers would contribute to financing the eventual cost of an expanded treatment plant or other capital requirements of the district.

Marin County Flood Control District:

Impacts
- Unit 5 would result in additional revenues for the district without requiring service expenditures.

Mitigations
- None required.

Novato Unified School District:

Impacts
- Unit 5 would result in about 445 to 535 additional students in grades K-12.
- District schools are likely to have adequate capacity to accommodate the students from Unit 5, although this is not certain.
- The capacity of individual schools (like Hamilton School) may not be adequate to accommodate all Unit 5 students, depending on other future residential developments in attendance areas.

Mitigations
- If the district's overall capacity is adequate to accommodate Unit 5 students but the capacity of an individual school is not adequate, the district could adjust school attendance areas to take advantage of excess capacity at other schools.

F. TRAFFIC AND CIRCULATION

Setting*

Highway 101 is the major route connecting the project site with the major populated areas of Marin County and job destinations in San Francisco to the south and the City of Novato and Sonoma County to the north. Highway 101 is built to freeway standards and has three lanes in each direction in the general vicinity of the site. Current commute patterns result in congestion in central Marin County on 101 southbound in the morning peak period. The congestion during the a.m. peak usually occurs from points north to central San Rafael and occasionally reaches as far north as the Rowland Boulevard interchange. During the evening peak travel period on northbound Highway 101, traffic is congested from the Paradise Drive interchange north. Traffic usually begins to thin out at the Lucas Valley Road interchange which is approximately three miles south of the Ignacio Boulevard interchange.

Highway 37 is situated to the north of the project site. Highway 37 is a four-lane expressway which connects Marin County with Napa, Sonoma and Solano counties. Its western terminus is Highway 101 and its eastern terminus is I-80. Traffic volumes on Highway 37 are relatively light, and no peak period traffic congestion occurs in the vicinity of the site.

Access from Bel Marin Keys to the regional highway network is provided by the Ignacio Boulevard interchange. This interchange, constructed in modified "diamond" configuration with a single clover leaf in the southwest sector, now experiences considerable congestion. The Ignacio Boulevard interchange is currently under design by the California Department of Transportation (CalTrans), to upgrade and improve capacity and traffic movements. The modified interchange is in the final design process and is planned to be constructed beginning in 1983[2] if funding is available (see Exhibit F-1).

The principal streets currently serving the project site are Bel Marin Keys Boulevard, Nave Drive and Ignacio Boulevard (see Exhibit F-1). Bel Marin Keys is a two-lane arterial which starts at the existing Bel Marin Keys residential area to the northeast of the site and continues to Nave Drive to the south. The roadway junction with Nave Drive is now being improved in conjunction with interchange improvements. Bel Marin Keys Boulevard has been widened between Hamilton Drive and Digital Drive to accommodate four travel lanes, although presently it is striped for two lanes.

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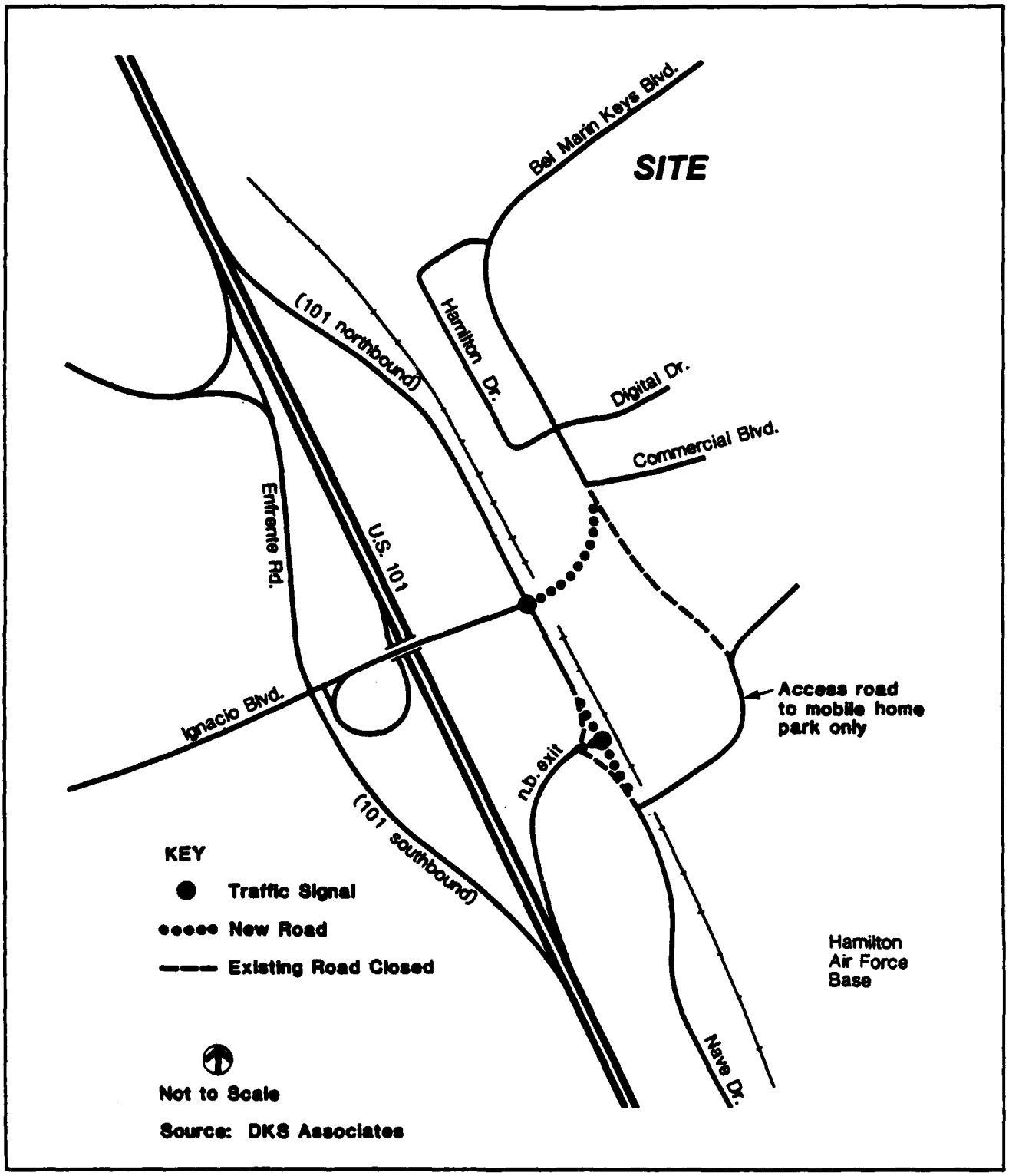
*To a large extent, the description of the traffic setting is based on the traffic report prepared by DKS.[1] The report computations, however, have been revised by the Goodrich Consulting Group. The effects of the project have been re-computed by the Goodrich Consulting Group for the Impacts section of this EIR/EIS.



TORREY & TORREY INC. 2T environmental/urban planning and design	Existing Circulation with Planned Improvements	EXHIBIT F1

Nave Drive is a three-lane arterial with two lanes northbound and one lane southbound, just south of Ignacio Boulevard.

Ignacio Boulevard starts at Nave Drive and continues to the west into the City of Novato. Ignacio Boulevard is a four-lane arterial in the vicinity of the site.

The Golden Gate Bridge District provides the nearest bus service, on Nave Drive at Bel Marin Keys Boulevard. The number 50 stops here on an hourly schedule. Six other lines on the freeway stop at the Ignacio bus pad.

Existing Traffic. Existing traffic data was collected for both a.m. and p.m. peak periods in early 1981. This data was obtained from CalTrans and the City of Novato and was substantiated via field surveys by DKS Associates and the Goodrich Consulting Group wherever necessary. The adjusted existing data was reassigned to the proposed Ignacio Boulevard interchange and is shown in Exhibit F-2.

Future Base Traffic (see Exhibit F-4). The "future base traffic" (i.e., traffic anticipated to be on these streets at the time that the project is built, but not including the project), consists of the existing traffic, plus traffic from the projects anticipated to be built just prior to the construction of Bel Marin Unit 5. Project traffic impacts are predicted using future base traffic as the base.

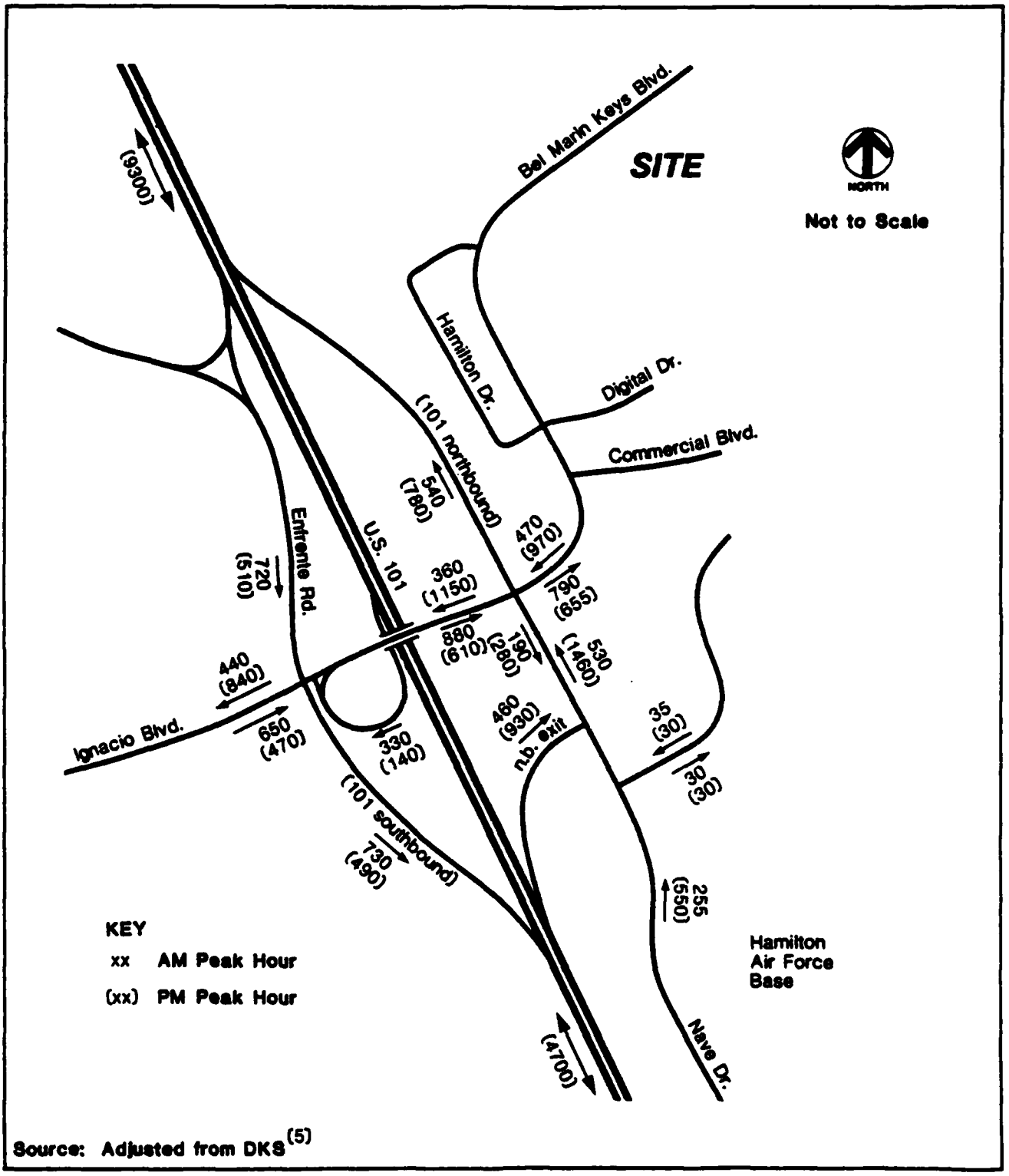
The future base traffic was based on projects anticipated in this area starting from mid-1981, and was compiled by investigating the developments which are now in the planning or construction phases. As of mid-1981, these developments included several residential developments on the west side of Highway 101, Ignacio Industrial Park Unit 3 and Bel Marin Keys Unit 4. These are listed in Exhibit F-3. The traffic associated with these developments was estimated by DKS[3] using the traffic generation rates obtained from CalTrans and from other studies of trip generation for similar land use. The directional distribution of travel was obtained from existing travel distribution for similar land uses in the area.

The distribution of future base traffic (without Bel Marin Keys Unit 5) is portrayed in Exhibit F-5.

Impacts

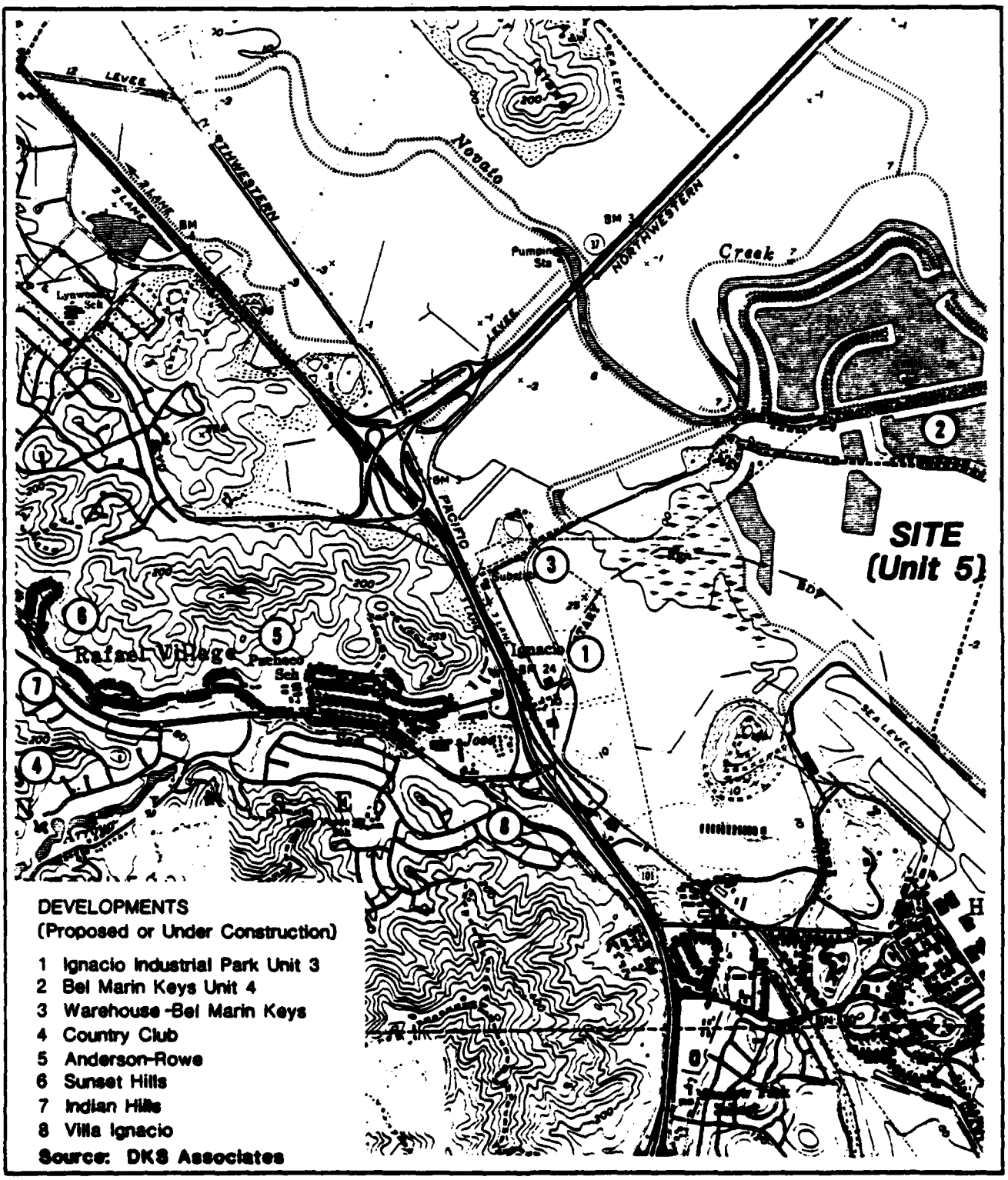
Trip Generation. The total daily traffic projected for each alternative is indicated on Exhibit F-6. These totals reflect all traffic due to the project and alternatives based on CalTrans Trip Generation rates. Some of the total traffic would remain on-site given the availability of neighborhood commercial services and the community center.

Trip Distribution. The distribution of traffic for the proposed Bel Marin Keys 5 project was based upon several field surveys of existing traffic distribution patterns by DKS Associates and the Goodrich Consulting Group. Projected a.m. and p.m. peak hour trip distribution percentages are shown in Exhibit F-7. The total volume of project traffic predicted to travel external to Bel



Source: Adjusted from DKS[5]

TORREY & TORREY INC. 2T environmental/urban planning and design	Existing Traffic on Redesigned Ignacio Blvd./U.S.101 Interchange	EXHIBIT F2



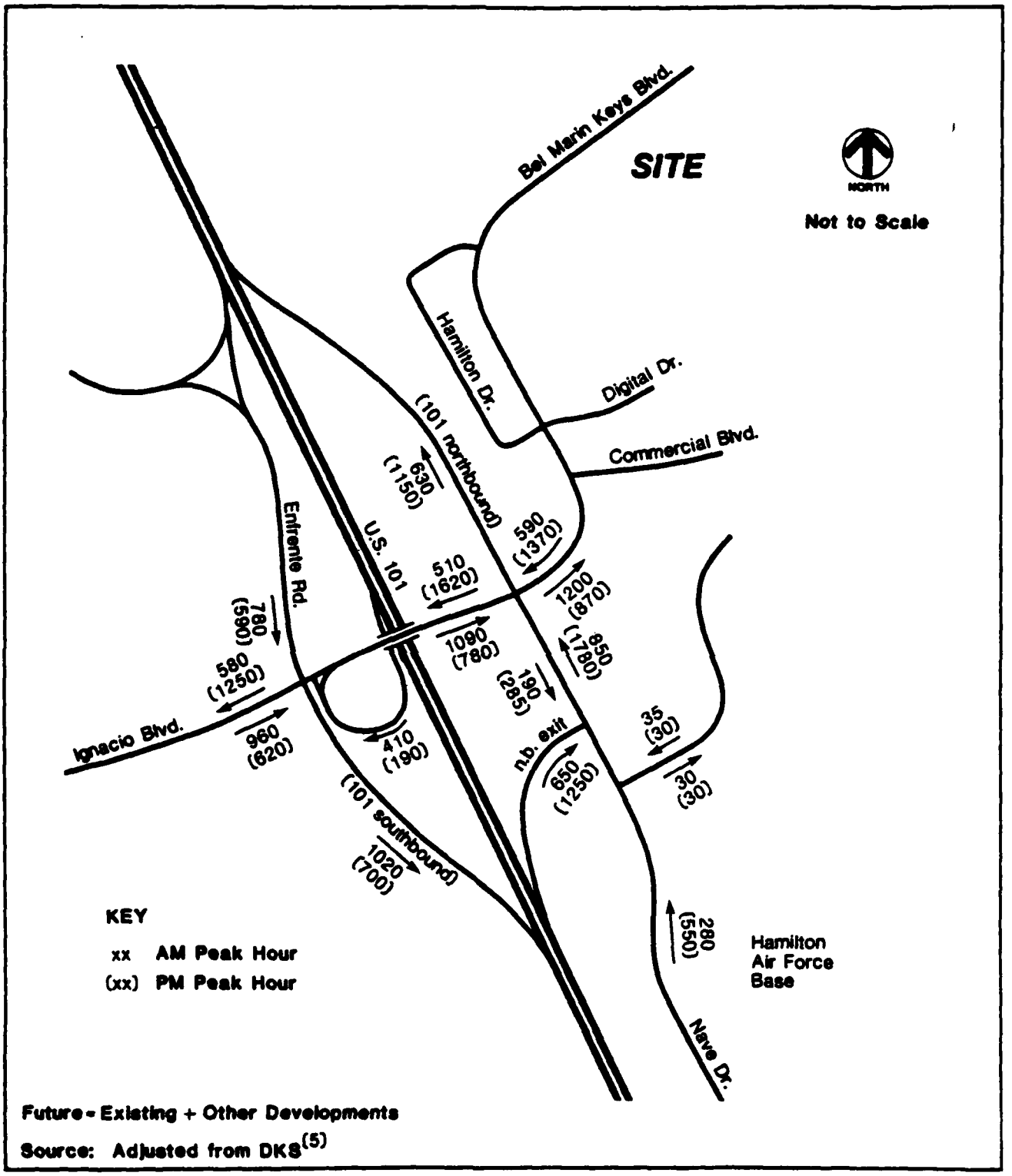
TORREY & TORREY INC. environmental/urban planning and design	Location of Future Developments	EXHIBIT F3

Exhibit F-4

Future Base Traffic

	DEVELOPMENT	ACTIVITY	DAILY TRAFFIC	PM PEAK HOUR TRAFFIC TOTAL	IN	OUT
A.	East of Highway 101					
1.	Ignacio Industrial Park Unit #3	Office & Light Industrial	5080	420	105	315
2.	Bel Marin Keys Unit #4	Residential	1260	135	95	40
3.	Warehouse/Bel Marin Keys	Light Industrial	540	45	10	35
B.	West of Highway 101					
4.	Country Club	Residential	700	70	50	20
5.	Anderson-Rowe	Residential	1920	210	145	65
6.	Sunset Hills	Residential	520	60	40	20
7.	Indian Hills	Residential	350	35	25	10
8.	Villa Ignacio	Residential	330	40	30	10
		TOTAL	10,700			

Source: DKS



Future = Existing + Other Developments

Source: Adjusted from DKS[5]

TORREY & TORREY INC. environmental/urban planning and design	Future Base Traffic Distribution without Project	EXHIBIT F5

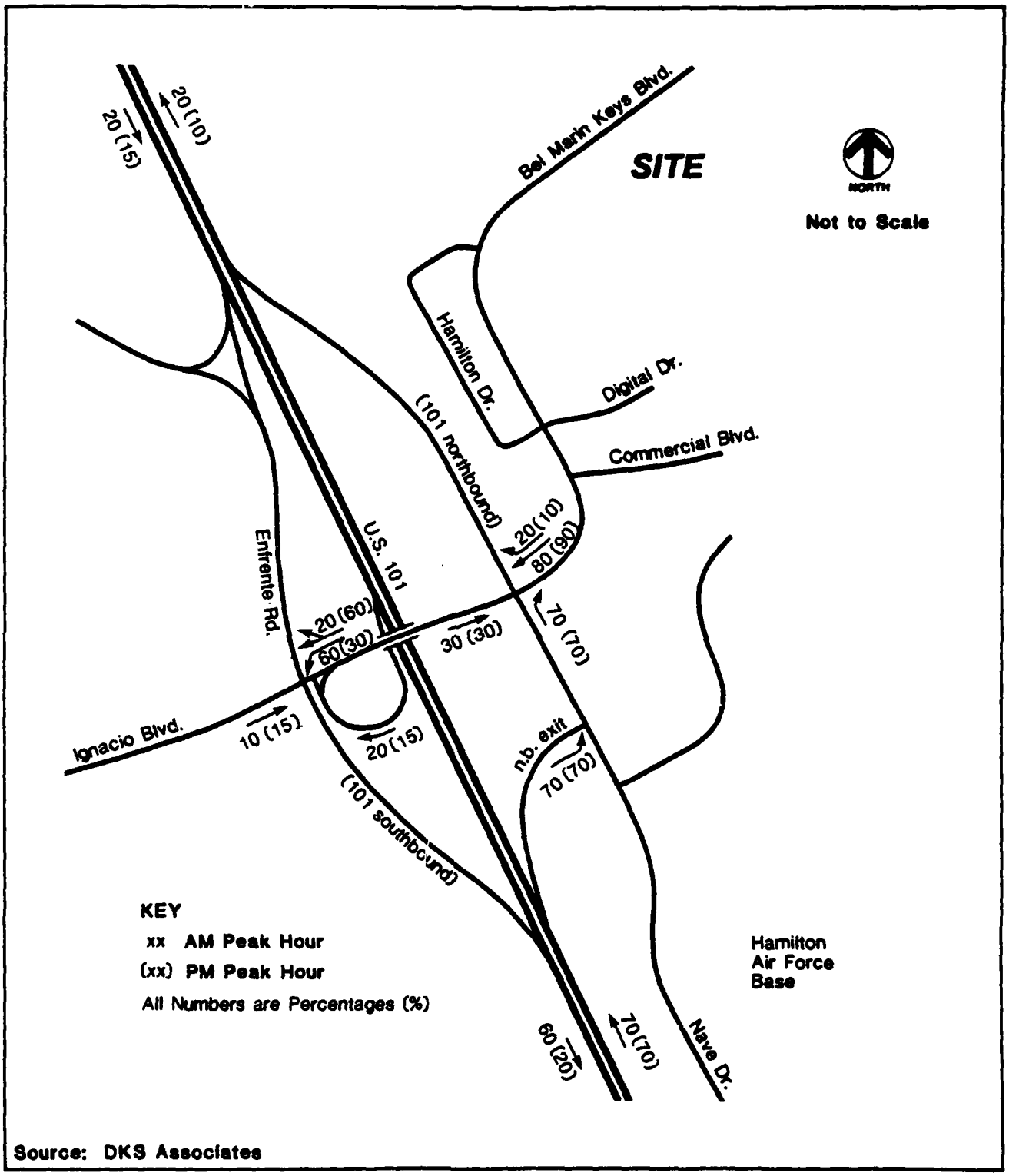
Exhibit F-6

Total Daily Traffic Projections*

Land Use	Trip Ends (TE) per Unit per Day**	Alternatives A, C # Units	Alternatives A, C # Trips per Day	Alternative B # Units	Alternative B # Trips per Day	Alternatives D, E # Units	Alternatives D, E # Trips per Day
Single-Family	10.0 TE	426	4260	426	4260	74	740
Condominium	6.5 TE	316	2054	316	2054	492	3198
Townhouse	7.5 TE	312	2340	312	2340	488	3660
Senior Citizen	3.5 TE	124	434	124	434	124	434
Marina & Support Facilities	3.8 TE/berth	602 berths	2288	0	0	602 berths	2288
Restaurant	56.3 TE/1000 ft^2	6,000 ft^2	338	6000 ft^2	338	6000 ft^2	338
Neighborhood Commercial	116 TE/1000 ft^2	34,400 ft^2	3990	34,400 ft^2	3990	34,400 ft^2	3990
Professional Office	14 TE/1000 ft^2	17,500 ft^2	245	17,500 ft^2	245	17,500 ft^2	245
Community Center	40 TE/1000 ft^2	10,000 ft^2	400	10,000 ft^2	400	10,000 ft^2	400
TOTAL DAILY TRIPS			16,349		14,061		15,293

*Assumes complete build-out
**CalTrans District 4 Trip Ends Generation Research Counts #10, 11, and 12.

Source: Goodrich Consulting Group



Source: DKS Associates

TORREY & TORREY INC. environmental/urban planning and design	Directional Distribution for Bel Marin Keys, Unit 5	EXHIBIT F7

Exhibit F-8

Off-Site Traffic Due to Project

	Daily 2-Way	A.M. Peak In	A.M. Peak Out	P.M. Peak In	P.M. Peak Out
Alternatives A, C	11,350	295	715	680	285
Alternative B*	9,760	155	705	660	215
Alternatives D, E**	10,390	190	620	590	285

*Same as Proposed Project except no Marina.

**Same as Proposed Project except replace 352 single family units with equal number of townhouses and condominiums.

Marin Keys Unit 5 (i.e., the future base traffic) is shown on Exhibit F-8. The project traffic distribution is shown on Exhibits F-9 and F-10 for the a.m. and p.m. peak hours, respectively. It should be noted that these distributed volumes would have been about 25% greater but for the proposed community center and neighborhood commercial center which will allow many project residents to remain on-site rather than drive off-site to services.

Intersection Impacts. Traffic impacts are determined by calculating the traffic to roadway capacity index. This is determined for both the future base scenario and the future base plus development. These volume to capacity ratios can be transferred into a qualitative term of Level of Service (LOS).

A LOS of A for example is smooth uninterrupted traffic flow through the intersection, whereas a LOS of E is considered to be the capacity limit of the intersection. A more detailed description of the LOS and capacity index concept is provided in Appendix II.

The LOS concept is also used in describing conditions with roadway mitigation measures. If for example, a development changes the traffic operating conditions to unacceptable levels of service, the developer can be required to mitigate these LOS changes via roadway improvements or other measures.

It was assumed for analysis purposes that the CalTrans improvements to the Ignacio Boulevard interchange were in place. Analysis done for this EIR shows that the project and other cumulative developments are dependent upon the interchange improvement. All of the predicted impacts would be much more adverse without the completion of the interchange. Levels of Service (LOS) without the interchange improvements would be so low (below F), that it would not be realistic to compute them. It should be noted however that CalTrans[1] is presently not optimistic about getting the needed federal fund contribution for this work. Should this projected funding source not be available, a local assessment district of new area projects (including Bel Marin Keys #5) might have to be formed to provide the needed financing.[5]

The before and after LOS values with and without roadway improvements have been calculated and are displayed in Exhibit F-11.

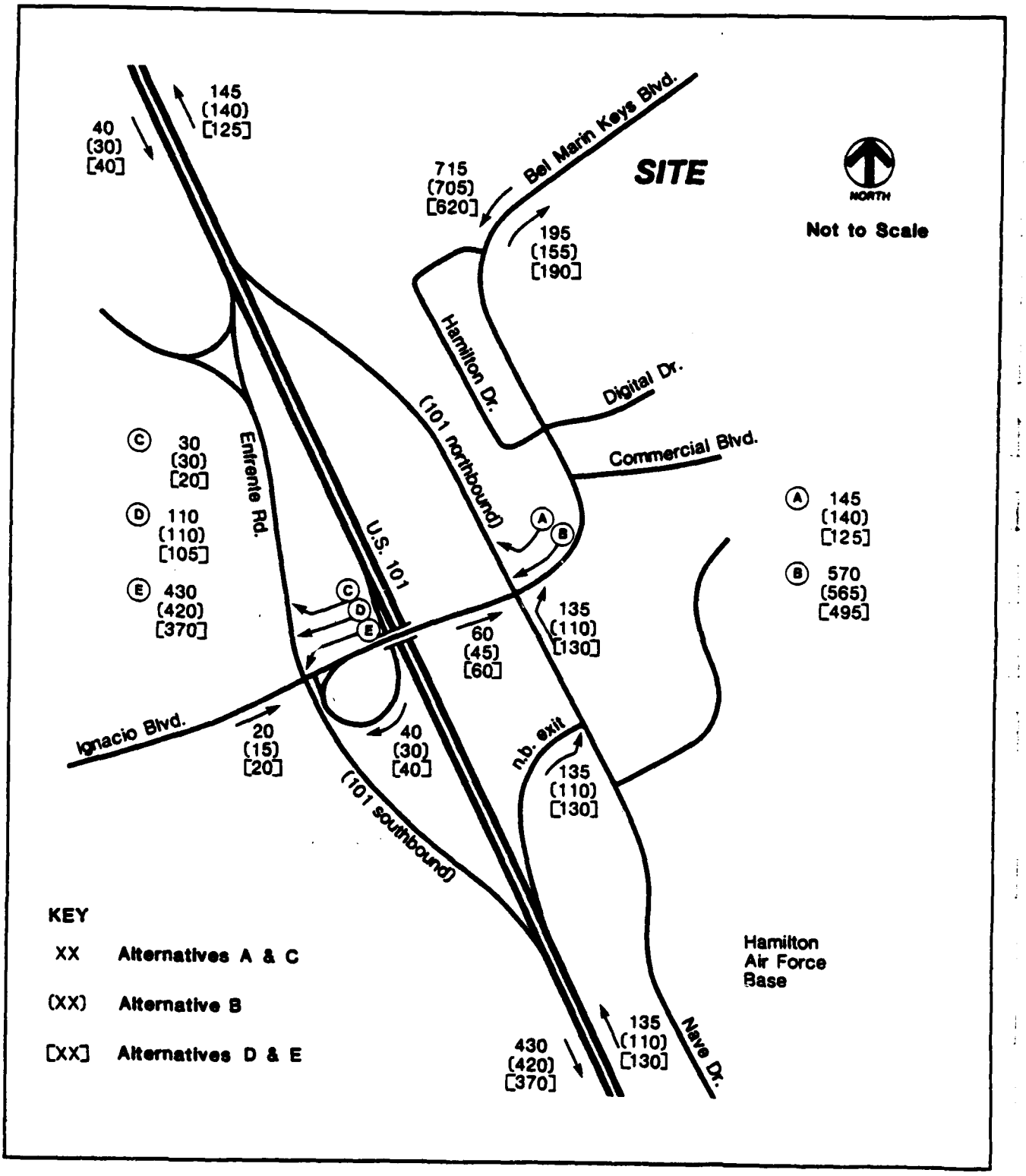
The most significant traffic impacts associated with this development are at the intersections in the vicinity of the site and at the Ignacio Boulevard/Highway 101 Interchange. The major traffic impacts will occur at the following intersections:

1. Highway 101 northbound exit ramp and Nave Drive

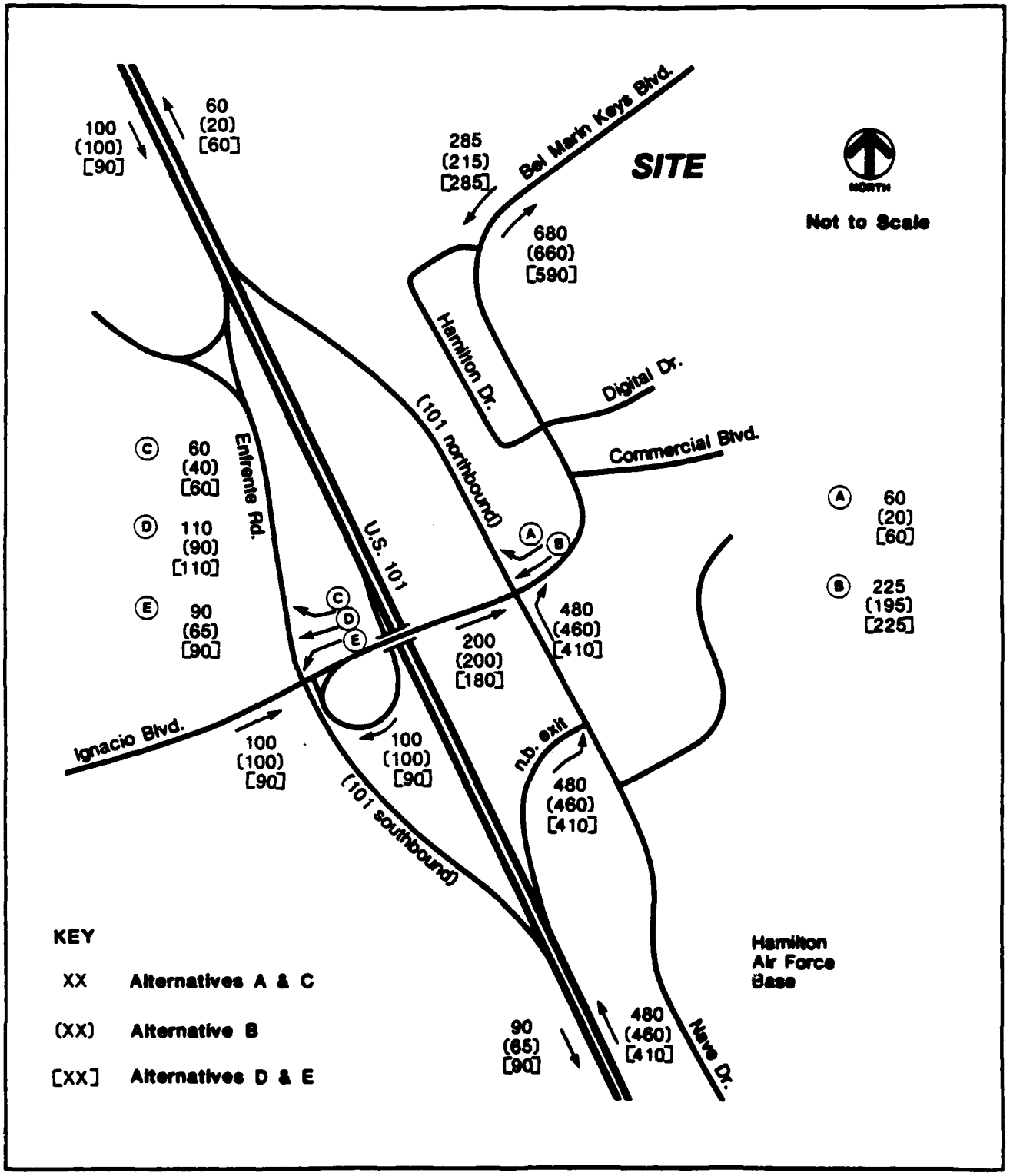
2. Bel Marin Keys Boulevard at Nave Drive/Ignacio Boulevard (new intersection)

3. Enfrente Drive and Ignacio Boulevard

The base year for this analysis is 1983 and the roadway network geometrics, as noted above, include the modified Ignacio Boulevard interchange.



TORREY & TORREY INC. 2T environmental/urban planning and design	Projected Traffic A.M. Peak Hour	EXHIBIT F9



TORREY & TORREY INC. environmental/urban planning and design	Projected Traffic P.M. Peak Hour	EXHIBIT F10

Exhibit F-11

Peak Hour Capacity Analyses for Affected Intersections*

	Area Buildout-Without Bel Marin Keys #5				Area Buildout-With Bel Marin Keys #5 Non Mitigated**				Area Buildout-With Bel Marin Keys #5-Mitigated			
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
INTERSECTION	CI[1]	LOS[2]	CI	LOS	CI	LOS	CI	LOS	CI	LOS	CI	LOS
Nave Drive/Highway 101 Northbound Off-ramp	42	A	82	C	48	A	106	E	nm[3]	nm	98	D
Bel Marin Keys Boulevard/ Nave Drive	77	B	112	E	91	D	124	F	nm	nm	105	E
Ignacio Boulevard/ Highway 101 Southbound On-off Ramps	109	E	76	B	144	F	83	C	91	D	nm	nm

[1] Capacity Index (see Appendix II)
[2] Level of Service (see Appendix II)
[3] No mitigation needed assuming the Ignacio Interchange is improved

*All figures in this exhibit assume the Ignacio interchange is improved and there is complete buildout of all projects currently planned.
**Project alternatives are indistinguishable

Source: Goodrich Consulting Group.

Intersection Capacity Impacts - A.M. Peak Hour (7-8 a.m.). During the a.m. peak period, the roadway capacity analyses indicate that major impacts due to project traffic (changes of more than 1 service level) would occur at the intersection of Ignacio Boulevard/Bel Marin Keys and Nave Drive and at the intersection of Enfrente Drive and Ignacio Boulevard.

Arriving at the new intersection of Ignacio Boulevard/Bel Marin Keys and Nave Drive, all of the morning exiting traffic will either go northbound or southbound on 101 or enter Ignacio. Project traffic should change base a.m. peak hour operation at this rebuilt intersection from LOS B to a high LOS D, which is considered acceptable in urban locations.

Sixty percent of the project vehicles leaving the area are projected to travel to the entrance ramp to southbound 101; there the vehicles will compete with eastbound traffic on Ignacio Boulevard, also entering the southbound 101 ramp (Exhibit F-9). The entrance ramp is located at the intersection of Enfrente Drive and Ignacio Boulevard. The LOS at this location would change from E to F. The roadway capacity analysis (Exhibit F-11) demonstrates that no roadway capacity will be available for the vehicles from the project intending to make a left turn onto the southbound entrance ramp.

A LOS of F would normally not be acceptable. In this situation this is an adverse impact that cannot be feasibly mitigated by physical improvements at this location to the normal degree of acceptability, because there is not enough storage capacity for westbound left turning traffic. Only the overpass is available for left turns to the west and east and the width and length of the overpass is insufficient to provide adequate storage for westbound left turning vehicles. The resulting situation will be an extension of the peak hour congestion from one hour to an hour and half or even two hours. Over time, however, drivers will adjust their travel times to relieve the situation somewhat. Other mitigations are also recommended below.

Intersection Capacity Impacts - P.M. Peak Hour (5-6 p.m.). The major roadway impacts during the p.m. peak period will occur at the intersection of the northbound Highway 101 exit ramp and Nave Drive and at the new interseciton of Ignacio Boulevard/Bel Marin Keys and Nave Drive.

Seventy percent of the vehicles entering the development will exit northbound Highway 101 at the Ignacio Boulevard interchange (Exhibit F-9). The northbound exit ramp as proposed by CalTrans provides a one lane exit from the freeway which immediately widens into two lanes and into three lanes at Nave Drive. The proposed design will facilitate access to the development. The roadway capacity analysis of this intersection demonstrates that it will operate at acceptable levels of service without Bel Marin Keys #5, but it will be operating over capacity with inclusion of project vehicles (Exhibit F-11).

At the new Ignacio Boulevard/Bel Marin Keys Boulevard and Nave Drive intersection, seventy percent of the vehicles destined to the project will turn right from Nave Drive to Bel Marin Keys Boulevard. This intersection is projected to be operating at service level E without Bel Marin Keys Unit 5

traffic. Project traffic added to other cumulative traffic would result in service level F operation (Exhibit F-11). A second concern during the p.m. peak hour is the possibility of queuing on the northbound exit ramp. The intersection of the exit ramp and Nave Drive will operate as a two phase signal and can provide sufficient green time for vehicles to exit the freeway. However, insufficient stacking space is available for the volume projected on the northbound approach to Ignacio Boulevard under the CalTrans plan.

The two-lane section of Bel Marin Keys Boulevard between the Bel Marin Keys Unit 5 project and the Hamilton drive intersection is projected to be operating over capacity during the weekday a.m. and p.m. peak commute periods with inclusion of traffic from the project.

Project traffic will add to the already congested conditions on Highway 101 during the morning and evening commute periods (a 6 percent increase in existing 2-way peak hour volumes south of Ignacio Boulevard and a 2 percent increase north of Ignacio Boulevard). The result will be longer "stop and go" backup of southbound a.m. peak hour 101 traffic and northbound p.m. peak hour 101 traffic.

Bel Marin Keys Boulevard. The two-lane portion of the existing Bel Marin Keys Boulevard up to Hamilton Drive would have insufficient capacity to accommodate project traffic during peak traffic periods. The existing capacity is about 1800 vehicles per hour (two way). This capacity would be reduced with construction of any additional development adjacent to the street. Project traffic would result in volumes 25 percent over the available capacity. This is considered to be a significant adverse impact.

Bel Marin Keys Boulevard between Hamilton and Ignacio Boulevard has the necessary capacity to accommodate project traffic, but does not have appropriate striping for four lanes. This is considered to be an adverse but not significant impact.

It should be noted that although Bel Marin Keys Boulevard was designed to accommodate the volume generated by Bel Marin Keys Unit 5, the change in traffic between present and future volumes will be perceived by the residents fronting on Bel Marin Keys as an adverse impact. This increase will be due to traffic from the 74 new single family homes (700 trips per day), and the marina (2,300 trips per weekday and 50 percent more on Sunday). This will present safety problems for pedestrians except at controlled intersections and will require a change in the manner in which the residents use the street, especially at the eastern end which is now temporarily fenced off. This is considered to be an adverse but not significant impact for Alternatives A, C, D, and E. Alternative B would result in a much smaller adverse impact, since the marina would not be included.

In summary, assuming construction of the Ignacio Boulevard interchange the off-site significant adverse impacts of the project are the following:

- a.m. peak hour operating problems with the Ignacio/southbound 101 off ramp intersection

- p.m. peak hour operating problems with the Nave Drive/northbound 101 off ramp

- p.m. peak hour operating problems at the proposed intersection of Nave Drive/Bel Marin Keys Boulevard.

- insufficient capacity on Bel Marin Keys Boulevard between the existing Bel Marin Keys neighborhood and Hamilton Drive

A comparison of impacts for the project as proposed and the project alternatives indicates that adverse impacts would be somewhat lower for Alternative B (no marina). On the whole, however, all the alternatives result in the same off-site traffic impacts.

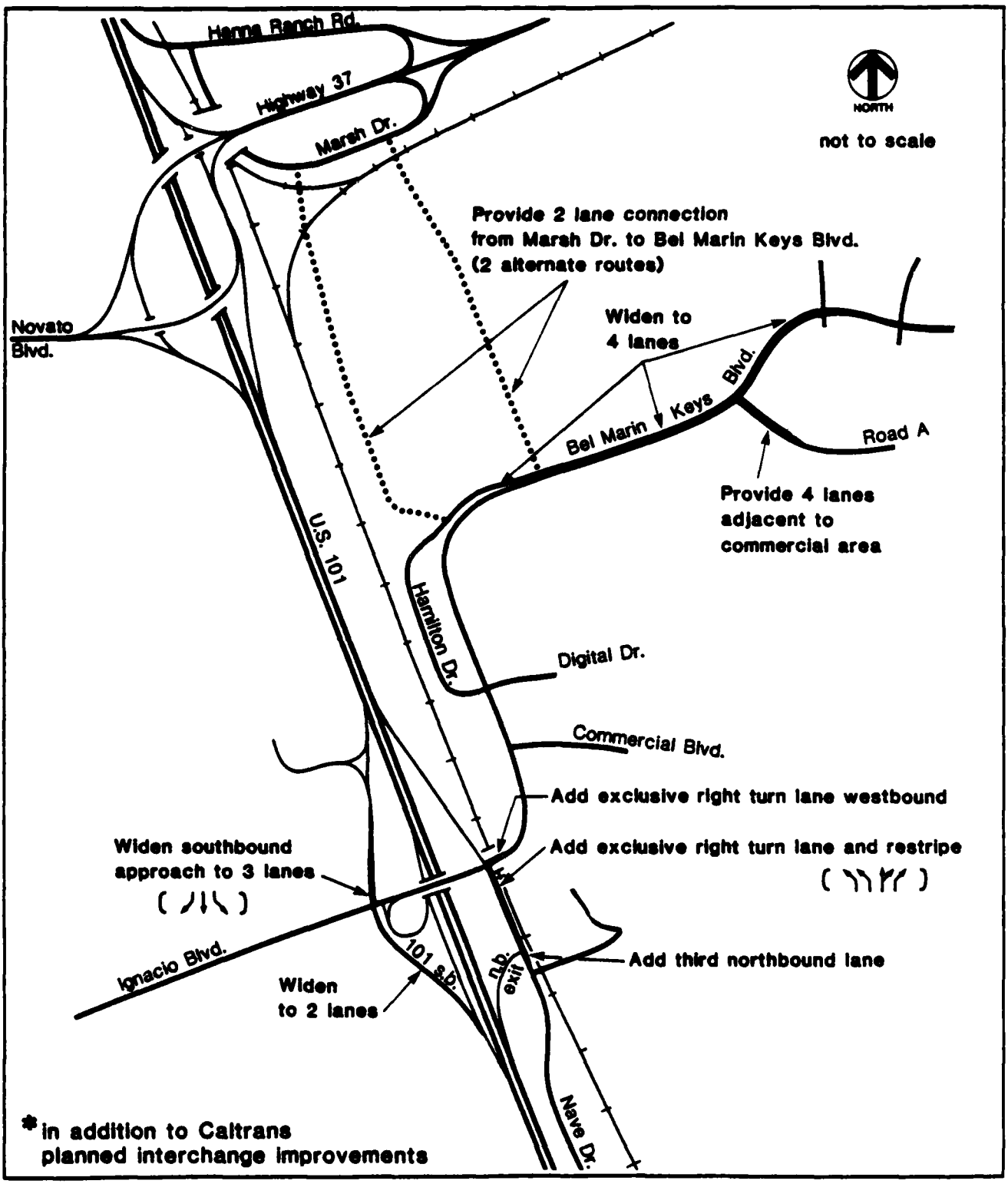
On-Site Impacts - Circulation. The main entry to Area 1 in the proposed project is located on the inside of a curve on the only arterial serving the site. This location may result in less than adequate sight distances to and from this intersection. The problem in an entry being located on an inside of a curve, is that any obstruction to view along the highway would obstruct the sight lines between the main road and the cross road. This is considered to be a significant adverse impact.

No detail is shown on the site plan indicating right or left-turn lanes on intersection approaches. The same is true for any proposed on-street parking prohibitions.

Off-Site Mitigation Measures (Exhibit F-12)

- Ignacio/southbound 101 On-off Ramp Intersection (a.m. peak hour operating problems with project) (Developer Responsibility: 50 percent of improvements). Widen the southbound on-ramp from one to two lanes from Ignacio Boulevard south for about 200 feet. Channelization should be employed at the ramp junction at Ignacio Boulevard to allow westbound left-turn and eastbound right turns to the on-ramp to occur simultaneously. This improvement would provide level of service D to E operation (from F) for the alternatives A and C and level of service D operation for Alternatives B, D, and E at this intersection during a.m. peak hour traffic with vehicles from all existing and proposed developments.

  The southbound approach to this intersection could be widened to provide separate left, through, and right turn lanes. This widening would provide almost one service level of improvement during a.m. peak hour traffic conditions. The intersection would operate at a good service level D with traffic from the proposed alternative (project), service level C to D with Alternative 1, and service level C with Alternative 2 traffic.



TORREY & TORREY INC. environmental/urban planning and design	Recommended Mitigation Measures for Traffic*	EXHIBIT F12

The westbound left-turn lane should be extended to the maximum extent possible to provide additional storage area on the Ignacio Boulevard Overpass.

- Nave Drive/northbound 101 Off-Ramp (p.m. peak hour operating problems with project) (Developer Responsibility: 50 percent of improvements). Widen Nave Drive from two to three lanes of the northbound direction from the northbound off-ramp to Bel Marin Keys Boulevard. This would improve p.m. peak hour operation to service level D conditions with traffic from the proposed project or from either of the two alternatives.

- Proposed Intersection of Nave Drive/Bel Marin Keys Boulevard (p.m. peak hour operating problems) (Developer Responsibility: 50% of improvements). Widen the northbound Nave Drive approach to Bel Marin Keys Boulevard from 3 as proposed to 4 lanes, 2 exclusive left-turn, one exclusive right-turn, and one through or optional right-turn lane. Widen the westbound Bel Marin Keys Boulevard approach from three as proposed to four lanes (one exclusive left-turn, one exclusive right-turn, and two through lanes). Both improvements above would improve p.m. peak hour operation at this intersection from service level F to service level E, with traffic from the proposed alternative or either of the two alternatives. To gain additional improvement would require widening of the Ignacio Boulevard overpass of Highway 101.

- Connection of Bel Marin Keys Boulevard to Highway 37. (Developer Responsibility) A roadway connection should be made between Bel Marin Keys Boulevard and the Marsh Drive interchange with Highway 37. (Exhibit F-12 shows 2 alternative alignments for such a connection.) This connection would act as an alternate route to and from Bel Marin Keys to the freeway network, and should attract enough traffic away from the Ignacio Boulevard interchange to allow all intersections in the interchange area to operate at service level D or better during peak traffic hours (assuming CalTrans proposed interchange improvements and recommended mitigation measures above are implemented). This connection would also provide a continuation of the frontage road on the east side of the Highway 101 that currently exists along Hamilton Air Force Base and which is projected to eventually extend northward to the Rowland interchange. The feasibility of this roadway connection should be the subject of a detailed study. A determination by the Public Utilities Commission would be required in order to cross the railraod parallel with Marsh Road. Other issues which must be addressed include purchase of right-of-way and possible Corps of Engineers jurisdiction.

- Bel Marin Keys Boulevard. The two lane portion of Bel Marin Keys Boulevard between the existing Bel Marin Keys development and Hamilton Drive should be widened to four lanes in conjunction with development of Bel Marin Keys Unit 5. Also, Bel Marin Keys Boulevard between Hamilton and Ignacio extended should be striped

to four lanes. Enough width should be included to provide bike paths on the shoulder areas. The roadway through the existing residential area fronting Bel Marin Keys Boulevard is not designed for bike lanes but such lanes could probably be added between the parking lane and the through lane. This would allow bike riders to use this long, flat road all the way to the Marina. However, bike riders would be disturbed by heavy traffic volumes on Bel Marin Keys Boulevard, for the project as proposed, and Alternatives C, D, and E.

As discussed above, if CalTrans does not proceed with the Ignacio Boulevard/Route 101 improvements, an assessment district would have to be formed, in order to provide these improvements. A theoretical assignment of project responsibility for the improvement has been made based on a percentage of total trips contributed by the project. Based on trip generation impacts of 11,300 daily trips due to the project (Exhibit F-8) and 10,700 due to other cumulative developments (Exhibit F-4), the project would be responsible for about 50% of the improvements to the interchange. The other projects in the areas would therefore be responsible for the remaining 50%.

The 50% share assigned to Bel Marin Keys unit 5 would include the cost of traffic signals at the Ignacio Boulevard intersections with the northbound and southbound freeway ramps. Depending on future traffic levels on Commercial Boulevard, its intersection with Bel Marin Keys Boulevard may also warrant signalization. During development of the project, a signal will also be warranted at the Bel Marin Keys intersection with the project road to its commercial area.

On-Site Mitigations

- The main entry to Area 1 should be moved away from the inside of a major curve on the arterial roadway accessing the site or Bel Marin Keys Boulevard should be straightened. .

- Left- and right-turn lanes should be provided on Bel Marin Keys Boulevard at all arterial access locations to Areas 1, 2, and 3.

- On-street parking should be prohibited along the arterials serving areas 1, 2, and 3. On-street parking is acceptable along the roadways serving the single family units to the west of area 1. Areas for bike paths should be provided on the edges of main roads. Sidewalks should be included on all streets.

- Transit. Since the closest bus stop to the project site is at Nave Drive, it would only serve "kiss-ride" service, which would attract a limited number of riders. Although extension of the bus route into the project would be desirable, this is not likely to happen because Bel Marin Keys would represent a destination "end" (rather than a "loop" service area). Extension of lines to "end" destination is not economical.

- Van pooling and car pooling and transit use (to the extent possible) should be promoted, however, for all project residents.

Mitigation Alternatives

Alternate access to Bel Marin Keys through Hamilton Air Force Base may be a possibility some time in the future. However, it is not possible to consider this connection at this time due to the uncertain nature of future uses on the Hamilton property.

Footnotes

[1]DKS, "Traffic Impact Study and Roadway Improvement Measures for Bel Marin Keys Unit 5," March 1981.

[2]Mr. Bob Crockett, CalTrans, District 4.

[3]DKS, "Traffic Impact Study and Roadway Improvement Measures for Bel Marin Keys Unit 5," March 1981.

[4]Mr. Bob Crockett, CalTrans, District 4.

[5]Mr. Tom Nolan, Novato Assistant City Engineer.

[6]DKS, "Traffic Impact Study and Roadway Improvement Measures for Bel Marin Keys Unit 5," March 1981.

G. AIR QUALITY

Setting

The project site is located on the west shore of San Pablo Bay, but is partially sheltered from the main marine airflow over San Pablo Bay by higher terrain. Wind records at Hamilton Air Force Base show that winds tend to blow along a northwest-southeast axis. Calm days are relatively frequent, occurring about 29% of the time. Because of its sheltered location and the frequency of calm days, the air pollution potential of the project area has been termed "high."[1]

The Clean Air Act of 1967, as amended, established air quality standards for several pollutants. These standards are divided into primary standards, which are designed to protect the public health; and secondary standards, intended to protect the public welfare from effects such as visibility reduction, soiling, nuisance and other forms of damage. In addition, the State of California has adopted its own standards.

Despite a high potential for air pollution, air quality in the project area is generally good due to the lack of upwind pollution sources. Data for San Rafael, the closest monitoring site, shows that the federal standards for ozone, nitrogen dioxide, sulfur dioxide and total suspended particulates were not exceeded in 1979 or 1980. The state 24-hour standard for total suspended particulates was exceeded on one day in both 1979 and 1980.[2]

With the exception of carbon monoxide data, the above information is representative of air quality near the site. Carbon monoxide is a localized pollutant generated by automobiles. Estimates of on-site carbon monoxide levels, based on traffic conditions and volumes on nearby streets, are presented below.

Regional Air Quality Planning

The San Francisco Bay Area has been designated as a region where three national ambient air quality standards are being exceeded. Under the 1977 Clean Air Act, the Association of Bay Area Governments (ABAG) was empowered to prepare a non-attainment plan for oxidant, carbon monoxide and total suspended particulates. The entire Bay Area is considered a non-attainment area for ozone.

The 1979 Bay Area Air Quality Plan is the non-attainment plan for meeting the federal standards for oxidant, carbon monoxide and total suspended particulates. It is to be included in a State Implementation Plan (SIP) and approved by the Environmental Protection Agency.

BAAQP contains analysis and projections of air quality and emissions. Strategies for improvement are also evaluated within the Plan. The Plan includes selected stationary source controls, mobile source controls and transportation controls designed to attain and maintain the Air Quality Standards in the Bay Area. The Plan is required to show attainment of the standards by no later than 1987.

Impacts

Temporary Effects. All alternatives except Alternate F (No Project) would generate pollutants during construction. Trucks and equipment exhausts would contain hydrocarbons, oxides of nitrogen, carbon monoxide and particulates. Wind blown dust generated by excavation and grading activities would be even more important. The impact of the above emissions would vary day to day and by location. Concentrations nearby may be sufficient to cause occasional annoyance, and increased dustfall would require more frequent cleaning of exterior and interior surfaces.

Wetting the surfaces of unpaved access roads is an effective control for dust emissions provided the surface is maintained wet. In an arid climate such as that of Marin County in summer, an appreciable amount of water is required. Most of the excavated materials will already be wet due to the excavation to levels which approach ground water or which collect surface runoff. Therefore, wetting of these disturbed soil surfaces will probably not be necessary.

Local Effects. The project would act as an indirect source of pollutants in that it would attract automobile traffic and would redistribute traffic and emissions along city streets. On the local scale, carbon monoxide is the pollutant of greatest importance. Carbon monoxide impacts near the project site have been estimated using a line-source air quality model developed by the Bay Area Air Quality Management District.[3] This model uses peak 1-hour and 8-hour traffic volumes and emission factors based on vehicle speed and year. Vehicle speeds for this analysis are assumed to be 10 mph for the peak hour and 20 mph for the peak 8-hour traffic period. Cumulative traffic increases due to anticipated development in the area are also included.

Carbon Monoxide levels are predicted at the intersections affected by project traffic. Worst-case assumptions include peak traffic low temperatures (35°F) and light winds. Emission factors were developed by the California Air Resources Board.[4] Background levels were taken as 4 ppm for the 1-hour averaging time and 3 ppm for the 8-hour averaging time.

Predicted worst-case carbon monoxide levels with the project alternatives are shown in Exhibit G-1. Alternatives A-E all result in a higher carbon monoxide concentration, although the standards are not approached in any single case. For Alternative F, improvement in carbon monoxide levels would be expected due to increased effectiveness of emission controls in the future.

The closest sensitive receptors to the streets affected by project traffic are the mobile home residences along Bel Marin Keys Boulevard. Carbon monoxide levels at these residences would be below the curbside levels shown in Exhibit G-1.

The roadway and signal improvements recommended in the transportation section of this report would all act to improve traffic flow. They would increase traffic speeds, reducing carbon monoxide concentrations. No additional mitigations should be necessary.

Exhibit G-1

Estimated Worst-Case Curbside Carbon Monoxide
Concentrations Near Project
(Parts per Million)

Intersection	Peak 1-hour Period (standard is 35 ppm)			Peak 8-hour period (standard is 9.3 ppm)		
	Existing (1982)	Alternatives A-E (1985)	Alternative F (1905)	Existing (1982)	Alternatives A-E (1985)	Alternative F (1985)
Nave Drive/ U.S. 101 Offramp	13.9	15.4	12.9	5.0	5.3	4.8
Bel Marin Keys/ Nave Drive	21.3	25.0	20.6	6.4	7.2	6.3
Enfrente Drive/ Ignacio Boulevard	13.1	14.2	12.9	5.4	5.6	5.4

Regional Analysis

Regional impact is related to the Vehicle Miles Travelled (VMT) generated by autos associated with the project. Alternatives A, C, D, and E would generate about 13,000 trips, Alternative B would generate about 10,700, and Alternative F would generate none. Based on assumptions of an average trip length of 7 miles and an average vehicle speed of 35 mph, the resulting VMT and total regional emissions are shown in Exhibit G-2.

Exhibit G-2

Regional Auto Emissions[5]

Alternative	VMT	Regional Emission (pounds/day)			
		Non-methane Hydrocarbons	Oxides of Nitrogen	Sulfur Dioxide	Suspended Particulates
A, C, D, E	91,000	267	462	48	80
B	74,900	219	380	39	65
F	0	0	0	0	0

The effect of these regional emissions for Alternatives A-E would be a degradation of air quality, particularly in the North Bay. The magnitude of this degradation would not be measurable at North Bay air monitoring sites; however, as project emissions amount to less than a 0.04% increase in regional emissions. Nevertheless, the scale of the project and the magnitude of its trip generation render it a major indirect source of emissions.

The 1979 Bay Area Air Quality Plan contains actions and policies designed to result in the attainment and maintenance of the air quality standards. Strategies include new controls on stationary and mobile sources, and transportation controls. The plan contains no land use provisions.

A review of the proposed control measures reveals no conflicts between the plan and the project. The project would become more consistent with the plan, however, with the inclusion of transit, car pool/van pool and bicycle incentives or programs within the project.

Mitigation Measure and Mitigation Alternatives

- (Developer Responsibility) If dust becomes a problem during construction, 0.5 gallons of water per square yard of earth surface should be applied twice a day to the access roads, in order to suppress dust emissions by about 50%.

Mitigation Alternative

- (Joint Developer and Responsible Agencies Responsibilities) Both the regional and local impacts of the proposed project would be mitigated by reducing project trip generation. This could be accomplished by:

  a. reducing project size (Alternatives B, D, or E)
  b. improving transit access to site
  c. carpool/vanpool programs for commuters
  d. provision of bicycle paths and secure bike parking areas

Footnotes

[1]Association of Bay Area Governments, Aviation Effect on Air Quality, 1971.

[2]Bay Area Air Quality Management District, Air Currents, vols. 23-24, no. 3, 1980 and 1981.

[3]Bay Area Air Quality Management District, Guidelines for the Air Quality Impact Analysis of Projects, June, 1975.

[4]California Air Resources Board, Supplement 2 to Procedure and Basis for Estimating On-Road Motor Vehicle Emissions, June 1981.

[5]Association of Bay Area Governments, Aviation Effect on Air Quality, 1971.

[6]Association of Bay Area Governments, Aviation Effect on Air Quality, 1971.

H. NOISE

Setting

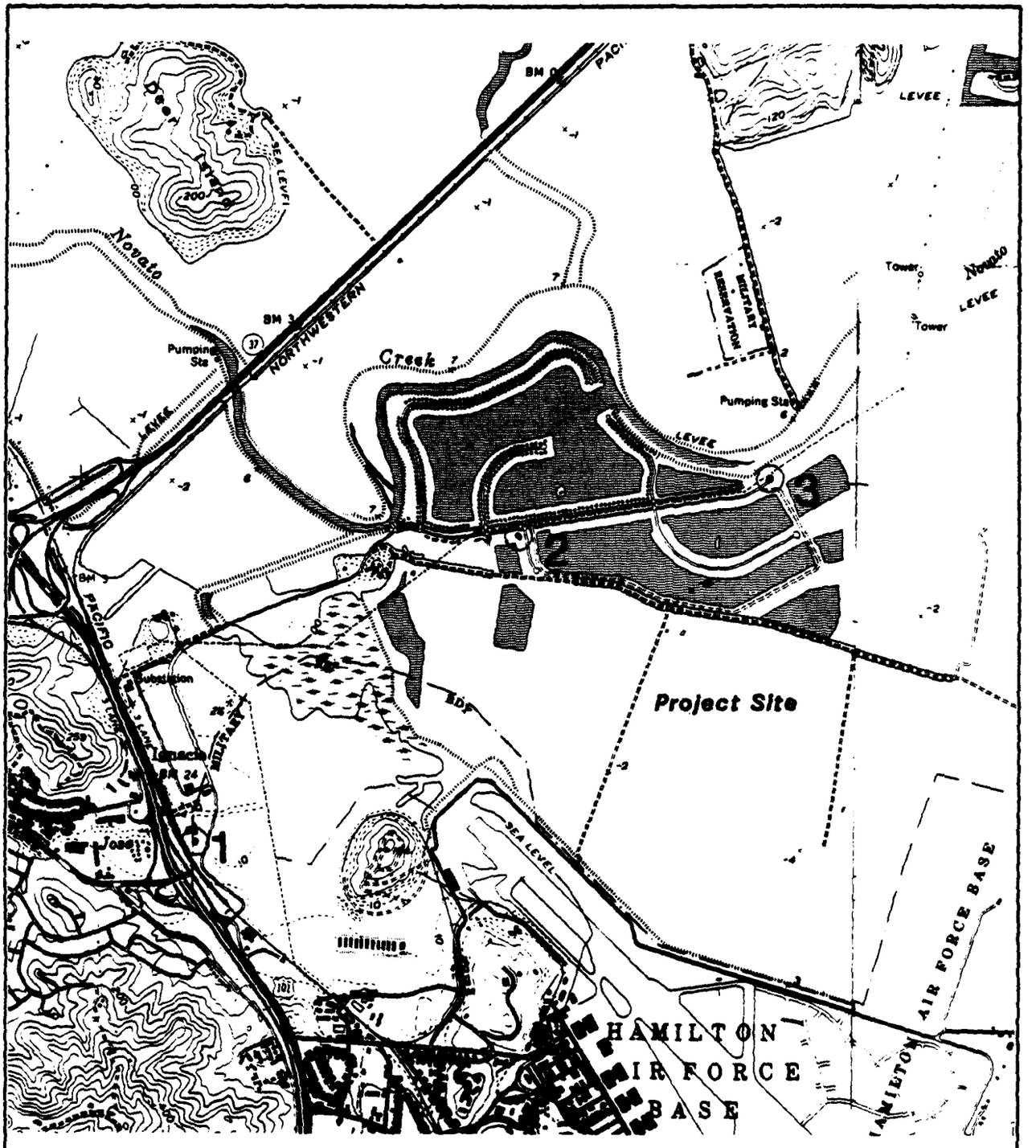
Presently, the proposed project site is remote from nearby noise sources. The noise environment at the site consists of the noise of distant traffic, particularly traffic on Highway 101 and Highway 37. The sound of general aviation aircraft is audible on the site as are the sounds of occasional aircraft taking off and landing at Hamilton field.

To quantify the noise environment at the site, and in areas around the site that could be impacted by noise generated by the project, noise measurements were made on Wednesday and Thursday, 3 and 4 March 1982, at the three sites shown on Exhibit H-1. The purpose of the measurements was to establish existing noise levels in the vicinity of the site and in those areas where traffic generated by the project could potentially affect existing noise levels. The noise measurements at each of the sites were made during the early morning peak (rush) hour and in the morning after peak hour, and the measurements were later adjusted for the p.m. peak traffic hour. The results of the noise measurements are summarized in Appendix III.

The noise environment at site 1 (located near the mobile home park along Bel Marin Keys Boulevard just west of Commercial Boulevard) is the loudest in the study area and is dominated by traffic on Bel Marin Keys Boulevard and traffic on Highway 101. The noise environment at site 2 (in the existing Bel Marin Keys development, at the intersection of Caribe Isle and Bel Marin Keys Boulevard) is dominated by traffic on Bel Marin Keys Boulevard and general aviation aircraft overflights. The noise level at site 3 at the end of Bel Marin Keys Boulevard is typical of the noise levels on the project site and is dominated by distant traffic and occasional general aviation aircraft overflights.

During the measurements, some activity was observed at Hamilton Air Force Base, although it was sporadic. Two airplanes were observed taking off to the north and one helicopter was observed taking off and leaving over the Bay. The maximum noise levels of the aircraft were 54 dBA and 60 dBA measured at site 3. The maximum noise level of the helicopter was 47 dBA also measured at site 3. (Terminology and fundamental concepts of environmental acoustics are presented in Appendix III.)

Based on the noise measurements, an estimate of the existing day/night average noise level (Ldn) at the project site can be made. The Ldn is a single number rating of the average daily noise environment at a given location. The average is arrived at after penalizing (giving a negative weighting to) noises which occur during nighttime hours to take into account people's increased sensitivity to noise at night. The Ldn noise descriptor is used by Marin County to assess the compatibility of proposed developments with the noise environment. Based on the information obtained during the measurement survey, the Ldn on the project site at present is less than 55 dB.



Source: Charles M. Salter Associates, Inc.

TORREY & TORREY INC. 27 environmental/urban planning and design	Noise Measurement Locations	EXHIBIT H1

Impacts

This section discusses the potential impacts associated with the development of Bel Marin Keys Unit 5. The noise issues associated with this project are as follows:

1. Would the proposed project be compatible with existing and future on-site noise levels?

2. What would be the noise impacts on adjacent land uses due to this project?

3. What would be the noise impacts on adjacent land uses associated with the construction of the project?

The Compatibility of the Proposed Development with the Existing and Future Noise Environment. The purpose of a noise and land use compatibility analysis is to determine what constraints, if any, noise may place on the use of a development. For a residential development, the interest is in whether noise levels would interfere with the ability to sleep, relax, converse, and listen to programs inside and whether noise levels would significantly interfere with the use of outdoor space. For commercial and professional office space, protection from speech interference is the primary criterion.

The compatibility of the proposed Bel Marin Keys Unit 5 development with the future noise environment depends upon the disposition of Hamilton Air Force Base. As it is not known at this time what will happen with Hamilton air Force Base, the compatibility of the proposed project with the future noise environment has been assessed for three different conditions: 1) no Hamilton Airport (e.g., for example, a plan which satisifes the land use goals and criteria for the development of Hamilton Air Force Base, which was adopted by the City of Novato and the Marin County Board of Supervisors, December 11, 1979), 2) Hamilton Airport continuing as a military base, and finally 3) Hamilton as a general aviation facility. Clearly, other alternatives could be considered; for example, some military and some general aviation, general aviation plus commercial jets. There are therefore a myriad of potential noise climates in this area. These three scenarios were selected for study because they depict the extremes of potential noise exposure.

In terms of compatibility with the future noise environment, there is no difference in impacts for the project alternatives evaluated in this EIR/EIS. The following analysis is applicable to Alternatives A, B, C, D, and E. Alternative F, the no-project alternative, would be compatible with any future noise environment.

The compatibility of residential uses around airports has been a subject of controversy for many years and much information has been developed as to how much airport noise is tolerable in a residential area. The State of California has prescribed by law the amount of noise that can be visited upon a residential area by an airport. In addition, cities and counties including Marin County

have developed guidelines for determining the compatibility of various land uses with airport noise. All of this information has been developed to determine the upper limit of acceptability. This is important because although a project may be compatible in terms of the law or minimum standards, it does not necessarily mean that people will find the noise environment desirable. This is particularly true in a case like this where the housing may be developed before any decision is made as to what might happen at the airport. In addition to the mandated standards and goals then, an additional criterion can be applied to the compatibility of residential land uses with airport noise based on what people are willing to accept. The proposed project has been evaluated in terms of both sets of criteria. These criteria are as follows:

The State of California has adopted regulations which limit the amount of noise that can be visited upon land uses near airports. The standards are contained in Title 4 of the California Administrative Code, subchapter 6, Noise Standards. For proposed new airports and for vacated military airports being converted to civilian use, the standards do not allow incompatible land uses to be exposed to a Community Noise Equivalent Level (CNEL) of greater than 65 dB. The standards do not apply to military airports. Incompatible land uses are residential uses including single-family and multiple-family dwellings, trailer parks and schools. The only exception in terms of residential use would be apartments in which adequate protection against exterior noise has been included in the design and construction together with a central air-conditioning system. Adequate protection is defined as the noise reduction (exterior to interior) that is sufficient to assure that the interior CNEL in all habitable rooms does not exceed 45 dB. Acoustical performances of the building shall be verified by calculation or measured by qualified officials prior to occupancy.

The proposed interim airport land use plan prepared by the Marin County Airport Land Use Commission[1] contains guidelines for the compatibility of various uses with airport noise. This report takes a site specific approach to the airport noise problem by proposing different standards for residential uses around Gnoss Field and around Hamilton Air Force Base. The report suggests that residential development should not take place around Gnoss Field in areas where the Community Noise Equivalent Level exceeds 55 dB. Around Hamilton Air Force Base, the report suggests that residential land uses would be compatible up to a CNEL of 65 dB. At the time these standards were developed, it was envisioned that Hamilton Field would continue as a military airport. The interim report recognized that the application of a strict standard around Hamilton Air Force Base would render not only the immediate environs unacceptable in terms of housing but large portions of Novato as well.

The Noise Element of the Marin County General Plan[2] also contains guidelines for the compatibility of various land uses with community noise. The Noise Element has identified a CNEL of 55 dB as the goal for outdoor noise levels in a newly developing residential area.

The original research which was undertaken to determine the compatibility of residential development with environmental noise was based primarily on exposure to surface traffic noise. The reason for this, of course, is that more

people are exposed to surface traffic noise than any other major urban noise source. A recent study[3] has shown that people do not respond in the same manner to airport noise that they do to traffic noise. This study demonstrated that the percent of people "highly annoyed" is higher for a given level of airport noise than for the same level of traffic noise. For example, only about 5% of the people would be "highly annoyed" in a traffic noise environment with a CNEL of 55 dB. Approximately 20% of the persons experiencing airport noise at the same level, however, would be "highly annoyed." As the noise level increases, the disparity in response is even greater. When airport noise reaches a CNEL of 65 dB, the maximum allowed by state law in residential areas, 35% to 40% of the people would be expected to be highly annoyed. Ony about 20% of the people would be expected to be highly annoyed in a traffic noise environment at the same level. To keep annoyance to a minimum then, it is obvious that residential areas around an airport should be exposed to CNEL's less than 55 dB. Based on experience in similar situations[4] it appears that the outdoor noise environment around an airport where the CNEL is less than 55 dB, would be considered acceptable by most people. However, indoor noise levels due to overhead noise in homes of standard construction are often high enough to occasionally interfere with activities if maximum levels generated by individual aircraft as they fly overhead exceed 50 dBA. It is therefore recommended that to be compatible with aircraft noise, the exterior CNEL should not exceed 55 dB and instantaneous maximum noise levels inside of homes should not exceed 50 dBA.

The State Aeronautics Standards consider commercial uses to be compatible with airport noise above a level of CNEL of 65 dB. The standard makes no reference to professional office space. The Marin County Noise Element suggests that professional office space is compatible with a CNEL of up to 70 dB and that commercial space is compatible with a CNEL of up to 75 dB. To assure that the potential for speech interference would be minimal, maximum noise levels indoors for individual events should not exceed 55 dBA. Assuming these buildings are of typical construction and that they are mechanically ventilated, they could be constructed in an area where single event noise levels did not exceed 85 dBA outside and be compatible.

The existing CNEL at the proposed site is less than 55 dB. Under the no-airport scenario then, the proposed uses would be compatible with the noise environment and no special treatment to the buildings would be required.

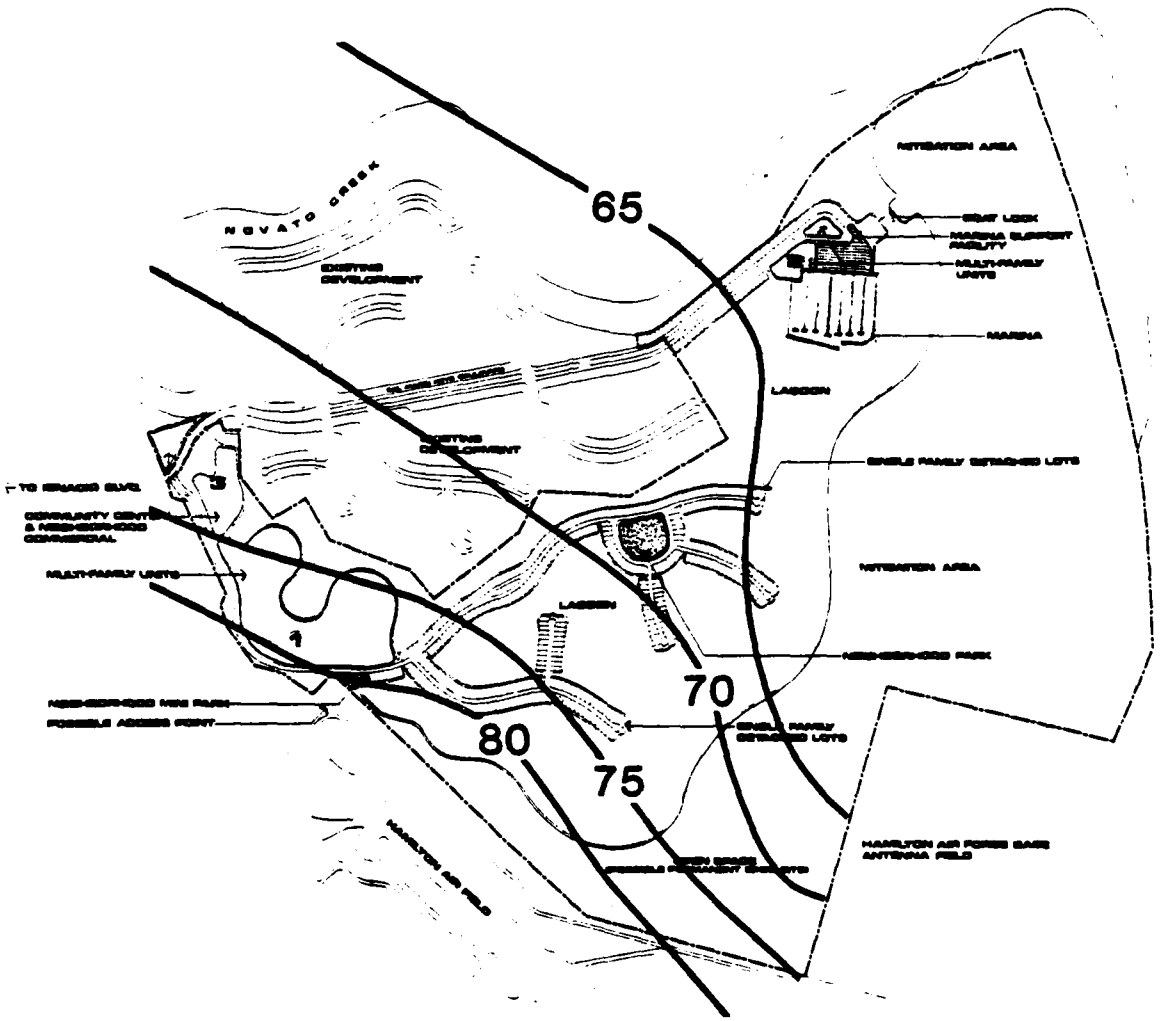
To obtain an estimate of the compatibility of the project if Hamilton Air Force Base continued as an airport, two scenarios have been evaluated. The future noise contours for these two scenarios were taken from the "Final Environmental Impact Statement on the disposition and use of federal surplus property at Hamilton Air Force Base, Novato, California." Figure IV-11 of that report shows the equal noise contours based on 1970 military operations. These contours are shown in Appendix III. It was assumed that if Hamilton continued as a military base, it would continue at about the 1970 operation level. Figure IV-10 of the GSA Environmental Impact Statement shows the equal noise contours based on general aviation aircraft use only. These

contours are shown here in Appendix III. The contours were developed based on 100,000 annual operations. The final EIS includes contours for various levels of commercial activity and combinations of commercial, general aviation and military activity. The footprints of these contours fall between those shown in Exhibits H-2 and H-3.

As can be seen from Exhibit H-2, if military use of the airport were to continue, almost the entire project site would be exposed to a CNEL of greater than 65 dB. Although the state standard does not apply to military airports, new residents in this area would not make a distinction between military and civil aircraft and would be expected to complain vociferously about aircraft noise. Under the military airport scenario then, essentially the entire project would be incompatible with the aircraft noise. This represents a significant adverse impact, which could not be mitigated. It would theoretically be possible to mitigate noise levels such that maximum noise levels inside the units did not exceed 50 dBA. However, this would be costly, and in any case, the outdoor noise environment would be such that outdoor spaces would be essentially unusable.

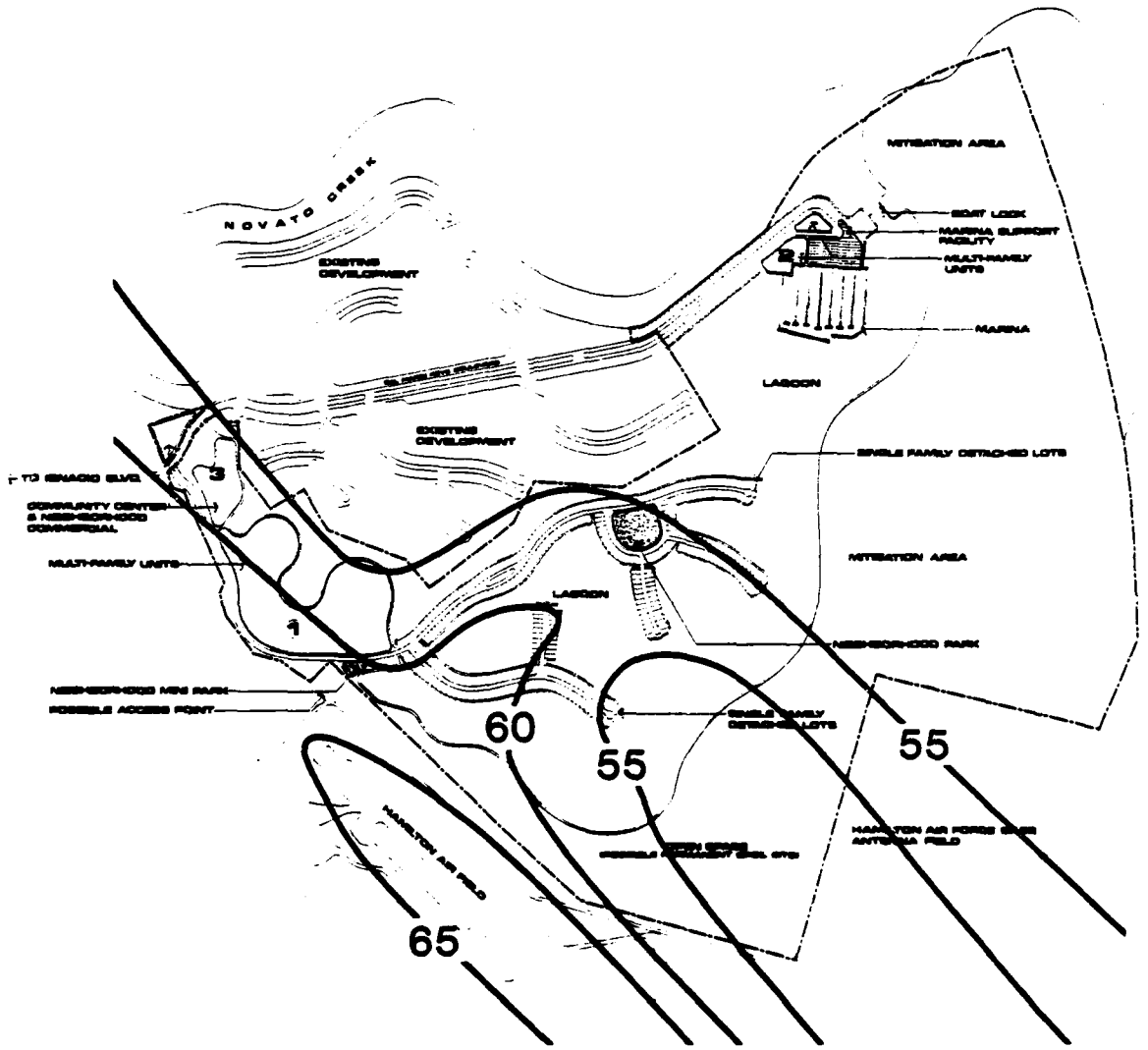
A question was raised as a response to the notice of preparation for this report about what would happen if military helicopters were to be used at the airfield. It is difficult to say exactly what would happen because the impacts on the future developemnt would depend on where the helicopters flew. Presently, helicopters take off at the far south end of the airport and fly over the bay. Under this condition, noise levels in the proposed development would be expected to be about 50-55 dBA. This noise would not result in a significant impact on future land uses. If the helicopters took off at the north end and passed directly over the homes, noise levels of up to 90 dBA could be anticipated. This would result in occasional speech interference indoors and out. When a definitive proposal for helicopter use is developed, it should be evaluated to assure that there would be no impact on future development.

Under the other aviation scenario of developing Hamilton Air Force Base as a general aviation facility, much of the project would be exposed to a CNEL of less than 60 dB and all of the project would be exposed to a CNEL less than 65 dB. The project would therefore be compatible with the airport noise environment in terms of the state aeronautics standards. The only portion of the project which would be compatible with a general aviation facility in terms of both the state standards and Marin County Guidelines is the portion of the project at the end of Bel Marin Keys Boulevard containing the 74 single-family homes and the marina. Standard construction of the homes, townhouses and condominiums in this part of the project would result in peak levels of less than 50 dBA inside, therefore meeting the conservative criteria established for compatibility in this report. This portion of the project would therefore be compatible with Hamilton Air Force Base if it were developed as a general aviation aircraft facility, based on the assumed number of flights and flight paths shown in Appendix III.



Source: Charles M. Salter Associates, Inc.

TORREY & TORREY INC. 27 environmental/urban planning and design	CNEL Noise Contours for Continued Military Use at Hamilton	EXHIBIT H2



Source: Charles M. Salter Associates, Inc.

TORREY & TORREY INC. 27 environmental/urban planning and design	CNEL Noise Contours for General Aviation Use of Hamilton	EXHIBIT H3

The majority of the development would be exposed to noise levels of a CNEL from about 55 dB to about 63 dB. The majority of the project would not be consistent with the Marin County Guidelines; that is, the CNEL would exceed 55 dB. Based on the recent information describing people's sensitivity to aircraft noise, 20-30% of the people in this portion of the development could be expected to be highly annoyed by aircraft noise. Maximum noise levels outside of these units caused by individual airplanes would vary depending on location of the units with respect to the flight path and would range between 75 and 85 dBA. If these units are not air-conditioned and rely on open windows for ventilation, maximum noise levels inside the dwellings would range from about 60-70 dBA. This would result in occasional interference with watching TV, sleep disturbance, and interference with conversation. To assure compatibility with aircraft noise at least indoors, modification of dwellings would be required to reduce interior levels to at or below 50 dBA. It would be impossible to mitigate outdoor sound levels and occasional interference with outdoor activities would be expected on a continuing basis. These are considered to be significant adverse impacts. The impacts would be the same for all the alternatives except Alternative F.

Both the office and professional uses would be compatible with the no-airport scenario. If the airport continued as a military base, the commercial area would be exposed to a CNEL of between 70 and 75 dB and would be compatible with the noise environment. The professional office space would be exposed to a CNEL of between 70 and 75 dB and occasional speech interference could be expected inside the professional office development. Building modifications could result in office use that would be compatible with the airport noise. If Hamilton became a general aviation facility, both the professional office space and the commercial space would be exposed to a CNEL of between 55 and 60 dB. Both uses would then be compatible with airport noise.

Impacts of the Proposed Development on Adjacent Land Uses. The potential impacts on adjacent land uses due to the development of Unit 5 fall into the following categories: the potential for increased noise levels along streets serving the project; and the potential for impacts on existing land uses due to noise emanating from the marina and the commercial facilities.

Using the traffic projections presented in the transportation section of this EIR/EIS, an analysis was performed to determine the potential for impact on existing development due to traffic generated by the project. This analysis was performed for each of the project alternatives.

The greatest increase in traffic noise is anticipated to occur in the vicinity of the end of existing Bel Marin Keys Boulevard. At this location, there is little traffic today but in the future this street would carry the traffic from the new single-family homes, the restaurant, and the marina facility. Based on the information obtained during the noise level survey, the existing Leq during the morning peak hour in this hour is about 53 dBA. Under Alternatives A, C, D and E, noise levels during the peak hour would be expected to increase by about 4 dBA to a Leq of 57 dBA. A 4 decibel change in traffic noise is noticeable and would be expected to result in sporadic complaints. The

resulting Leq of 57 dBA is about 2 decibels above the Marin County Noise Element's recommendation for environmental noise in residential neighborhoods. This is considered to be an adverse but not significant impact. In the rear yards of these homes, because they are farther from the road and because they are screened slightly from the traffic noise by houses, noise levels would be expected to remain below an Leq of 55 dBA. Under Alternative B (no marina), noise levels would increase only by approximately 2 dBA resulting in a Leq of 55 dBA in front of the homes at the end of existing Bel Marin Keys Boulevard. The increase of 2 dBA would not be noticeable and no complaints would be expected.

Existing homes near the entrance to Bel Marin Keys on Bel Marin Keys Boulevard would experience a lesser increase in traffic noise because existing traffic noise levels are higher in this area. Under Alternatives A, C, D and E, noise levels would be expected to increase by 3 dBA resulting in a morning peak hour noise level of an Leq of 60 dBA in front of these homes. As before, the noise levels in the rear yards of these homes would be expected to be below the County's goal of 55 dBA. The increase of 3 dBA is a barely detectable difference and would not be expected to generate adverse community response. Therefore this is considered to be an adverse but not significant impact. Under Alternative B, the resulting noise level in front of these homes would be an Leq of 59 dBA during the morning peak hour, an increase of only 2 dBA over existing levels. Again, a 2 dBA increase in traffic noise is not generally noticeable and no adverse community response would be expected. Noise levels along the remainder of Bel Marin Keys Boulevard under any of the alternatives would not increase by more than 2 dBA. None of these increases would be generally noticeable and no adverse community response would be anticipated.

The marina facility under Alternatives A, C, D and E would be located over 1000 feet from the nearest existing home. The sound of power boats would be audible at these homes but due to speed restrictions in the lagoon area, the maximum noise level of these boats would be expected to be below typical existing maximum noise levels in the area and no adverse community response would be anticipated. Under Alternative B, there would be no marina and thus, no impacts from additional motor boats.

The commercial facility would be located to the west of the existing development on Bel Marin Keys Boulevard and would be several hundred feet from the nearest home. Noise emanating from this facility due to cars in the parking lot and mechanical equipment would be below existing ambient noise levels in the area and no impact would be expected.

Construction Noise Impacts. Construction of this project would entail dredging of the lagoon, placing earthwork, construction of roads, and erection of the dwelling units. The greatest amount of noise would be generated during the earth moving phase. Graders, front end loaders, and trucks would be the primary noise sources during this activity. If muffled, these pieces of equipment typically generate 80-85 dBA measured at a distance of 50 feet from the source. Because this development will back up to the existing development

in the area, this equipment will occasionally operate as near as 50 feet from the nearest existing home. Noise levels outside in the rear yards of these homes would therefore reach peak levels of up to 85 dBA. Inside of these homes with the windows closed, noise levels would be expected to be below 60 dBA and would not interfere with speech or television watching but might be annoying and occasionally generate complaints. During the majority of the time, this equipment would be much farther from existing homes and the noise levels outdoors would be expected to be below 60 dBA. Although this noise would be noticeable, due to its short term nature adverse community response would not be anticipated. During paving of the roads and construction of the homes, noise levels outside the nearest homes would be expected to reach levels of up to 70 dBA. Again, although this may occasionally be annoying, because of its short term nature, significant adverse community response would not be anticipated.

In summary, the findings indicate that the proposed project would be compatible with the future noise environment if Hamilton Air Force Base does not continue as an airport facility. The project would not be compatible with continued use of the airport as a military facility and the project might be compatible with a general aviation facility at Hamilton Air Force Base, if extensive mitigation measures are included in the design of most of the units in the project. Traffic noise levels, particularly in the existing Bel Marin Keys Development, would increase by barely noticeable amounts, and some adverse community response could be expected. These impacts are not considered to be significant. The noise emanating from the commercial and marina facilities will not be greater than existing noise levels in the area and would not constitute an impact on existing residential land uses. Finally, there is a potential for some noise impact during the construction process. Mitigations for this impact are recommended below.

Mitigation Measures - Airport Noise

- The majority of the project would have to be designed to mitigate for noise. If the project is approved prior to resolution of the Hamilton Air Force Base question, at minimum, the following steps should be taken:

a. (County Responsibility) The county should assure itself that any airport activity at Hamilton will not result in homes being exposed to a CNEL greater than 65 dB in accordance with state law.

b. (Joint County and Developer Responsibility) All prospective purchasers of units should be made aware of the possibility that they may experience aircraft noise in the future.

c. (Developer Responsibility) All units in the project should be designed so that the interior Community Noise Equivalent Level (CNEL) does not exceed 45 dB and that the instantaneous maximum noise level due to individual aircraft flyovers does not exceed 50 dBA. At a minimum, closed windows would be required in those

units exposed to a CNEL of greater than 60 dB. These units would have to be mechanically ventilated. Additional treatment consisting of acoustically-rated window, wall and ceiling constructions may be required depending upon the noise exposure of individual units.

Mitigation Measures - Construction Noise

- (Developer Responsibility) To reduce construction noise impacts, the following steps should be taken: all equipment should be adequately muffled and maintained; construction hours should be limited to 8:00 a.m. to 5:00 p.m. and haul roads for earth moving equipment should be located as far as possible from the nearest existng homes. During the construction of Unit 4, major haul routes were located within 100 feet of the nearest homes. Construction noise would be mitigated by keeping these roads 500 feet away from the existing homes, where possible.

Footnotes

[1]Marin County Airport Land Use Commission, Proposed Interim Airport Land Use Plan, Setpember 20, 1974.

[2]Noise Element, Marin Countywide Plan adopted October 14, 1975.

[3]Fred L. Hall, Susan E. Birnie, S. Martin Taylor, and John E. Palmer, "Direct Comparison of Community Response to Road Traffic Noise and Aircraft Noise," the Journal of the Acoustical Society of America, December 1981.

[4]John W. Swing, Editor, Board for Noise Control Engineering (magazine) NCE, "A Case for Single-Event Intrusion Criteria in Achieving Noise Compatible Land Use," NCE, November-December 1978.

I. HYDROLOGY, WATER QUALITY, EROSION AND SEDIMENTATION

Setting - Hydrology

The project site is located near the mouth of the Novato Creek Basin which has a drainage area of about 44 square miles. Precipitation ranges from a maximum of 54 inches in the western and southern portions of the basin to a minimum of 14 inches in other areas. Precipitation in the project area averages approximately 22 inches per year.[1] Elevations within the basin range from approximatley four feet below mean sea level (MSL) to about 1900 feet above MSL. The basin is bounded on the north by the Petaluma River Basin, on the west and southwest by Big Rock Ridge, on the south by Hamilton Air Force Base, and on the east by San Pablo Bay. Novato Creek rises in the extreme northern part of the basin and winds through a steepsided canyon westward and southward into Lake Stafford. Below the lake, a number of tributary streams, rising along the northern slopes of Big Rock Ridge, drain into the creek as it flows through the City of Novato and across the coastal plain into San Pablo Bay[2]. Major tributaries of Novato Creek include Warner Creek, Arroyo Avichi, Arroyo San Jose, and Pacheco Creek.

Part of the proposed site would border Novato Creek. Records from the stream gaging station on Novato Creek at the City of Novato (100 feet upstream from the 7th Street Bridge) indicate the creek has a mean monthly discharge of 9.9 cubic feet per second (cfs). This varies from an average of about 40 cfs for the month of January to 0.06 cfs for the month of August.[3]

Novato Creek flows northeast from the project site toward the Petaluma River about 1.6 miles away. Tidal currents in that area of the Petaluma River are quite strong. Incoming tidal flows can exceed 1.9 feet per second (1.7 knots) while outgoing (ebb) tidal currents can exceed 3.5 feet per second (2.1 knots).[4]

The average ground surface elevation on the project site is about four feet below MSL. The elevations range from 41 feet above MSL at a hill on the west project boundary to about 10 feet below MSL at excavations used to obtain material for the existing Bel Marin Keys development[5]. Drainage on the site is through a series of ditches which collect surface runoff to be pumped into the bay. The ditches contain water throughout most of the year.

The site of the proposed project is generally within the Marin County F2 (Secondary Floodway District) zone. The purpose of the F2 zone is to provide for the temporary storage of flood water from Novato Creek until the creek subsides. The floodwaters can then be pumped or otherwise discharged back to the creek after the danger of flooding has passed. Under the normal requirements of this zoning, twenty-five percent of the land area may be filled. The remaining percentage of the project site should be available for water storage. The lagoon areas would allow the passage of flood waters to the creek through the developed areas of the project. Since the open space area would be unfilled, the flood waters would pond and be pumped out to the Bay. In the event the water elevation rises to elevation 6.0 feet above MSL, outflow

by means of a spillway or gates would be provided to San Pablo Bay.[6] Flood elevation in the project vicinity is about 6.5 feet, the level of the 50, 100, and 500 year flood coinciding.[7]

Impacts - Hydrology

Construction of Alternatives A through E of Unit 5 at Bel Marin Keys is not expected to create a significant adverse impact on the area's hydrology nor to subject future residents to an adversely high flood risk if it is constructed according to F2 zoning standards. The F2 Secondary Floodway District requires that only 25 percent of the land be filled, leaving the remaining 75 percent as a ponding area in time of flooding or that a suitable sized floodway be available to carry flood waters into the Bay. The lagoons would provide the necessary ponding area while spillways or floodgates would provide discharge of flood waters. By raising the areas on which buildings would be placed above the flood hazard level, the development effectively mitigates most adverse impacts from flooding.

A minor beneficial impact on the area's hydrology would occur if the development is constructed. The lagoons would provide the required detention storage of creek water during a flood. That is, during a flood, as the water level rises, water would flow into the lagoon areas and be temporarily stored. This water thus would not be available to raise water surfaces elsewhere if confined within the creek channel. This is a minor cumulative benefit of such creekside developments.

Alternatives C and E, with off-site mitigation areas, would not be able to provide the same amount of temporary flood water ponding area as the other project alternatives.

Alternatives A, B, and D allow temporary storage of floodwaters on open space areas. Mitigation Alternative A-2 of Alternative A, by creating a salt marsh on the bay-side of the perimeter dike, would also reduce the land available for seasonal flooding by Novato Creek overflow compared to Mitigation Alternative A-1.

Bel Marin Keys Unit 5 (Alternatives A through E) is not expected to have a significant adverse impact on groundwater conditions in the project area. The lagoons would reduce the seasonal fluctuation of the water table depth. Areas near the lagoons would have a high water table throughout the year. If Alternatives C or E were selected, the agricultural land near the levees may not dry as rapidly in the spring which may delay some harvesting operations. This is not considered significantly adverse.

Mitigation Measures - Hydrology (Developer Responsibility)

- As the applicant proposes, building elevations should be raised above the flood hazard level. The finished floor elevations should be above the flood levels as specified by the County Department of Public Works.

- Project design and construction should meet F2 zone requirements.

- As the applicant proposes, spillways or floodgates should be incorporated into the project design to discharge water when it reaches 6.0 feet above MSL elevation.

Setting - Water Quality

Water quality in the existing main lagoon is maintained by draining it down approximately four feet once a month and refilling it. Wind currents over the lagoon surface provide sufficient mixing of the lagoon water to have a reasonably uniform composition over the entire lagoon.[8] Suspended sediment that enters with the new water has time to settle in the lagoon between flushings. The clearer water allows some algae and aquatic plants to grow but it appears the flushing and quantity of plant nutrients in the water limit growth sufficiently so that the water quality in the main lagoon is adequate.[9]

Other existing lagoons are connected to the main lagoon by large pipes. Flows through the pipes are restricted by marine organism growths and by hydraulic conditions. Flushing of the main lagoon may not adequately treat water in the other lagoons as the connecting pipes become clogged. A report prepared for the Bel Marin Keys Community Services District[10] indicated the accumulation of nutrients in the other lagoons may cause nuisance concentrations of algae or other aquatic plants with accompanying insect and odor problems. Water evaporation may cause the concentration of sea salt to rise to objectionable levels. Street drainage of accumulated oils and grease, heavy metals, and litter may also cause deterioration of the lagoons for aesthetic and recreational purposes.

Waters in Novato Creek during most of the year are from San Pablo Bay, and these waters do not have high concentrations of nutrients. There is no sewage discharged to the Creek and, except for periods of rain when street runoff enters the creek upstream from Bel Marin Keys, Creek waters appear suitable for flushing to maintain water quality.[11]

The lagoons in the proposed development would be connected to Novato Creek by a navigational lock and by a circulation system which would serve to maintain lagoon water quality and provide a flushing action for Novato Creek. This would help maintain a navigable channel in the area where the existing homes have docks on the creek.[12] The drainage from the developed area would flow into the lagoons and would be discharged as a part of the outflow from the lagoons.

Water quality in the existing lagoons was examined during the preparation of the EIR on Bel Marin Keys Unit 4 as well as for this EIR/EIS. The water quality was found to be of "surprisingly good quality," with no significant indication of problems.[13] The quality was thought to be maintained both by the depth of the lagoons (nearly 30 feet) and possible inflow of cool groundwater. The groundwater would replace water lost by evaporation and reduce water temperatures in the summer.[14] The lagoons proposed for Bel Marin Keys Unit 5

would comprise 546 acres (Alternative A). In general, the lagoons would be about 13 feet deep. In the area of the commercial marina, the lagoon would be about 27 feet deep. The deep lagoon at the marina would provide for the accumulation of sediments until the sediments were removed by dredging.

Water quality in the diked agricultural areas of the proposed project site is not as good as the water in the lagoon. The water in the drainage ditches is not mixed by tidal action. Rainwater is drained slowly through the Reyes clay soil. Degraded water quality in these diked wetland areas has adversely affected the soil invertebrate communities and significantly altered their use by wildlife.[15] Some agricultural areas of the project site are four to five feet below MSL. Surface runoff collects in these areas and then becomes stagnant. A series of drainage ditches are used to bring this water to pumps which then transport it to the bay. Discharge of the pumped water into San Pablo Bay has a minor cumulative adverse impact on the local water quality.

Impacts - Water Quality

There are three areas of potentially adverse water quality impacts which may occur from the proposed Bel Marin Keys unit 5 development: 1) impacts from sedimentation during project construction; 2) impacts from development-site pollutants on Novato creek; and 3) impacts from project-site pollutants on the water quality of the lagoons within the development. Potential impacts from construction-generated sedimentation are discussed in the following section on erosion.

The normal level of pollutants presently leaving the project site and entering Novato Creek is not considered to have a cumulative adverse impact. The Novato Creek has a drainage area of about 44 square miles; the primary impacts on water quality within that area are from water diversion for agriculture, pesticides and fertilizers in agricultural return flows, and pollutants contained in urban runoff. The project would contribute incrementally to the urban pollutants now entering the creek from developed areas within the drainage area. The proposed project is not expected to have a significant adverse impact on the water quality of Novato Creek as a whole.

There may be significant adverse water quality impacts, however, within the proposed lagoon. The major problem arises from limited circulation within the lagoon. Without proper circulation, the water cannot disperse or assimilate the pollutants deposited within it. Expected pollutants are oil and grease from power-boats (especially two-cycle outboard motors) operated or kept within the lagoon, oil products and small amounts of heavy metals washed from road and parking surfaces, and excess nutrients from landscaped areas near the water. Lawn fertilizers are the most prevalent chronic source of nutrients in the water areas of urban developments.[16] Nutrients in the water from fertilizers lead to increased potential for algae blooms.

The proposed commercial marina and fuel dock could be expected to produce the greatest concentration of oil and grease pollutants. Selection of Alternative B, the proposed project without the marina, would eliminate this potential

water pollution source. Alternatives A, B, and D with on-site mitigation areas would allow marsh vegetation and accompanying populations of microorganisms to trap and utilize some excess nutrients in the water.

The flushing system proposed by the applicant takes advantage of the water surface elevation difference during the tidal cycle. At the project site, the expected range between high and low tides is about six feet, as shown in Exhibit I-1. By discharging water from the lagoon at low tide, the water quality can be maintained at acceptable levels. In addition to the flushing system designated by the project engineers, the most feasible method of maintaining good water quality is by preventing pollutants from entering the lagoon through operation of a water quality maintenance plan, as described below.

Selection of Alternatives C or E would require the continued pumping of agricultural drainage water from the farmed areas into San Pablo Bay. The drainage water would continue to have a minor cumulative adverse impact on the local area of the discharge point.

Mitigation Measures - Water Quality (Developer Responsibility)

All of the following mitigation measures apply to Alternatives A through E. Alternative F (no project) requires no mitigation.

- Specific hydrologic studies will be necessary when the actual configuration of the lagoon is determined (depending upon which alternative is selected.) Specific data calculations and estimations of the following parameters should be completed by the developer.

  a. Typical residence time of lagoon water during the late summer and early fall

  b. Solar warming (thermal stratification) of lagoon water and its effect on primary aquatic productivity

  c. Projected biochemical oxygen demand (BOD) in the lagoon during the late summer and early fall

  d. Nutrient loading within the lagoon

  e. Water circulation within the lagoon

  All of these studies should be completed prior to final design to ensure that adequate mitigations for any specific water quality problems are incorporated into the design of the lagoon.

- The developer should present the future homeowner's association with a detailed operation and maintenance plan to keep the water quality of the lagoon at an acceptable level. Elements of such a plan should include, but are not limited to:

a. Restrictions on fertilizer and pesticide use on parcels adjacent to the lagoon

b. Restrictions on car washing, to prevent soap and detergents from entering the lagoon through the street curb inlets of the storm drain system

c. A regular program of street sweeping to remove pollutants before they enter the lagoon

d. Anti-litter enforcement and provisions for trash collection and disposal at the marina, neighborhood parks, parking facilities, and at other open-space areas

e. Provisions for periodic debris and litter removal at the lagoon shoreline and within the commercial marina

f. Guidelines for a water quality monitoring program with periodic sampling to identify potential water quality problems before they become serious. The water quality sampling and testing could be done by the Community Services District in much the same way homeowners with swimming pools test their water.

g. Corrective measures (Contingency Plan) which would be undertaken before adverse water quality resulted in algae blooms on fish kills.

Several of these elements are difficult to implement. Therfore, the primary emphasis should be placed on designing the lagoon to minimize water quality problems.

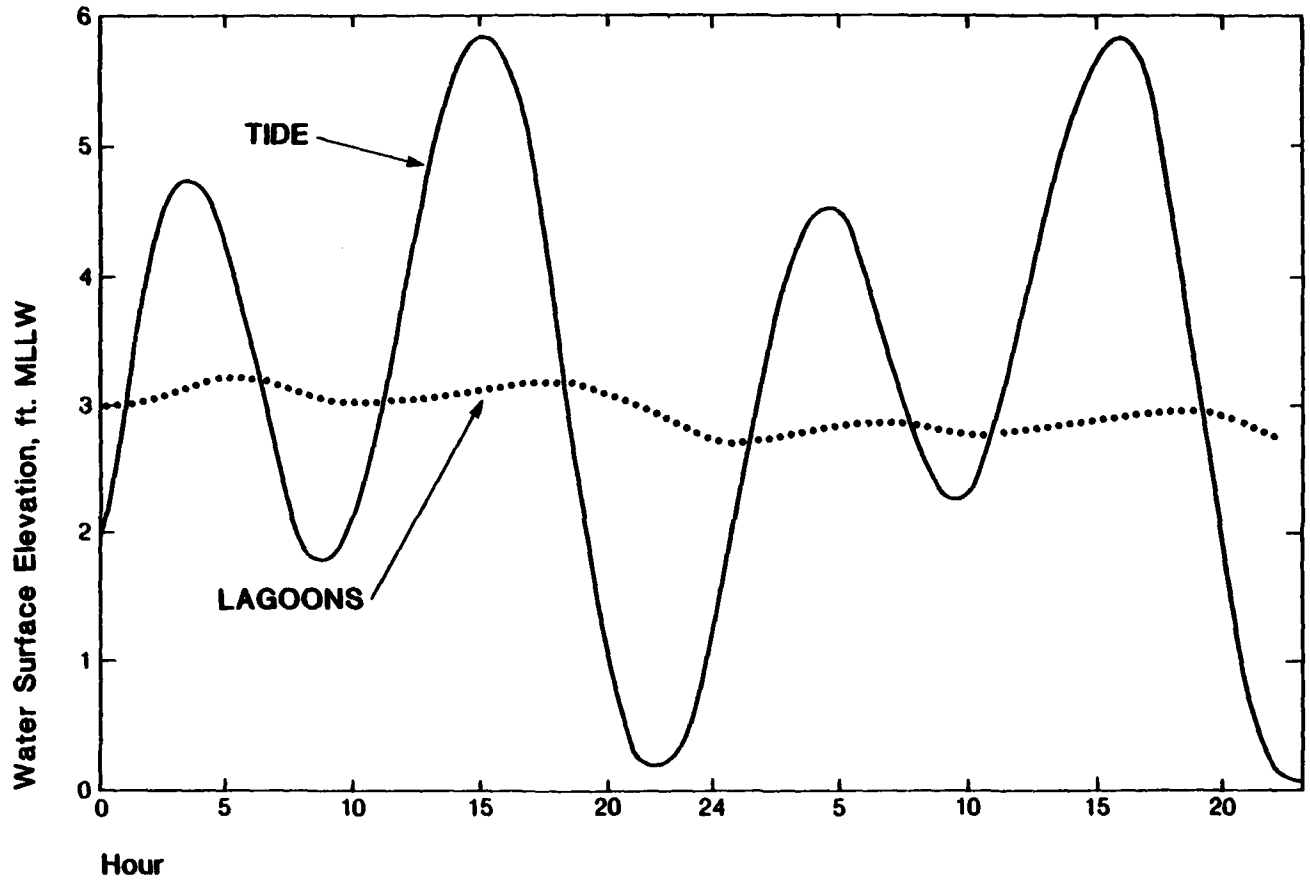
- Specific water quality objectives of the operation and maintenance plan should include the following:

  a. Dissolved oxygen: 5.0 mg/1 minimum; annual median: 80% saturation

  b. ph: variation from ambient pH within adjacent waters of Novato Creek and San Pablo Bay by no more than 0.5 pH units

  c. chlorophyll "A" concentrations: 50 mg/1 maximum. When concentrations of chlorophyll "A" in the adjacent Novato Creek exceed this, the concentrations within the lagoons shall be not more than 20% above creek concentrations

  d. No visible, floating, suspended, or deposited oil or other products of petroleum origin



Source: Cheney and Krone, 1977

TORREY & TORREY INC. environmental/urban planning and design	Lagoon Response to Tidal Action	EXHIBIT 11

e. Water quality within the lagoons shall be managed so as to prevent the presence of toxic or other deleterious effects on aquatic biota, wildlife or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biolgoical concentration.

Setting - Erosion and Sedimentation

Present levels of erosion and sediment generation on the project site are very low. The agricultural use keeps a protective vegetative cover over the soils for most of the November through April rainy season. The flat and level nature of the terrain also keeps erosion low. The area's primary soil, Reyes clay, has a low soil erosion hazard rating in its current condition.[17] Using equations developed by the USDA,[18] the site is expected to currently produce less than 0.1 ton of sediment per acre per year.

The primary source of sediment in the existing lagoons, however, is sediment-laden flows from both Novato Creek and San Pablo Bay. Sedimentation has been occurring at Bel Marin Keys since its construction. Before 1974, the main lagoon was open to Novato Creek, and sediment-laden tidal flows brought material into the quiet waters of the lagoon where it settled and accumulated. A dam equipped with gates and a lock was constructed in 1974 at the inlet to the main lagoon to prevent the movement of sediment into the lagoon with incoming tides. Water stored in the lagoon during high tides is released once a month to provide flushing flows that scour Novato Creek downstream from the lock.[19]

A comparison of hydrographic surveys made in 1971 and 1977 indicated the extent of change in creek depths. The bed elevations downstream in 1971 averaged about 13 feet below mean sea level (MSL) and ranged between 11 and 17 feet below MSL. The bed elevations found in a 1977 Community Services District survey averaged about six feet below MSL with a range between five and seven feet below MSL. There was significant sedimentation in this section of Novato Creek after 1971.[20] Water depths in the creek upstream from the lock showed no significant change between 1971 and 1977. The similarity of water depths shown in the two surveys indicated the creek depth being maintained by tidal flows.[21]

Impacts - Erosion and Sedimentation

There is potential for significant adverse impact from high sedimentation rates during the earthmoving and grading phase of development. The applicant proposes to remove material from within the project using this material to raise building sites above the flood level. At the same time, this removal would form 404 or 546 acres of lagoons throughout the project, depending upon the Alternative selected. It is estimated the quantity of earth needed to be removed to form the 546 acre lagoon area is about nine million cubic yards. (Alternative A). During such large earth-moving activities, the rate of soil lost through erosion greatly increases. Soil loss rate from the exposed lagoon

slopes may exceed a rate of over 100 times the predevelopment rate. The clay and silty clay soils on the site are very susceptible to suspension in water, being composed of very small particles. (Although the Marin County soil survey states the hazard of erosion is very low on Reyes clay, this refers to the soil in its level, undisturbed conditions. Once disturbed by grading activity and left exposed on slopes, the erosion hazard is very high.)

A high groundwater level may be encountered during the grading operations. Groundwater levels vary seasonally from near the surface to depths of about eight to ten feet.[22] Presence of high groundwater levels may impact the grading operations. If the material to be graded is too wet to be removed by standard earth-moving equipment, the area may need to be dewatered by pumping or the wet material may need to be placed in special dewatering areas. In both cases, the excess water needs to be disposed of in a non-detrimental manner.

While there is a potential for significant adverse impact on Novato Creek and the Petaluma River entrance from project-generated sediment deposition, the lagoon features of the development allow the impact to be mitigated to insignificant levels through proper design and scheduling of an erosion and sediment control plan. If a berm is left at the proposed creek entrance to seal creek water out, the project site would function as a bowl, trapping all generated sediment within the lower areas. Some turbidity will be produced, however, when the levee between the existing lagoons of Unit 4 and the new lagoons is removed. This levee would need to be removed using dredging techniques rather than grading.

Sediment accumulating within the project's lagoons after construction would be removed to on-site disposal areas in Alternatives A, B, and D. The dredged material from the lagoon would be deposited sequentially on 154 acres of seasonally flooded field. From 56,000 to 231,000 cubic yards of sediment would be dredged every seven years.[23] The material would be deposited within diked cells from five to 22 acres in size. Cells would be filled to approximately one foot above MSL. The first dredge cells would be formed on the side nearest the bay. Later cells would be established adjacent to the initial cells producing a network of individual cells as each is allowed to dewater.

The sediment disposal areas would eventually be converted to salt marshes. Marsh establishment on dredged material is sufficiently understood to be considered feasible for a wide range of considerations.[24] The San Francisco Bay and Estuary Dredge Disposal Study of the U.S. Army Corps of Engineers included a marsh development study to determine workable procedures for establishing intertidal marshland plants upon dredged material.[25] While the biological aspects of marsh establishment have been determined for areas such as the project site, site-specific engineering analysis is crucial. The success or failure of marsh development on dredged material is initially dependent upon the engineering aspects of the situation.[26] There are available estimates, however, which can assist the project engineer in sizing the diked [illegible] determining the volume of dredged material each cell can [illegible] significant adverse impact is associated with this method of [illegible] disposal.

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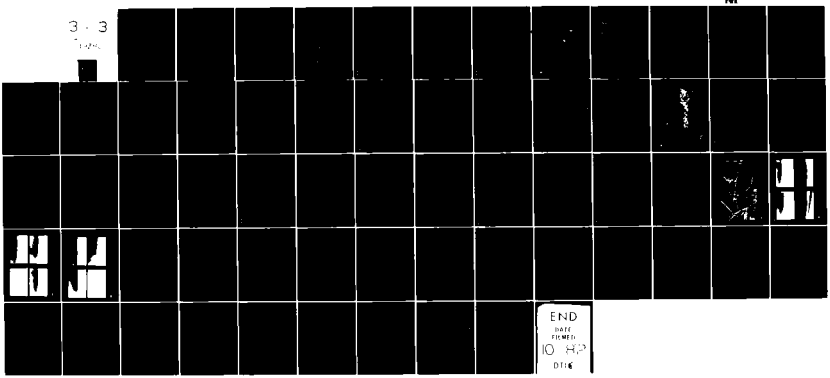

Alternatives C and E would not have available on-site sediment disposal areas and would require an off-site disposal area. Disposal of dredged material is highly regulated in the Bay Area. Disposal of the material at an approved disposal site is not expected to produce a significant adverse impact. Alternatives D and E, because the total lagoon area would be reduced from 546 to 404 acres, would have a corresponding reduction in sediment accumulation area. They would thus have less sediment to dispose.

Mitigation Measures - Erosion and Sedimentation (Developer Responsibility)

All of the following mitigation measures apply to Alternatives A through E unless noted. Alternative F (no project) would not require mitigation.

- To mitigate potential erosion impacts, the applicant should submit, as part of the grading permit process, an erosion and sediment control plan. Major elements of the plan should include:

  a. Provision for leaving the existing berm across the mouth of the proposed lagoon until grading is completed to prevent escape of sediment-laden water (proposed by developer).

  b. Schedule of filling operations indicating the fill would be placed on the site boundaries first, then moved inward. This would keep the site sloping inward and contain sediment on-site (proposed by developer).

  c. A fill-slope diversion should be kept on the southern border to prevent runoff from flowing down onto the adjacent lower land.

  d. Exposed slopes on the project perimeter dikes should be vegetatively stabilized. Seeding should be scheduled to use early fall rains for germination.

  e. Provision for handling the impact of high groundwater levels on grading operations. Sediment-laden water may need to be pumped to desilting basins before discharged to Novato Creek or the Bay.

  f. Analysis of the hydraulic geometry of the lock discharge area and assessment of the need for erosion resistant lining (such as riprap or concrete wingwalls) of potential impacted areas of Novato Creek.

- To mitigate potential sedimentation impacts, the applicant should prepare operating guidelines for the lock and flushing system through the lagoons. The guidelines should indicate how to prevent sediment-laden inflows to the lagoons, how to efficiently discharge water from the lagoons to maintain creek depths outside the lock, how to regulate incoming flows to best maintain navigable areas, and how to regulate lagoon water surface elevation.

- Prior to beginning the dredge material disposal in the proposed marsh establishment areas, the project engineer should submit detailed plans on the engineering aspects of cell design and operation. Specific information needed by the reviewing agencies to assess the design efficiency may include:

  a. Existing lagoon sediment properties, especially void ratio

  b. Volume of material to be dredged

  c. Efficiency of dredging equipment, such as cutter head and pipeline if that type of equipment would be used

  d. Efficiency of containment cells

  e. Predicted void ratio versus depth profile in the cell afer sediment disposal

  f. Predicted settlement of the cell foundation soil

- If Alternatives C or E are selected, the applicant should submit off-site sediment disposal plans to appropriate agencies for approval.

Footnotes

[1]Rantz, S.E., Precipitation Depth-Duration-Frequency Relations for the San Francisco Bay Region. USGS Open-file Report. Menlo Park, California. 1971.

[2]U.S. Department of Housing and Urban Development. Flood Insurance Study, City of Novato. 1977.

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[6]Oberkamper & Associates. Conceptual Drainage and Flood Control Plan, Bel Marin Keys Master Plan. Job No. 166-80. 1981.

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[8]Cheney, M.H. and R.B. Krone. Study and Recommendations for Improvement of Circulation and Sediment. Bel Marin Keys Community Services District. 1977.

[9]Cheney, M.H. and R.B. Krone. Study and Recommendations for Improvement of Circulation and Sediment. Bel Marin Keys Community Services District. 1977.

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[11]Cheney, M.H. and R.B. Krone. Study and Recommendations for Improvement of Circulation and Sediment. Bel Marin Keys Community Services District. 1977.

[12]Oberkamper & Associates. Conceptual Drainage and Flood Control Plan, Bel Marin Keys Master Plan. Job No. 166-80. 1981.

[13]Applied Science and Resource Planning, Inc. Bel Marin Keys Unit 4 Final EIR. 1975.

[14]Applied Science and Resource Planning, Inc. Bel Marin Keys Unit 4 Final EIR. 1975.

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[16]Rickert, D.A. and A.M. Spieker. Real Estate Lakes. USGS Circular 601-C. Reston Virginia. 1971.

[17]USDA Soil Conservation Service. Draft Marin County Soil Survey. Unpublished, available for review at the Petaluma Field OFfice, SCS. 1981.

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[19]Cheney, M.H. and R.B. Krone. Study and Recommendations for Improvement of Circulation and Sediment. Bel Marin Keys Community Services District. 1977.

[20]Cheney, M.H. and R.B. Krone. Study and Recommendations for Improvement of Circulation and Sediment. Bel Marin Keys Community Services District. 1977.

[21]Cheney, M.H. and R.B. Krone. Study and Recommendations for Improvement of Circulation and Sediment. Bel Marin Keys Community Services District. 1977.

[22]Harlan and Associates. Preliminary Geotechnical Reconnaissance, Bel Marin Keys Unit 5. San Francisco, California. 1981.

[23]Madrone Associates. Revised Restoration Plan, Proposed Bel Marin Keys Residential Development. Novato, California. 1981.

[24]Smith, H.K. "Marsh and Wildlife Development Using Dredged Material: A Proven Alternative." Dredging: Environmental Effects and Technology. World Dredging Cnference Association. San Pedro, California. 1976. pp. 635-647.

[25]Knutson, P.L. "Development of Intertidal Marshlands Upon Dredged Material in San Francisco Bay. Dredging: Environmental Effects and Technology. World Dredging Conference Association. San Pedro, California. 1976. pp. 105-118.

[26]Patin, T.R. "Engineering Aspects of Marsh Development on Dredged Materials." Dredging: Environmental Effects and Technology. World Dredging Conference Association. San Pedro, California. 1976. pp. 471-479.

[27]Massachusetts Institute of Technology. Prediction of Stable Elevation for a Marsh Created from Dredged Material. Prepared for U. S. Army Engineer Waterways Experiment Station. Vicksburg, Miss. 1975.

J. GEOLOGY AND SEISMICITY

Setting - Geology

The site is situated within the Northern California Coast Range Province which, in general, is underlain by a thick and diverse assemblage of rocks of an unsystematic structure, consisting of sandstone (chiefly Graywacke), shale and conglomerate, altered mafic volcanic rocks, chert, limestone, and various metamorphosed rocks. The entire assemblage has been called part of the Franciscan Series, or the "Franciscan Formation."

In the Novato area, the Franciscan is overlain by sedimentary rocks, interbedded sandstones, shales, and conglomerates. The latter rocks are classified as part of the Novato Conglomerate.

It is believed that the Franciscan Assemblage has undergone significant tectonic deformation, faulting, and folding. The formation sequence is no longer coherent. Rock beds cannot be traced with any degree of certainty over long distances.

Almost the entire Bel Marin Keys Unit 5 was once part of the base plain or tidelands on the periphery of San Pablo Bay. The highest point is on the low hill just south of Bel Marin Keys Boulevard and at the extreme west corner of the property. The ground surface elevation, aside from the hill area, ranges from about elevation -4 to -5, based upon mean sea level elevation of zero.

The site has been used for farming. It was reclaimed by building dikes around the periphery of the reclaimed land and along the Novato Creek channel. Drainage is by a series of ditches. The water is pumped into San Francisco Bay and Novato Creek.

The former reclaimed tideland area is overlain by a thick layer of geologically young silty clay alluvium, known as "Bay Mud." Bay Mud is of later Quarternary Age, i.e., deposited during recent geologic time.

Bay Mud is composed of dark grey silty clay and clayey silt with thin layers of silt and fine to medium grain sand, small amounts of organic material and shell fragments. It is a mean grain size on the order of 5 to 10 microns. Tests made on samples from Bel Marin Keys Unit 4 and Hamilton Air Force Base indicate that the liquid limit of the Bay Mud ranges from about 90 to more than 100, and that the plasticity index varies from 43 to 62.

Bay Mud has high compressibility, low shear strength, and low permeability. Bay Mud is common around the periphery of San Pablo and San Francisco Bays, and is occasionally interbedded with lenses of peat and fine sands. It is anticipated that the surface of the Bay Mud on this site is less compressible than the underlying portion of the stratum because of the desiccation that occurred during the historical farming period. It is estimated that the Bay Mud layer in Bel Marin Keys has a thickness up to 50 feet.[1]

Test borings made on Bel Marin Keys Unit 4 immediately north and adjacent ot Bel Marin Keys Unit 5 indicate that the Bay Mud is underlain by geologically older sands and clays. These findings are consistent with numerous investigations made around the periphery of San Francisco Bay. The underlying soils are usually stiffer and consistently stronger than the Bay Mud.[2]

The low hill, called "Headquarters Hill" at the site is believed to be underlain by Franciscan Formation rock. The rock is covered with sand and clays, possibly residual soils.[3]

Judging from investigations made on other Bel Marin Keys units, the groundwater levels vary seasonally from near the surface of the site to near depths on the order of 8 to 10 feet.

Impacts - Geology

The following discussion of geologic impacts and mitigations pertains to all alternatives (A through E). The no project alternative (F) would not have any significant geologic impacts.

Site Settlement - Because of the extreme compressibility of the Bay Mud that forms the near-surface soil, it is anticipated that large settlements will occur in areas that are to be filled as part of the project or where the stresses in the Bay Mud layer will be increased for other reasons (for example, by lowering of the groundwater below current levels or by pumping from those aquifers located below the bottom of the Bay Mud). The amount of settlement will depend upon a number of factors, including the compressibility and thickness of the Bay Mud layer, the magnitude of the stress changes (i.e. the type, quantity, and extent of fill that will be used to raise the grades), and the construction history along the boundary of Bel Marin Keys Unit 5 and older units in the Bel Marin Keys complex.

It is estimated that 13 feet of fill placed on 50 feet of existing Bay Mud (for example, if the site grades are raised from -3 to +10) will settle approximately 4-1/2 feet. Approximately 15% of this settlement will occur in 1 year, half in 10 years and the remainder in about 40 years. The settlement rate will decrease with time. The greatest rate will be during or shortly after construction, and the rate will decrease to less than 1 inch per year near the end of 50 years.

The total amount of settlement is important because it will directly control the height to which the peninsulas and other developed areas will have to be raised to maintain an adequate freeboard above lagoons, and by the same token, the amount of freeboard required on Bayside perimeter dikes to prevent overtopping and subsequent inundation of the low-lying areas by tsunamis or storm flows in Novato Creek.

Differences in total settlement that will occur from point to point are also important for the design of buried utilities, foundations and streets. The site will not settle uniformly because of differences in the thickness and

compressibility of the settling Bay Mud and because of variations of overlying fill throughout the site. Severe differential settlements will occur at the boundary between the older Bel Marin Keys Units and Bel Marin Keys Unit 5.

Potential impacts that total and differential settlements can create are overstressed foundations and buried utilities, wracked building superstructures, reversed gradients in gravity flow pipelines, culverts and other conveyance features, and the development of bumps and hollows in streets.

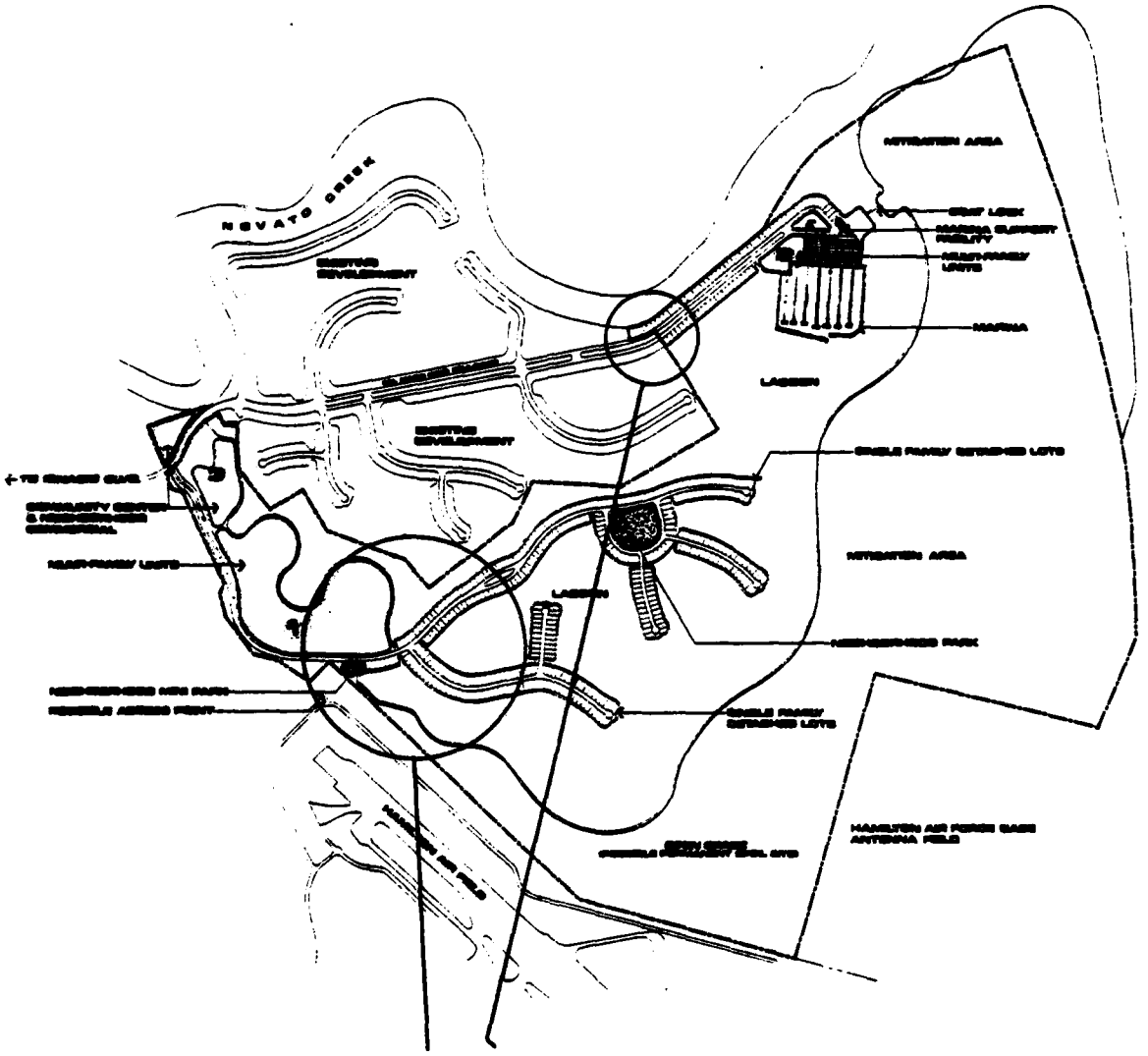
The most sensitive locations with respect to the potential differential settlements are marked on Exhibit J-1.

Slope Stability. Current planning calls for the construction of finger peninsulas and the lagoons in the same manner as those in the older Bel Marin Keys Units 1 through 4. The lagoons will be constructed by excavating from the existing near-level areas and the material (Bay Mud) generated from these excavations will be placed as fill on the peninsulas to raise the grade. Because of the low strength of both natural Bay Mud and the fill composed of Bay Mud, because of the need to raise the fill to a fairly high level (to adjust for future settlements), and because the lagoons will be deep, the stability of the resulting lagoon side slopes around the peripheries of the peninsulas and possibly at the edge of Novato Creek will be potentially unstable. The critical period for stability will be during or slightly after the completion of the excavations, but before the lagoons can be flooded (stability and the potential for movements and deformation of lagoon side slopes during earthquakes are discussed below). Flooding the lagoons will provide a counterbalancing force on the lower portions of the slope and will significantly increase the stability and decrease the landslide potential.

After the lagoon construction has been completed, the lagoons flooded and the proposed project finished, it is probable that the lagoon bank stability will increase with time. As the consolidation of the Bay Mud takes place, the fill areas will settle, decreasing the grade changes between the top of the developed areas and the bottom of the nearby lagoons. This will add to the stability. Furthermore, consolidation gradually increases the strength of the consolidating soil, a fact which will also add to the stability and decrease the potential for a landslide to occur.

An analysis of the stability of a slope composed of natural Bay Mud and Bay Mud fill, inclined at 4 horizontal to 1 vertical and 21 feet high, (i.e., from a ground surface at +10 at the lagoon bank crest to -11 at the lagoon bottom) and based upon strength data available in the geotechnical investigation report for Bel Marin Keys Unit 4 indicates that the slope will fail.[4] This is before the slope can be flooded with lagoon water.

The results of the foregoing analysis are supported by the fact that three landslides have taken place during construction of the lagoons in Bel Marin Keys Unit 4. It is probable that the strength of the Bay Mud in Bel Marin Keys Unit 5 is similar to that in Unit 4. Because the strength of the Bay Mud will



Project locations where differential settlements will need to be considered for utility and foundation design.

Source: Hallenbeck-McKay & Associates, 1982

TORREY & TORREY INC. environmental/urban planning and design	Areas of Possible Differential Settlement	EXHIBIT J1

control the stability of lagoon slopes, failures are probable in Bel Marin Keys Unit 5 if the lagoon construction program and bank configuration is the same as in Bel Marin Keys Unit 4.

Dredged Materials Disposal. The placement of dredged materials on unimproved low-lying areas in Bel Marin Keys Unit 5 should cause settlement of these areas. The weight of these materials would consolidate the underlying undisturbed natural Bay Mud in the same manner as in the project fill areas. The amount of settlement would probably be less than beneath project fills if the thickness of the deposited material is less. However, the rate of settlement will be quite different because the deposition will be periodic and not completed at one time, as will be the case in the improved sections of Bel Marin Keys Unit 5.

Lagoon Bank Erosion. The lagoons will be open bodies of water and the banks will be subject to erosion by the action of waves generated by motor-driven boats and storm winds. Such erosion would be unsightly and add to the siltation of the lagoons. In the long run, enough erosion would decrease the stability of the lagoon slopes.

Both the natural and Bay Mud fill should be relatively erosion-resistant and, therefore, the impact of small waves on the erosion potential of the banks should not be large. The experiences of other Bel Marin Keys units would be relevant for evaluating the chances of bank erosion in Bel Marin Keys Unit 5. (See also Section I Hydrology, Erosion and Water Quality)

Mitigation Measures - Geology (Developer Responsibility)

- Site Settlements. The total and differential settlements that can be expected to occur on the subject site should be assessed by detailed geotechnical engineering studies. These studies should include not only a thorough review of the historical settlement data derived from measurements made in the older Bel Marin Keys units, but also analyses based upon theoretical models incorporating state-of-the-art methods and test data from laboratory consolidation tests performed on high-quality samples obtained from borings drilled in the Bel Marin Keys Unit 5. Reliance should not be placed solely on the historical record of Bel Marin Keys Units 1 through 3 because of possible and even likely variations in compressibility, degree of consolidation and overconsolidation, and thickness of the Bay Mud.

  The design of utilities and other improvements should allow for differential settlements where the effect is that differential settlements will have on the improvements are important, as could be the case for gravity-flow storm and sanitary sewers. In this regard, it is noted that the utility connections at the boundary of older units and Bel Marin Keys Unit 5 will not be "sheared" because of the change in stress history. The connection can be expected to settle as a unit. However, that portion of the utility within Bel Marin Keys Unit 5 will probably settle more and in the older units less than at the connection, and the resulting differential settlement should be accounted for in utility planning.

Foundations for structures located in areas of predicted differential settlement and possible heave movements should be adequately strong so that the structures are not damaged by the movements.

Foundations for structures on the site should consist of grade beams - footings bearing within the compacted fill. Grade beams should be laid out in a grid line pattern which ties all the foundation elements in two directions to help resist deflections resulting from differential settlements. Slab-on-grade foundations either post-tensioned or conventionally reinforced bearing on the compacted fill should also be suitable, provided that they are designed to accommodate the expected differential settlements. The design study should include estimates of differential settlements on each lot and recommendations for designing the foundations to account for differential settlements. Ground elevation variations under and adjacent to buildings should be minimized in order to reduce the differences in load caused by the fill.

Driven pile foundations carried through the younger Bay Mud and deriving their support from the stiffer soils below the mud would also prevent potential problems for buildings caused by differential settlement of the surface fills. However, driven piles would have the adverse impact of appearing to "rise" out of the ground as the surrounding ground settled away from the stable and unmoving foundations.

- Slope Stability. The potential for slope stability failures should be evaluated carefully during the investigation phase of Bel Marin Keys Unit 5. This evaluation should include careful testing of undisturbed Bay Mud samples and compacted fill materials and state-of-the-art slope stability analyses.

  The adverse impact that landsliding would have can be mitigated by reducing the height of the lagoon banks, flattening the bank slopes, constructing the lagoons while partially or fully submerged, and possibly, by utilizing imported light-weight fills in lieu of the excavated Bay Mud used on the other Bel Marin Keys units.

  The total height of the lagoon slope as measured vertically between the lagoon bank top and bottom of the lagoon is the most significant variable controlling the lagoon bank stability. The potential for slope failure can be lessened by decreasing the height. If the lagoon banks are inclined at 4 horizontal to 1 vertical, it is estimated that the change in elevation should not exceed 16 feet for an adequate factor of safety to be achieved. This should be done by making the bottom elevation of the lagoons -6 if the top of the banks are at elevation 10.

  The angle at which the lagoon banks are inclined can be flattened to increase the bank stability. It is estimated that the slope inclination should not be steeper than about 8 horizontal to 1 vertical. If the grade change between the bank top and lagoon bottom is 21 feet.

The adverse impact on the slope stability also can be mitigated by excavating the lagoons while keeping them submerged. However, this would make the handling and compaction of the Bay Mud fill more difficult and would increase the turbidity of the lagoon water. It would be possible to excavate portions of the lagoons in the dry, leaving stabilizing berms in place between each excavated portion and then remove the berms after the lagoons between the berms have been excavated.

Light weight fill would reduce the impact of the weight that the new fill has on the soft Bay Mud foundation soils. If the bank height is made 21 feet, it is estimated that the imported new fill would have to weigh approximately 75% of the Bay Mud fill itself in order for this to be an effective method for improving the construction slope stability.

- Dredged Materials Disposal. No specific mitigation measures are recommended for the dredged materials sites if no structural improvements are planned for these areas.

- Lagoon Bank Erosion. The erosion potential of the lagoon banks should be studied in connection with the potential wave sizes. Because the lagoon fetch is short, the wind-created wave runup should not be significant. However, the amount of runup should be less than the freeboard of filled areas, including in such calculations the anticipated amount of site settlement.

  Erosion can be eliminated by lining the exposed slopes with riprap or by commercially available erosion-resistant products, or perhaps by planting the slopes with erosion-resistant materials. In this regard, the findings of the planned test of erosion-resistant plants in Bel Marin Keys Unit 4 should be used as a guide in Bel Marin Keys Unit 5. Any comparison with previous experience should include differences in lagoon sizes.

Setting - Seismicity

The Bel Marin Keys Unit 5 site is located within an area of recent intense earthquake activity. Historic earthquakes have been reported in 1836 and 1868 emanating from the Hayward Fault, approximately 10 to 15 miles to the south and east of the site, and 1906 on the San Andreas Fault Zone, approximately 15 to the west of the site. Geologically newer active faults identified in the immediate area, which could be the source of earthquakes that influence the Bel Marin Keys unit 5 site, are the Healdsburg Fault, approximately 36 miles to the north, the San Pablo Fault, approximately 10 miles to the south, and the Green Valley/Calaveras Fault, approximately 20 to 25 miles to the east of the site.

The Richter Magnitude for maximum probable earthquakes emanating from the Hayward and San Andreas Faults (the largest fault systems in the area of the site) are 7 and 8-1/4, respectively. The recurrence intervals for these earthquakes is estimated to be 100 years.

Impacts - Seismicity

The following disucssion of seismic impacts and mitigations pertains to all alternatives (A through E). The no project alternative (F) would not have any significant geologic impacts.

Earthquake. Earthquake-created ground shaking would induce forces in structures located on the site and decrease the stability of lagoon bank slopes. Seismic waves passing through Bel Marin Keys Unit 4 during an earthquake could lead to lurching or heaving of the ground surface and consequent damage to buried utilities and surface improvements.

An earthquake emanating from any fault underlying the site would induce shear type displacements at the ground surface. The probablity of an earthquake fault underlying Bel Marin Keys Unit 4 has been studied by Gasch & Associates.[5] The results of the study would be applicable to Bel Marin Keys Unit 5. They indicated that it is possible that minor, active, faults underlie the site. The potential for fault displacement at the ground surface in Bel Marin Keys Unit 5 is judged to be extremely small and not a potential impact.

Severe earthquake shaking would liquefy susceptible soils.

It is noted that the deep layer of soft Bay Mud will tend to attenuate high-frequency ground motions and reduce the ground surface accelerations to below the acceleration levels in the bedrock underlying and adjacent to Bel Marin Keys Unit 5. The ground surface accelerations at the extreme west end of the site would be larger than in the center for this reason. It is estimated that the fundamental period of the soil deposit underlying Bel Marin Keys Unit 5 is greater than 2 seconds, except at the west end, where the fundamental site period of the hill area will be 1/2 second or perhaps less. The proposed buildings probably will have fundamental periods less than 1/2 second. Thus, a resonance condition between the structures on the site and the underlying soil deposit are not likely to develop except for those buildings located on the hill.

It is probable that the lagoon bank slopes would suffer some deformation if the site were subjected to a long-duration, and consequently high-magnitude, earthquake. The deformation is caused by internal forces which momentarily exceed yield acceleration levels of the Bay Mud and fill.

Bay Mud is itself not a liquefiable material and, therefore, liquefaction is not a potential impact unless sand is present.

Tsunami. The potential impact of a tsunami or sea wave would be to overtop the existing perimeter dikes and inundate all of the low-area. Such a wave would not have a destructive force, but would have the characteristics of a flood. The impact on improvements would be negligible if the project ground elevations are always above the projected tsunami level.

Mitigation Measures - Seismicity

- Earthquake. The impact of seismic shaking on structures should be evaluated by the geotechnical and engineering consultants for the project. The buildings should be designed for potential forces. The consultants should determine if the shears and moments mandated by the Uniform Building Code are adequate for the site conditions.

  The amount of seismically-induced deformation should be the subject of a detailed geotechnical engineering analysis which includes a review of the studies done on Bel Marin Keys 4. The zone of influence of such deformations in the area of the lots close to the top of the lagoon banks should be carefully evaluated. Determining a safe setback for buildings should be the subject of this analysis so that buildings are sited beyond the zone of significant movement.

  The amount that the buildings will need to be set back from the tops of the lagoon banks will depend upon the results of the analysis discussed in the foregoing paragraph and the amount of deformation that the proposed buildings can safely undergo without being a hazard to the building occupants. It is estimated that the amount of deformation that the lagoon bank could undergo near the crest of the bank could be several feet and perhaps as much as a foot at a distance of 50 feet from the lagoon crest. It is noted that a building set-back of 75 feet was utilized for a bayside project in Alameda with somewhat similar soil conditions.

  Liquefaction of sand layers embedded within the matrix of Bay Mud could be important for the lagoon bank stability because the very low strength of such liquefied sand would reduce the resistance to sliding. Therefore, enough borings should be made within the project to determine whether continuous sand layers exist within the Bay Mud and, if so, the locations of the layers. The potential impact that liquefaction induced in sand layers in the Bay Mud should be analyzed by further geotechnical engineering studies and a comparison with the studies done for Bel Marin Keys 4.

- Tsunami. The present and future elevations of the perimeter dike should be compared to the potential highwater level of the design tsunami. Such an evaluation should include an estimate of the future settlement of these dikes, which would be particularly applicable if the dikes are located on thick deposits of Bay Mud if they are also made up of uncompacted Bay Mud. A similar evaluation should be made with respect to the elevations of project improvements, noting that the minimum elevations will be after the consolidation settlement of the Bay Mud has been completed. A small extra freeboard should be included between the highest level of the design tsunami and the lowest level of the project improvements (after settlement has been completed) to act as a factor of safety. This would be to account for unknowns in the engineering estimates of settlements and of the tsunami wave heights.

Footnotes

[1]R. C. Harlan & Associates, "Preliminary Geotechnical Reconnaissance, Bel Marin Keyes Unit V, Marin County, California," 15 April 1981.

[2]R. C. Harlan & Associates, "Geotechnical Investigation, Bel Marin Keyes Unit IV, Marin County, California," January 1979.

[3]R. C. Harlan & Associates, 1981.

[4]R. C. Harlan & Associates, 1979.

[5]Gasch & Associates, "Bel Marin Keyes Geologic Seismic Report," undated.

K. SOILS AND AGRICULTURE

Setting - Soils and Agriculture

Soil Series. Most of the Bel Marin Keys 5 site is overlain by soils of the Reyes Series. These soils are characteristically 2 feet below to 10 feet above mean sea level and are derived from mixed sources principally Bay Mud alluvium. Typically, the surface layer is light brownish gray clay about 14 inches thick. See Section J. Geology and Seismicity for further description of Bay Mud and Section I. Hydrology, Water Quality, Erosion and Sedimentation for erosion characteristics.

The Reyes clay on the site has a capability grouping of IV w-9.[1] Capability grouping shows in a general way the suitability of soils for agricultural use. (See Appendix IV for a complete description of capability grouping.) The Roman numeral (IV in this case) indicates the capability class. Class IV soils generally have severe limitations that reduce the choice of agricultural plants. They may also require very careful management. Classes I and II are considered prime agricultural soils by the USDA Soil Conservation Service. The "w" represents a capability subclass and indicates that water in or on the soil interferes with plant growth and cultivation. The "9" is a capability unit within the subclass and indicates a problem or limitation caused by low fertility, acidity, or toxicity.

The primary agricultural limitations of Reyes clay are the seasonally high water table and highly acid soil conditions under altered drainage. The pH soil reaction generally ranges from 3.6 to 6.5 and often results in toxic conditions (pH of 7.0 is neutral). Salt may also be present and may create problems for some crops. Small grains and forage crops which can tolerate salt and acidity are the only crops suitable for this soil type. The main crop is usually oat hay for silage, and the average expected yield is about 1.5 tons per acre.[2] For non-irrigated pasture, the expected yield is about 1.6 animal-unit-months[3] per acre.[4]

The severe limitations of Reyes clay indicate that these soils would not be considered prime or unique agricultural lands as defined by the U. S. Department of Agriculture.[5] However, there are several factors which give the proposed Bel Marin Keys 5 site local importance even though the soils have such limited capabilities.

Drainage. The site has been in agriculture production on a leased basis for many years with the cumulative result of creating an extensive and efficient system of drainage ditches. Water in the upper soil layers generally drains laterally into the ditches resulting in an expanded root zone. The water in the ditches is pumped into San Pablo Bay thereby lowering the water table further. Many of the agricultural fields in the area do not have such an effective drainage system. Therefore, the Bel Marin Keys 5 site is probably one of the best areas for controlled drainage on the Novato plain.

Hauling Distance. The site is within a relatively short hauling distance to local dairies. This short haul route and the suitability of the soils for oat hay give the site unique characteristics for agricultural feed production. Usually between 5 and 7 Novato area dairy farms receive oat hay silage from the site. This accounts for about 50 percent of the roughage requirement of each dairy. The silage is generally made from oat hay which is cut when still green. The early cutting, usually in May, results in a higher nutrient value. It is hauled by truck (10-12 tons/truck) and piled for anaerobic (without oxygen) decomposition to create silage. Baled hay and grains are also produced on the site and are generally more easily transported longer distances, i.e., West Marin and Southern Sonoma. All feeds grown in Marin are important to the local dairies because there is more feed consumed by the 65 Marin dairies than is produced within Marin County. The result is a strong dependence on imported feed.

Crop Yields. The crops which have been grown on the site within the last 4-5 years include oats with vetch and clover, baled hay, oats for grain and silage, and wheat. The two parcels are generally on one year leases to local farmers who cultivate a single non-irrigated crop. Recently, oat hay has been cultivated on about 1421 acres of the site.[6] This represents nearly 26% of the reported total acreage in Marin County that is in hay, grain and silage production.[7] A recent yield from the site was 5,684 tons of oat hay which is also 26% of the total reported yield of hay, grain and silage for the entire county in 1979. Exhibit K-1 summarizes the recent yields from the site and compares them with reported county figures.

Exhibit K-1

Hay, Grain and Silage Production

	Harvested Area	Yield	Average Yield per Acre
Bel Marin Keys 5 Site	1,421 acres	5,684 tons	4.0 tons/acre
Marin County (1979)	5,400 acres	20,100 tons	3.7 tons/acre

Sources: Shiloh Resources, 1981.
Marin County Agricultural Crop Report, 1980.

The average yield from the County and from the site is considerably higher than the expected yields established by the USDA Soil Conservation Service for Reyes clay soil. This possibly indicates that some limitations of the soil capability may not apply to this site.

Using good agricultural practices, one farmer has reported yields as high as 15-16 tons/acre for oat hay silage produced on the site.[8] Fertilizer applications of nitrogen (urea in pellet form) and phosphorus (phosphates in pellet form) have increased yields significantly. The most effective nitrogen applications have been done by helicopter in late winter and early spring. Phosphorus applications are generally done in the fall during tillage. Herbicides have been used infrequently and are generally not considered necessary for oat hay silage. For grain production, aerial application of herbicide (liquid 2,4-D) has been necessary.

Sewage Effluent. The Novato Sanitary District in conjunction with the Marin County Flood Control and Water Conservation District and Rohnert Park Farms has experimented with the use of treated sewage effluent for summer irrigation of forage crops. Summer irrigation in this manner made double-cropping feasible. A pilot project on 66.5 acres in 1977-78 tested barley and also field corn (silage).[9] Yields were relatively low for both crops. A comparison of farming costs and crop values indicated that unless the crop yield can be increased, growing barley for grain in this particular area is not economical. Growing barley for silage may have resulted in higher crop value, but costs still would not have been offset. There were many factors which caused the low yields in this particular project, and most of these could be corrected. Other test programs have shown that sewage effluent supplies sufficient nutrients to reduce the need for fertilizers. However, the effluent's primary value is as a water source in the summer rather than a nutrient source. It appears from the pilot program that double-cropping is possible, but economic feasibility would depend upon good irrigation management and maintenance of proper agricultural practices.

The site of this test project was just north of Highway 37 and east of Novato creek. Soil characteristics are similar to the Bel Marin Keys 5 site, and the force main sewer outfall which provided the water source for the pilot project follows the property line between the proposed project and Hamilton Air Force Base.

Therefore, it appears likely that the Bel Marin Keys 5 site would have a high potential for double-cropping during the summer if irrigation could be provided by sewage effluent from the sanitary district.

In 1976, the Bel Marin Keys 5 site was used in a 370 acre test program using sewage effluent for irrigation.[10] The effluent was pumped into open ditches which traversed the property and was then pumped into a wheel-line irrigation system. Oat hay was planted and harvested with yields of about 2 tons per acre. Several factors contributed to the low yields including (poor irrigation management, late harvesting, etc.) There were also problems with increased mosquito populations due to the presence of standing water in the ditches. These problems would have to be solved if double-cropping with effluent were to become a standard practice.

At this time, the Novato Sanitary District has already selected an 850-acre area to use the effluent for summer irrigation in order to comply with the Regional Water Quality Control Board's discharge requirements.[11] However, federal funding for the project is uncertain. If funding is not available, alternative financing and selection of another site is possible. The Bel Marin Keys 5 site could be a candidate.

Many of the parcels north of the site are in agricultural use. The Marin County Flood Control and Water Conservation District owns significant portions of the area between Highway 37 and Novato Creek and leases some parcels to local farmers. One parcel (AP 157-16-10) is still under an agricultural preserve contract which would prohibit development of the site for 10 years if it were in private ownership. However, since the property is held by a public agency, the agricultural preserve contract has no significance. No other properties in the immediate vicinity are under agricultural preserve contracts with the county.

Impacts - Soils and Agriculture

Alternatives A, B, and D would eliminate all agricultural uses on the site. The soil layer would be excavated to form the lagoon and building pads. All remaining open space would either serve as a dredged materials site or would eventually be restored to tidal salt marsh thereby eliminating agricultural use of the mitigation area. The result of discontinued agriculture would be about a 26% reduction in hay, grain and silage produced and in acreage under cultivation for these crops within Marin County. For these alternatives, this is an unavoidable adverse impact.

Alternative C would permit continued agricultural use of 875 acres. Continued cultivation of oat hay would result in at least 3500 tons per year. Based on the 1979 production year, this would be a 10% reduction in total hay, grain and silage produced and would also be an unavoidable adverse impact.

Alternative E would preserve a large portion of the existing agricultural area. A total of about 1066 acres would be preserved for agricultural use. With continued oat hay cultivation, yields would be about 4264 tons per year. This is a reduciton of about 1420 tons per year over the existing yield for the site and only a 7% reduction in total yield of hay, grain and silage for the county. Such a reduction in agricultural productivity is considered significant only as a cumulative impact.

Exhibit K-2 summarizes the impacts of the proposed project and alternatives on agricultural acreage. Alternatives A, B and D all have unavoidable impacts on agriculture which cannot be mitigated to a level of insignificance. The adverse impacts relate directly to hay grain or silage production, because cultivation of other crops on the site is not feasible due to soil limitations and economic factors. Implementation of Alternatives C or E would mitigate somewhat the significant loss of agricultural lands due to project development. The agricultural impacts of either of these two alternatives would be significant only as cumulative impacts, in terms of overall impacts on hay, grain, and

Exhibit K-2

Comparison of Alternatives Reflecting Loss of Agricultural Acreage Within Marin County*

Alternative	Developed Acreage	Open Space/ Salt Marsh Acreage	Preserved Agriculture Acreage	% Reduction Hay Grain Silage Acreage	% Reduction Total Agricultural Acreage	Adverse Impact on Agriculture
A (As Proposed)	735	875	0	26%	1.0%	Unavoidable
B (No Marina)	735	875	0	26%	1.0%	Unavoidable
C (Off-site Mitigation)	735	0	875	10%	0.4%	Unavoidable (Cumulative only)
D (Reduced Project)	544	1066	0	26%	1.0%	Unavoidable
E (Reduced Project Off-site Mitigation)	544	0	1066	7%	0.3%	Unavoidable (Cumulative only)
F (No Project)	0	0	**1610	0%	0%	No impact

*Based on 1980 Marin County Agricultural Crop Report
**Actually only 1421 acres of the 1610 acre site have been in cultivation.

Source: Torrey & Torrey Inc.

silage acreage in Marin County. Alternative F (No Project) is the only alternative which would allow continued agricultural use of the entire site. Therefore, from the standpoint of lost agricultural acreage, it is the only alternative without adverse impacts.

The Marin Agricultural Land Trust (MALT) currently estimates a 13-18% conversion of Marin agricultural lands to non-agricultural uses over the next 20 years.[12] The implementation of Alternatives A, B, or D would result in a 1.0% loss of total agricultural land in Marin County, and Alternatives C and E would convert about 0.4% and 0.3%, respectively. The 1.0% loss would exceed the yearly average estimate of agricultural land losses (0.7 - 0.9% of the present average). When this 1.0% loss is added to other projects which involve agricultural land conversion, the cumulative impacts could be severe. The use of diked agricultural land for creating residential developments would continue the precedent which was set with the construction of Bel Marin Keys I-IV. This precedent essentially influences public agencies (such as Marin County Flood Control) to acquire lands in order to control development, especially in flood prone areas.

The type of development proposed for each alternative appears to be compatible with nearby agricultural practices. Novato Creek serves as an effective buffer between the residential and agricultural areas north of the site. The existing development is relatively compatible with the forage crop agricultural practices which require minimal aerial spraying. The existing lagoons also serve as effective buffers between residences and agricultural areas.

Mitigation Alternatives - Soils and Agriculture

- Implementation of Alternatives C or E would reduce the impacts on agriculture to a level where agricultural use of the mitigation area would still remain feasible. The preserved agricultural acreage (875 acres for Alternative C; 1066 acres for Alternative E) would still be economically feasible for hay, grain or silage production. If this preserved area could then be placed within a designated conservation easement, long-term leases would be possible. Extended leases would encourage various improvements such as levee maintenance, drainage systems, and irrigation systems for sewage effluent, etc., which would be initiated by the farmer. The Marin Agricultural Land Trust would be willing to manage the farming enterprise if the long-term conservation easement were implemented or the lands were dedicated to the County.[13]

- The Marin County Zoning Ordinance (22.47.106) provides a system of transferred development rights (TDR) which may be feasible to relocate potential development and minimize impacts on agricultural lands. The TDR process allows development rights from one property to be determined and transferred to a second property. The submission requirements are outlined in the zoning ordinance along with the conservation easements and restrictions which would apply.

A primary limitation of TDR use in Marin County is the limited amount of developable land to which development rights could be transferred. The transfer of development (density) within the 1610-acre site appears reasonable, but the transfer to another site with sufficient acreage is probably unrealistic.

Footnotes

[1]USDA Soil Conservation Service, Soil Survey of Marin County (unpublished preliminary draft, 1982).

[2]USDA Soil Conservation Service.

[3]One animal-unit-month is the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.

[4]USDA Soil Conservation Service.

[5]Federal Register Vol. 43, No. 21, January 31, 1978, pages 4030 - 4033. Part 657 - Prime and Unique Farmlands.

[6]Shiloh Resources, 1981.

[7]County of Marin. Annual Livestock and Agricultural Crop Reports. 1978, 1979, 1980.

[8]Ralph Grossi, Board of Directors, Marin Agricultural Land Trust, Telephone Interview, May 7, 1982.

[9]Joseph, C.A. and D.L. Bittson, "Report on Forage Crop Demonstration Project 1977-78," Novato Sanitary District, Marin County Flood Control and Water Conservation District, Rohnert Farms, December 1977.

[10]Charles Joseph, District Manager-Engineer; Novato Sanitary District, Telephone Interview, May 11, 1982.

[11]Charles Joseph, May 11, 1982.

[12]Paul Maxwell, Executive Director, Marin Agricultural Land Trust, Telephone Interview, May 5, 1982.

[13]Ralph Grossi, Telephone Interview, May 7, 1982.

L. VEGETATION AND WILDLIFE

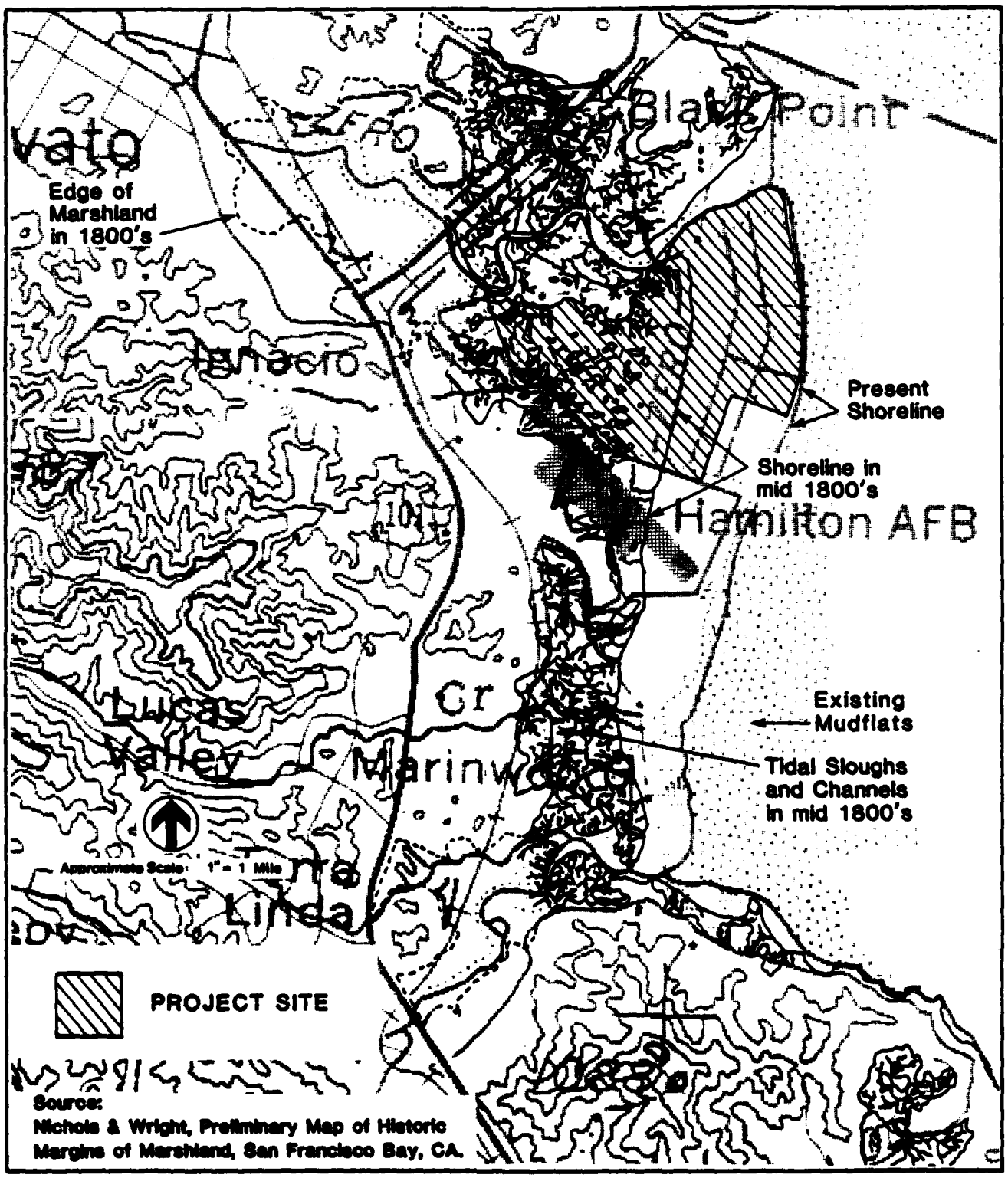
Setting - Vegetation and Wildlife

Most of the Bel Marin Keys area is within the historic marsh margin of San Francisco Bay. Exhibit L-1 indicates those portions of the Bel Marin Keys 5 site which supported marshes and those which were covered by San Pablo Bay in the 1850's. The filling of the easterly portion of the property was partially a result of hydraulic mining which deposited large amounts of sediment around San Pablo Bay. These deposits formed young marshes which were diked in the late 1800's and early 1900's. Construction of an extensive system of drainage ditches and levees permitted dry land farming. Surface subsidence of these diked areas has been dramatic in some areas with surface elevations lowered from 4 to 9 feet below MHHW, depending on the age of the marsh when diked and time elapsed since diking. The Bel Marin Keys 5 site is a prime example of low elevation diked historic bayland that is currently used for dry land farming.

The dominant habitat on the Bel Marin Keys 5 site is unirrigated agricultural fields. There are also two small ponds (one seasonal) and ruderal areas of abandoned agricultural lands. The surrounding adjacent habitats, specifically, Novato Creek, the marsh/mudflat areas of San Pablo Bay and a protected wildlife area along the western boundary of the site, are significant for local wildlife populations.

The presence of wildlife on the site was well documented in a wildlife census in 1980.[1] (The wildlife census which contains species lists, and other data is contained in Appendix V). The primary emphasis of the census was on birds species and their correlation with the existing habitats. The eleven-month census showed that bird use on the site varies greatly among the habitat types and that the amount and type of use was strongly affected by seasonal and agricultural events such as flooding, plowing, and burning. The pond habitat had the greatest number of bird species observed (51) followed by the seasonally flooded fields (46), ruderal fields (37), and dry fields (35). The pond also supported the highest average number of individuals over the census period.

Seasonal Wetlands. Seasonal flooding generally increases the habitat value of agricultural fields since it provides areas for water-associated wildlife during the winter. Although these areas do not support characteristic wetland vegetation, they are important as "seasonal wetlands" because of their short-term value as 1) substitute feeding habitat for water fowl dependent on true wetlands; 2) breeding grounds for amphibians; and 3) resting areas for shore birds when high tides cover adjacent mud flats.[2] The brief period of time that the seasonal wetlands have standing water coincides with periods of maximum concentration of waterfowl and shorebirds in the Bay Area. Many soil organisms and insects thrive in the surface water where they become an important food source for migrating and resident species. Seasonal wetlands have increased in importance due to the diminishing acreage of perennial wetlands around San Francisco Bay.



TORREY & TORREY INC. environmental/urban planning and design	Historic Margins of Marshland	EXHIBIT L1

The 1980 census of the site identified about 360 acres as seasonally flooded. These acres are generally low in elevation (-4.5 ft. NGVD)[3] and they collect rainwater unless regularly pumped. There are two automated pumps on the Bel Marin Keys 5 site which normally discharge the collected rainwater to San Pablo Bay and Novato Creek. However, during the entire winter of 1980 (time of wildlife census), one pump was not functioning. With a slightly higher than normal rainfall and reduced pumping, the extent of the seasonal wetlands was probably greater in 1980 than it would have been during an average year.[4]

A record search of aerial photographs, topographic surveys and historical documentation indicates that the area identified as seasonally flooded in the 1980 census is probably the area where flooding occurs regularly. This area is slightly lower than other portions of the site and, if the pumps are not functioning properly, rainfall is likely to collect in this location.

Exhibit L-2 indicates the habitat acreages based on the 1980 census report. Given the evidence uncovered in the record search, these acreages are probably a reasonable estimate of current seasonal wetland habitat.

Exhibit L-2

Habitat Acreage of Bel Marin Keys 5 Site

Wetland and Seasonal Wetland Acreage	
Flooded Agricultural Fields (seasonal)	360 acres
Pond (year-round)	30 acres
Pond (seasonal)	20 acres
Subtotal	410 acres
Non-Wetland Acreage	
Upland Residential	10 acres
Dry (drained) Agricultural Fields	1140 acres
Dry (drained) Ruderal areas	50 acres
Subtotal	1200 acres
Total	1610 acres

Conservation Zones. The Marin Countywide Plan (April 1982) designates the entire Bel Marin Keys site within the Bayfront Conservation Zone (Diked Bay Marshland and Agricultural Subzone) and a 100 foot buffer strip along Novato Creek within the Stream and Creekside Conservation Zone (Stream Conservation Area). See Section D, Land Use and Appendix I for further discussion of policies within these zones. Three policies for these zones which are particularly relevant to vegetation and wildlife are:

1) protection of diked agricultural land

2) retention of large tracts of land as possible land banks to protect wetland habitats and maintain restoration potential

3) prohibition of residential development within the Stream Conservation Area

All of the conservation zone areas are lands with water access. Special development restrictions and standards have been established to prevent environmental deterioration and loss of this scarce natural resource.

Habitat Evaluation Procedure. A modified Habitat Evaluation Procedure (HEP), developed by the U. S. Fish and Wildlife Service (FWS), was completed on the site in November 1980 by Madrone Associates to determine the relative carrying capacity of the various habitats for selected wildlife species, and the compensation necessary for loss of the existing habitats.[5] The existing habitat conditions were rated relative to optimum regional habitat conditions using a Habitat Suitability Index (HSI) rating for representative species. The HSI was multiplied by the total acreage of each habitat to determine the number of Habitat Units (HU) for that species. HU's provide a measure of existing habitat value and project impacts can be determined by calculating the changes in HU's expected to occur both with and without a proposed action.

Upon review of the Madrone Associates Study, the relevant review agencies have expressed concern about use of the HEP method for evaluation of the existing habitat and for establishment of appropriate compensation. The Department of Fish and Game (DFG) does not normally use HEP in evaluating project impacts or for proposing compensation, and the FWS considers use of the HEP inappropriate where endangered species are concerned. Both DFG and FWS have expressed concerns that the HEP was not performed with a multi-agency perspective and that no local, state or federal agencies were directly involved in the procedure. The participation of regulatory agencies (i.e., DFG, FWS, Corps of Engineers, Marin County) in the HEP would result in interagency consensus about habitat values and greater agreement in the evaluation of proposed mitigation measures.

Endangered Species. No endangered species have been reported from the interior portions of the Bel Marin Keys 5 site. However, the permanent marshes in the surrounding area along Novato Creek provide habitat for the California clapper rail (*Rallus longirostris obsoletus*) and the salt marsh harvest mouse (*Reithrodontomys raviventris*) both classified as endangered by the DFG and the FWS. The FWS is currently working on a recovery plan for the clapper rail and salt marsh harvest mouse which will probably involve Novato Creek adjacent to the project site. Designation of the creek area as critical habitat for this species would restrict any development along the southern bank of the creek.

California Department of Fish and Game. The DFG has responsibility for managing the San Pablo Bay State Wildlife Area which is located along the eastern property line of the Bel Marin Keys 5 property. The wildlife area,

12,320 acres of primarily open water on San Pablo Bay, is open to public use for recreational purposes. The northern boundary of the area adjoins the San Pablo Bay National Wildlife Refuge administered and managed by the FWS.

The DFG has jurisdiction over the Bel Marin Keys 5 site by authority of the Fish and Game Code Section 1603 regarding stream bed modification (in this case any proposed activities along the bank of Novato Creek). In addition, it serves as a review agency for Army Corps of Engineers permit applications. The department reviews projects to determine conformance with the Basic Wetlands Protection Policy[6] of the Resources Agency and the San Francisco Bay Management guidelines.[7]

The Basic Wetlands Protection Policy states that the Resources Agency, its Departments, Boards and Commissions, will not authorize or approve projects that fill or otherwise harm or destroy coastal, estuarine, or inland wetlands.

Exceptions to this policy may be granted provided that all the following conditions are met.

1. The proposed project must be water-dependent or an essential transportation, water conveyance or utility project.

2. There must be no feasible, less environmentally damaging alternative location for the type of project being considered.

3. The public trust must not be adversely affected.

4. Adequate compensation for project-caused losses shall be a part of the project. Compensation, to be considered adequate, must meet the following criteria:

   a. The compensation measures must be in writing in the form of either conditions on a permit or an agreement signed by the applicant and the DFG.

   b. The combined long-term "wetlands habitat value" of the lands involved (including project and mitigation lands) must not be less after project completion than the combined "wetlands habitat value" that exists under pre-project conditions.

The following San Francisco Bay Management Guidelines assist the DFG in reviewing projects within the historic marsh margins of San Francisco Bay.

1. All areas of historical tidal marsh should be restored to productive fish and wildlife habitat wherever feasible.

2. Existing agricultural uses within the historical marsh margin and adjacent areas are compatible with habitat protection objectives and are encouraged to continue. Upon cessation of such uses, those areas should be restored or upgraded to the highest habitat value for the fish and wildlife of the Bay.

3. Ruderal and other undeveloped areas adjacent to existing wetlands should be preserved as open space for wildlife, with recreation uses encouraged, consistent with protection of wildlife habitat values.

4. Development in wetlands may be permitted if such development is dependent upon a waterfront site, provided that there are no other less environmentally damaging alternatives. Additionally, only those portions of projects which are actually water-dependent will be permitted.

5. The net volume and tidal surface of the Bay should not be reduced by permitted development. Any reduction in surface or volume should be offset by restoration of a comparable area in terms of size and value to fish and wildlife.

6. Permitted development on diked but unfilled historic marsh which results in permanent loss of an area having potential fish and wildlife habitat values must be offset by restoration of an area of comparable size and value.

Generally, the DFG evaluates projects on an individual basis in an effort to identify significant habitat acreages (instead of using HEP). A policy of acre-for-acre compensation is usually applied to projects which eliminate significant habitats such as wetlands and seasonal wetlands or areas of diked historic baylands. Various combinations of on-site and off-site mitigation packages have been individually established by agreement between project developers and the DFG.

U.S. Fish and Wildlife Service. The Fish and Wildlife Service (FWS), Department of the Interior, is the Federal agency responsible for preserving, protecting and enhancing fish and wildlife resources. The Congressional Acts and Executive Orders[8] under which the FWS has been given this responsibility have been formed into the following policies which the Service uses to review all proposed projects.

1. The Service encourages all efforts to preserve, restore and improve the fish, wildlife, aquatic and wetland ecosystems and assists in the preservation of other environmental resources.

2. The Service actively discourages activities and developments in or affecting the nation's waters and wetlands which would individually or cumulatively, with other developments on a waterway, unnecessarily destroy, damage or degrade fish, wildlife, aquatic and wetland ecosystems.

3. It is the Service's position that there exists a national recognition that wetland and shallow water habitats have such high ecological and social values as to consent to their destruction or degradation only where there is no question that the public interest demands it.

4. The Service discourages the occupation and destruction of biologically productive wetlands and shallows. The Service usually recommends that the site occupied by a project involve the least loss of area on the least valuable of the alternative sites; that avoidable loss or damage to such productive wetlands and shallows, their fish and wildlife, and their human uses be prevented; and that any damages or loss of such resources, proved unavoidable, be fully compensated.

5. The Service usually recommends against the issuance of U. S. Army Corps of Engineers permits for nonwater-dependent projects particularly where biologically productive wetlands are involved and alternative upland sites are available. Nonwater-dependent projects include homes, restaurants, parking lots, and other activities not functionally dependent on a waterfront location. A water-dependent project requires a location in or next to a water body to function, for example marinas, port facilities and docks.

Impacts - Vegetation and Wildlife

The development portions of proposed project (Alternative A) and Alternatives B through E would eliminate significant seasonal (and some perennial) wetland habitat. The developer has proposed two possible mitigation plans which are intended to compensate for the loss. In this report, the two plans were considered part of Alternatives A, B and D as on-site mitigation. Alternatives C and E suggest that an off-site mitigation area be identified to compensate for loss of habitat. However, no specific sites have been identified, and no evaluation of the suitability or feasibility of an off-site mitigation area has been completed for Alternatives C and E.

Exhibit L-3 provides a brief summary comparison of the two proposed mitigation plans. (Complete descriptions with the associated HEP analyses are included in Appendix V.) The primary difference between the two plans is that A1 proposes retention of most of the area as diked open space (ruderal fields) with construction of a fresh water pond and riparian vegetation, and A2 proposes salt marsh restoration of the majority of the site by breaching the dike and restoring tidal action.

The HEP analysis is based on the assumption that increasing the habitat value of the mitigation area can result in full compensation for the loss of habitat on the developed site. Using this assumption which involves defining existing habitat acreage and assigning unit values to representative species within these habitat areas, either of the two mitigation plans proposed by the developer would provide adequate compensation for the adverse impact of eliminating the habitat.

However, the DFG has stated that the proposed mitigation plans are insufficient in compensating for habitat losses because the HEP is an inappropriate measure of the habitat value, and because DFG assumptions regarding adequacy of compensation differ from those presented in the HEP. The DFG assumes that all acreage within the diked historic baylands has high potential for wetlands restoration and full compensation should be provided for

Exhibit L-3

Comparison of Proposed On-Site Mitigation Plans for Alternatives A, B, D

Mitigation	Plan A1	Plan A2
• Construct 50-year dredge materials site for ultimate conversion to salt marsh	154 acres	154 acres
• Retain seasonally flooded field	32 acres	0 acres
• Excavate freshwater ponds and plant riparian vegetation	50 acres	0 acres
• Breach dike and restore tidal action with ultimate restoration of salt marsh	0 acres	671 acres (862 for Alternative D)
• Establish permanent dredge materials site and preserve remaining area as unimproved open space (ruderal)	639 acres (820 for Alternative D)	50 acres
Total Mitigation Area:		
Alternatives A, B	875 acres	875 acres
Alternative D (Reduced Project)	1066 acres	1066 acres

loss of that potential on an acre-for-acre replacement basis. The developed areas of Alternatives A through E would remove the following acreages from potential restoration to salt marsh:

Alternatives A, B, C:	735 acres
Alternatives D, E:	544 acres

Restoration proposed in either mitigation plan (including the dredged materials site of 154 acres) could provide partial compensation for the loss of this acreage. However, a mitigation package which would provide full compensation would probably require off-site mitigation given the DFG assumptions.

The FWS generally recommends against construction of nonwater-dependent projects in wetlands or in diked former tidelands unless there is full compensation for wildlife and wetland losses. The FWS had stated a preference for on-site mitigation and restoration of tidal action to the entire mitigation area (mitigation plan A-2). This type of compensation would be compatible with the adjacent lands presently within FWS jurisdiction at Hamilton AFB (actually the legal title to those lands is under pending litigation with the California State Lands Commission, Bay Conservation and Development Commission and others.) However, recently, the FWS has expressed its concern about the implications of on-site mitigation on the potential of future agricultural use of the land.

A primary adverse impact of both mitigation plans (Alternatives A, B, D) is the conversion of agricultural land to non-agricultural uses. DFG policy encourages existing agricultural uses within the historical marsh margin and advocates restoration or upgrading of these lands for fish and wildlife use upon cessation of agricultural use. Continued agricultural use is considered feasible and may be considered vital to Marin and Sonoma dairy industries. See Section K, Soils and Agriculture. Therefore, although the two mitigation plans may compensate for some eliminated habitat, they would result in a significant loss of agricultural land. See Section K, Exhibit K-2 for acreage comparison of open space/salt marsh restoration and agricultural losses for each alternative.

The conversion of large amounts of agricultural land in Alternatives A, B and D would also conflict with the policy of the Marin County Bay Conservation Zone which advocates protection of diked agricultural land. In addition, these alternatives may be inconsistent with the policy which advocates retention and formation of large tracts of land within historic marshland areas as possible landbanks for the potential restoration of wetland habitats. Alternatives C and E would permit retention of the largest amount of acreage in agricultural production. Except for the no-project alternative (Alternative F), the off-site mitigations associated with Alternatives C and E would provide the largest amount of agricultural land and the largest landbank for the protection of potential wetland habitat restoration. Therefore, Alternative C or E with off-site mitigation for loss of wetland habitat would be the environmentally preferred development alternative since agricultural use could be continued and wetland compensation could be achieved if a suitable site could be identified and restored.

Alternatives A through E would have adverse impacts upon Novato Creek and would be inconsistent with the County Stream Conservation Area policy which prohibits residential development within 100 feet of the stream bank. The proposed master plan indicates about 50 single family dwellings would be placed on Novato Creek. This is a significant adverse impact because of the resulting loss of streamside vegetation, habitat and wildlife disturbances. (See also Section D, Land Use for additional policy discussion.)

On the western boundary of the property, a four-lane divided road is proposed for Alternatives A through E which would provide vehicular access to major portions of the development. The adjacent wildlife habitat (known as Ignacio Wetlands) of about 100 acres would be adversely affected by the close proximity of the road because of its present status as a wildlife and wetland preserve in the process of restoration. In order for the proposed road and the existing preserve to be compatible, a buffer zone of dense vegetation would have to be provided in a strip along the property line.

The proposed lagoons in Bel Marin Keys 5 would be highly susceptible to reduced water quality which would have a detrimental effect on aquatic life forms. The most significant impacts would be the short-term impacts during construction dredging and the longer impacts of insufficient circulation especially during the summer. Fertilizers and other surburban contaminants would invariably enter the lagoon. These pollutants in combination with raised water temperatures, minimal circulation and tidal exchange could have severe impacts on fish and other aquatic organisms and vegetation in the lagoon. See Section I on Water Quality for further discussion of water quality impacts and recommended mitigations. Most of the impacts on aquatic organisms can be mitigated with proper treatment for water quality. There is a high potential for adverse impacts, but with good maintenance practices these impacts are not considered significant.

The lagoon areas would probably not provide extensive wildlife habitat. The steep side slopes, deep floor (25 feet) and lack of marsh vegetation make the lagoon areas unsuitable for waterfowl nesting and highly limited for feeding. Some diving ducks and grebes (primarily bottom feeders) would use the lagoons for feeding, but the overall value of the lagoons as wildlife habitat would not be significant.

Mitigation Alternatives - Vegetation and Wildlife (Joint County Developer Responsibility)

- For Alternatives A, B, D, the proposed mitigation plans should be revised to reflect the concerns of DFG, USFWS, and Marin County. The adequacy of compensation for eliminated habitat should be determined by reaching a consensus with these agencies using the same basic assumptions.

- For Alternatives C and E, the off-site mitigation area should be selected in conjunction with Marin County, the California Department of Fish and Game and the U.S. Fish and Wildlife Service. Adequate compensation for loss of habitat should be agreed upon jointly by

these agencies. The size of an off-site mitigation area would depend upon the degree of restoration required, the management scheme proposed and the possibility of including some on-site mitigation as partial compensation.

- For either of the two proposed mitigation plans (Alternatives A, B, D) a revegetation plan should be completed for ultimate restoration of the dredge materials site to tidal salt marsh. The Corps of Engineers studies[9] on stabilization of dredge materials and the local San Francisco Bay experience with revegetation on dredge materials in Muzzi Marsh, Marin County, and Pond 3 along Alameda Creek Flood Control Channel should be used in evaluating the most efficient methods for creating valuable wildlife habitat.

- For Alternatives A through E the developer should relocate the proposed four-lane roadway farther to the east in order to permit a buffer zone and visual screen of vegetation for the wildlife preserve along the western property line.

- For Alternatives A through E, the 50 single family units proposed along Novato Creek should be either relocated or set back out of the Stream Conservation Area to conform with the policies of the Stream and Creekside Conservation zone.

Footnotes

[1]Madrone Associates, "Bel Marin Keys Wildlife Census, Status Report, September 9, 1980."

[2]San Francisco Bay Conservation and Development Commission, 1982. "Ecological Values of Diked Historic Baylands."

[3]The National Geodetic Vertical Datum 1929 (NGVD), formerly known as the Sea Level Datum of 1929, is a reference adopted as a standard geodetic datum for heights. The geodetic datum is fixed and does not take into account the changing standard of sea level.

[4]Letter from Nona B. Dennis, Vice-President, Madrone Associates, January 25, 1982.

[5]Madrone Associates, "Habitat Analysis and Mitigation Plan for the Proposed Bel Marin Keys Residental Development," April 27, 1981.

[6]Johnson, Huey D, Secretary for Resources, September 19, 1977. "Basic Wetlands Protection Policy."

[7]U.S. Fish and Wildlife Service and the California Department of Fish and Game, August 15, 1979. "Protection and Restoration of San Francisco Bay Fish and Wildlife Habitat," Vol. 1."

[8]U.S. Fish and Wildlife Coordination Act
Fish and Wildlife Act of 1956
Migratory Bird Treaty Act
Executive Order 11990-Protection of Wetlands
Executive Order 11988-Floodplain Management

[9]Massachusetts Institute of Technology. Prediction of Stable Elevation for a Marsh Created from Dredged Material. Prepared for U.S. Army Corps of Engineers Waterways Experiment Station. Vicksburg, Miss. 1975.

M. ARCHAEOLOGY

Setting

An archaeological records search was conducted for the site in the month of December 1981 by the Northwest Information Center, California Archaeological Site Inventory of Sonoma State University. The records search consisted of a review of pertinent literature on file at the Northwest Information Center (see References 1-14).

There were no previously recorded archaeological sites, National Register sites, or California Historical Landmarks situated within or immediately adjacent to the project boundaries. Previously recorded archaeological sites in the general vicinity were usually situated on hills or knolls at elevations above the shoreline of the former tidal marsh in close proximity to fresh water sources. According to historic maps, the project area was entirely within the salt marsh and was probably subject to continuous inundation.[1,2] Archaeological surveys previously conducted within environmental settings similar to that of the project area did not result in the discovery of any archaeological resources.

Impacts

In consideration of the literature search, the project area was considered to be of low archaeological sensitivity and further archaeological study is not recommended at this time. However, there remains the possibility of subsurface archaeological materials. Prehistoric materials include, but are not limited to, obsidian or chert flakes and artifacts, mortars and pestles, bones, human burials, and concentrations of shell. Historic materials include, but are not limited to, stone foundations and walls, structural remains with square nails, ceramics, sun tinted glass, and refuse deposits.

Mitigation (Developer Responsibility)

In the event that such materials are found during construction, work in the immediate vicinity of the find should be temporarily halted and a qualified archaeologist should be consulted to evaluate the situation in order to provide recommendations for the protection of significant archaeological resources.

Footnotes

[1]General Land Office, Plat Map T3N/R6W MDB & M, Sacramento: Bureau of Land Management, 1866, 1870, 1917.

[2]Nichols, Donald R. and Nancy A. Wright, compilers, Preliminary Map of the Historic Margins of the Marshlands, San Francisco Bay, California. U. S. Department of the Interior Geological Survey and Department of Housing and Urban Development, 1971.

[3]Archaeological Consulting and Research Services, Inc., Archaeological and Historical Resources of Hamilton Air Force Base, Novato. Report on file at the Northwest Information Center, Sonoma State University. File #S-1549. 1976.

[4]Barrett, S.A., The Ethnography of the Pomo and Neighboring Indians. University of California Publications in American Archaeology and Ethnology 6(1):1-332. 1908.

[5]Flynn, Katherine, Archaeological Impact Evaluation of two non-contiguous parcels of land near Ignacio, Marin County: (A) Bel Marin Keys Unit IV and (b) Ignacio Industrial Park Unit III (ARS 78-27). Report on file at the Northwest Information Center, Sonoma State University. File #S-891. 1978.

[6]Holman and Associates, Pipeline and Water Treatment Plant Facilities, Marin County. Report on file at the Northwest Information Center, Sonoma State University, File #S-1165. 1978.

[7]Kelly, Isabel, Coast Miwok. In Handbook of the North American Indians, Volume 8, California. Robert F. Heizer, ed., Washington D.C.: Smithsonian Institution. pp. 414-425. 1978.

[8]Kroeber, A.L., Handbook of the Indians of California. Bureau of American Ethnology Bulletin 78. Washington: Smithsonian Institution. 1925.

[9]Nelson, Nels C., Shellmounds of the San Francisco Bay Region. University of California. Publications in American Archaeology and Ethnology 7(4):309-356.

[10]State of California, California Inventory of Historical Resources. Sacramento: Department of Parks and Recreation. 1976.

[11]California Historical Landmarks. Sacramento: Department of Parks and Recreation. 1979.

[12]U. S. Office of the Federal Register, Federal Register, Notices, National Register of Historic Places, Annual and Cumulative Listing. Washington, D.C.: U.S. Government Printing Office, 44(25):7428-7436.

[13]Federal Register, Notices, National Register of Historic Places, Annual Listing. Washington, D.C.: U.S. Government Printing Office, 45(4):17448-17449.

[14]Federal Register, Notices, National Register of Historic Places, Annual Listing, Washington, D.C.: U.S. Government Printing Office, 46(22):10624-10625.

In addition to the references above, archaeological maps and site records on file at the Northwest Information Center of the California Archaeological Inventory, Sonoma State University, were reviewed.

N. AESTHETICS

Setting

The project site is situated in a flat low-lying area along the shores of San Pablo Bay. This terrain slopes very gently toward the Bay and portions of it have been developed with one- and two-story office/industrial buildings, existing Bel Marin Keys residential units and the Hamilton Air Force Base. More distant surrounding terrain rises dramatically to the north and west, forming the Marin hills. Hillsides are predominantly grass covered and dotted with sporadic oak groves. Novato Creek meanders along the northern edge of the project site, contributing to the property's water orientation.

Internal views at the site encompass large expanses of grass-covered fields which are interrupted by several levees, a pond, a drainage channel and an overhead transmission line which extends from the ends of Bel Marin Keys Boulevard. The presence of numerous wild flowers, shore birds and other fowl and lack of any existing development on the property tend to create a general atmosphere of rural tranquility.

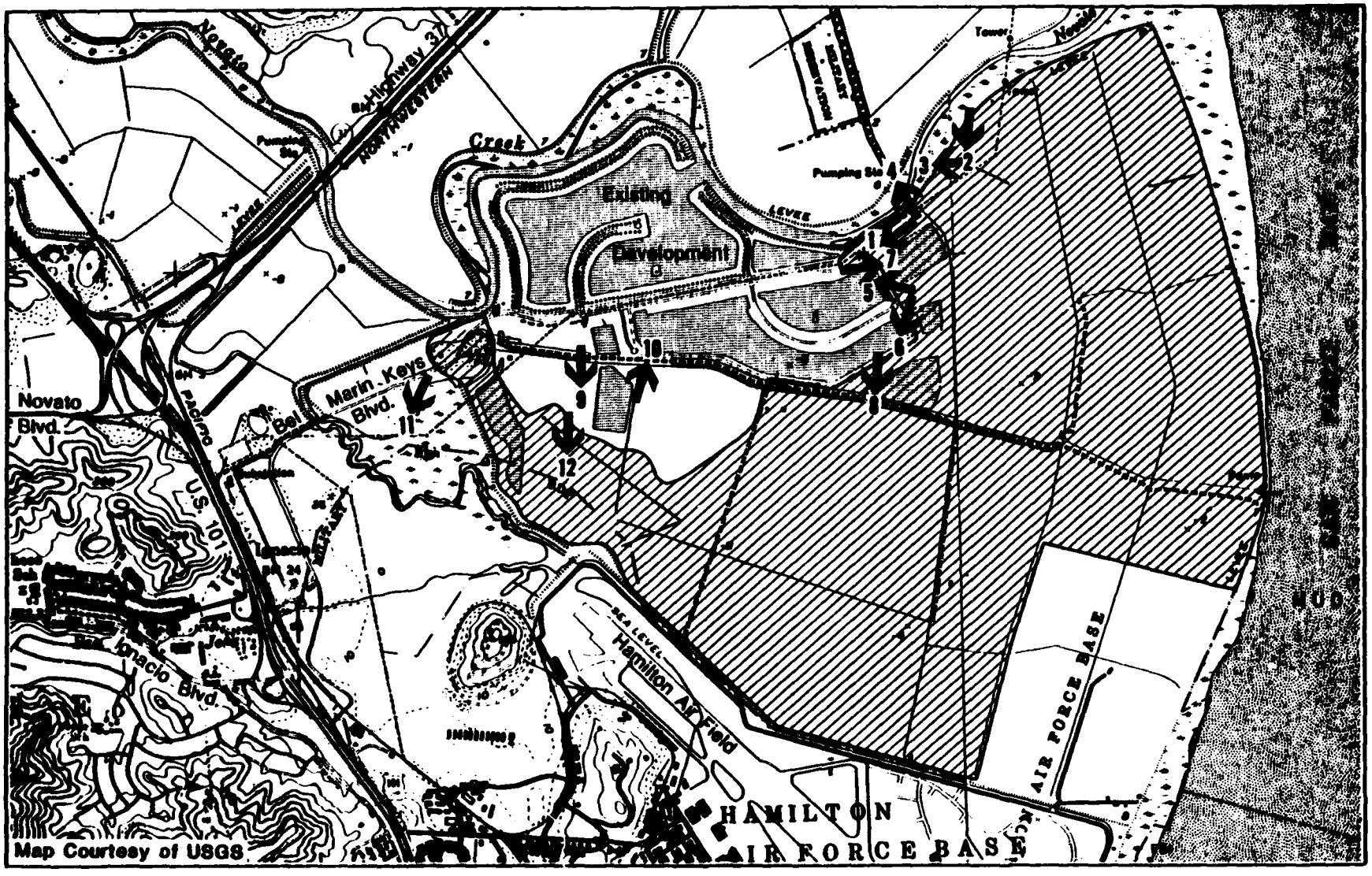
Views to the north and west of the site encompass the hills. Residential units, lagoons with small decks and some boats occupy westward foreground views. To the north, Novato Creek is a prominant visual feature in the foreground; vacant fields occupied by a small military building and some vertical antennae lie beyond with the hills in the distance. Hamilton Air Force Base structures provide a conspicuous edge along the site's southern boundary. Because the site is relatively flat, the Bay is barely visible unless one stands on the levees or approaches the eastern edge of the site.

The site is most visible from the adjacent residential neighborhood and from the Air Force Base. Views from the Air Force Base are not considered to be significant in terms of aesthetics. Motorists on Highway 101 can not view the project site clearly due to the existing terrain and the urban development which separate the highway from the site. Portions of the property can be seen from Highway 31 although views are largely obscured by land form, existing development or vegetation.

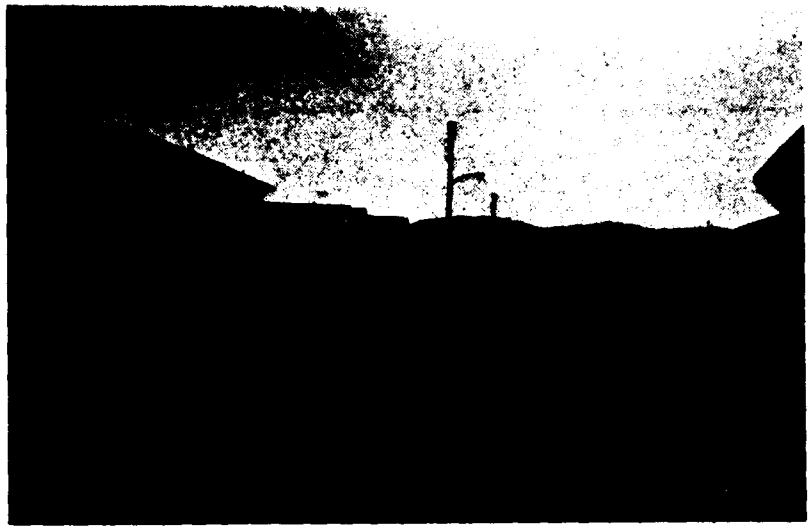
Impacts - Views

The aesthetic impacts for Alternatives A-E are considered to be essentially the same with only minor variation. Alternative E which reduces the total acreage of the development would have slightly less visual impact and the no project alternative (Alternative F) would not result in any visual impacts.

The visual appearance of the site would be dramatically transformed after project construction; grass covered fields would be replaced by lagoons, roads, a marina, and residential and commercial structures with associated landscape. Structures would be a mixture of one and two-stories and would be of a scale similar to the nearby existing developments.



TORREY & TORREY INC. 2T environmental/urban planning and design	Location of Views	EXHIBIT N1



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TORREY & TORREY INC. environmental/urban planning and design	Views	EXHIBIT N2

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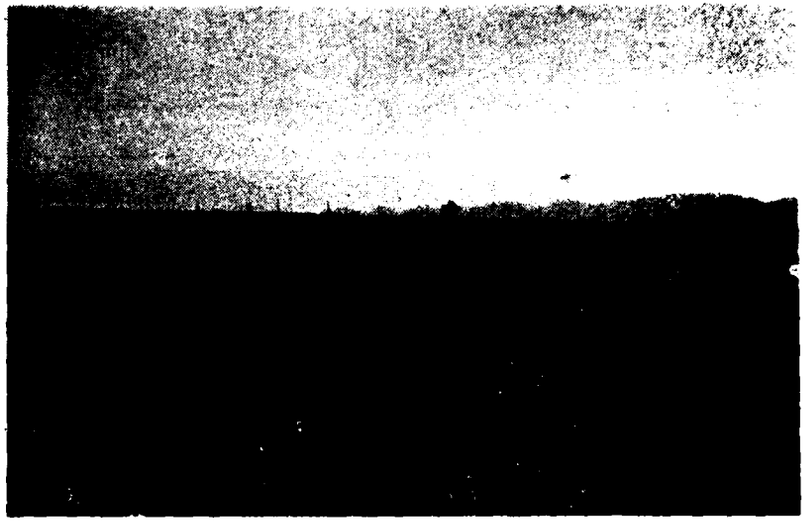

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TORREY & TORREY INC. environmental/urban planning and design	Views	EXHIBIT N3

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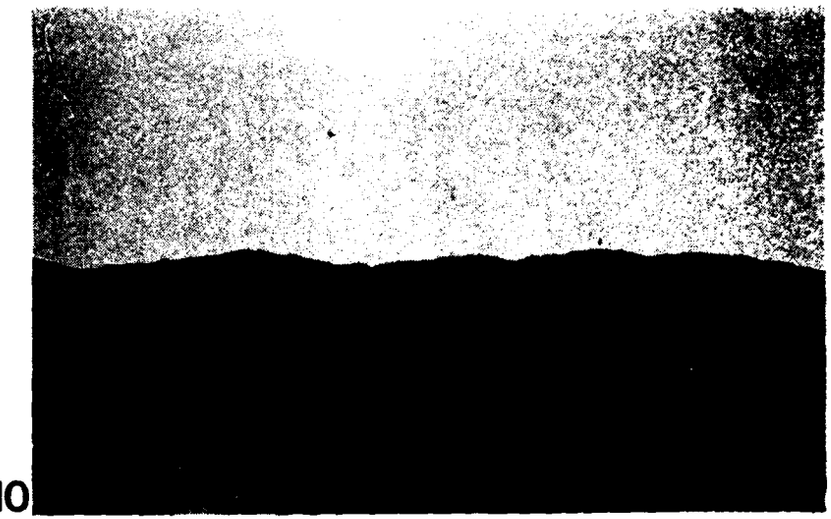

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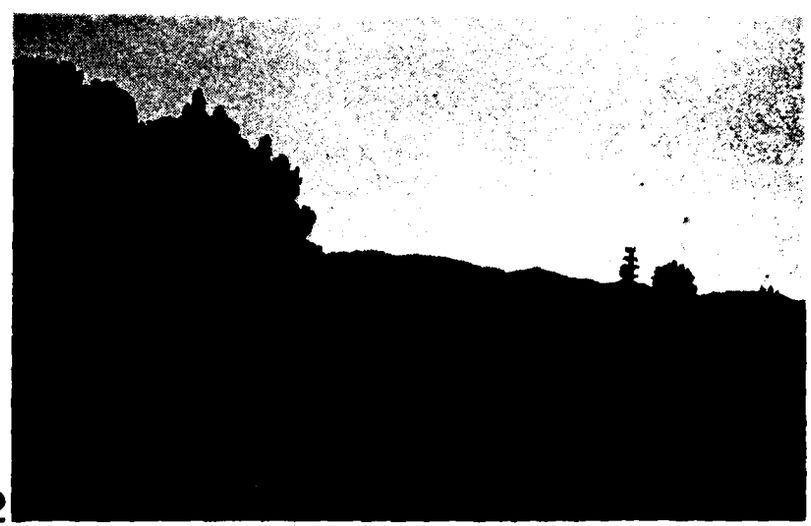

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The two large parking areas which are proposed at the property's northwest corner could be visually obtrusive for pedestrians as well as from some existing Bermuda Harbor residences. These parking lots might also be visible from Bel Marin Keys Boulevard.

Parking of boats and recreational vehicles by future residents would create aesthetic intrusion into the proposed community's front yards and public streets.

Most of the project would be constructed immediately south of the existing Bel Marin Keys units. This would create the appearance of enlarging the existing development and would minimize aesthetic intrusion into some open areas of the site.

Views from Hamilton Air Force Base and from some of the existing Bel Marin Keys residences would be most affected by construction of the project. The view from Hamilton would be altered but not adversely. Views from residences facing south and located on Bermuda Harbor, Del Oro Lagoon and Bahama Reef would be impacted. Lagoon water would remain in foreground views but agricultural fields and the distant Air Force base would no longer be visible. Instead, views would include single or multi-family units across lagoon waters.

Construction of the commercial marina, multi-family, and single family residences at the nothern edge of the property would have minimal visual impact on views from existing residences or from the environs. It would be visible from north facing residences on Bel Marin Keys Boulevard and Bahama Reef. The creek bank would be visually accessible along most of the property with the exception of the segment where single family lots are proposed.

The main aesthetic impact of the proposed project would be the further intrusion of development into the County's remaining open agricultural/shoreline acreage. This is considered to be significant as a cumulative impact.

Mitigation Measures - Views

(Developer Responsibility)

- Visual access to the creek should be increased either by construction of a viewing platform along the creek's bank or by eliminating (or relocating) the single family units which are proposed along the creek.

- A shoreline trail and/or viewing platform should be constructed in order to increase visual access to the bay. Please see recommended mitigation measure for public access in Section D, Bay Conservation and Development Commission.

- The extension of Bel Marin Keys Boulevard should be gently curved to reinforce the Creek's alignment and to provide the 100 foot setback from the creek bank.

- Enclosed, secure parking areas should be provided for boats and recreational vehicles. Three of these parking areas should be provided within the proposed development; one to be located at the multi-family neighborhood (area #1 on the master plan), one at the marina (area #2 on the master plan), and a third along the southern single family loop. All boat and recreational vehicle parking should be screened from views within the proposed development. Parking areas should be well screened with mature plant material and large paved areas should be broken up with landscape beds and canopy trees.

- Native plant materials should be incorporated into planting plan.

- Mature street trees should be planted on all proposed roadways in order to enhance the streetscapoe by providing shade and pedestrian scale. Trees should be placed so as to allow views out to the lagoons.

(Homeowners Responsibility)

- The Homeowners Association should adopt a policy that prohibits parking of boats and recreational vehicles along public streets.

Impacts - On-site Functional Relationships

The master plan generally reflects good site planning principles. Single family units would be located so as to take advantage of maximum water access and views. Multi-family units and commercial structures would be located with the community center near the project entrance. This would provide convenient access and amenities for residents of medium density units while minimizing traffic impacts on lower density residences.

The neighborhood park location would be problematic for two reasons. The park would be completely surrounded by roadway. While surrounding public open space by roadway might be advantageous from a security standpoint, it presents pedestrian safety problems for park users, particularly for small children. Another weakness in the neighborhood park location would be its close proximity to single family residences and its distance from medium density units. From a recreation planning standpoint, it would be more desirable to locate the neighborhood park closer to multi-family units which do not have private front and rear yards.

Mitigation Measure (Developer Responsibility)

- The neighborhood park should be located adjacent to the major multi-family residential cluster (area #1 on master plan). The park could be situated between the single and multi-family neighborhoods. Moving the park location would require removing some units; however, some multi-family units could be added on the acreage originally designated for a neighborhood park site.

O. ENERGY

Setting

The Energy Element of Marin County's General Plan, adopted in 1980, outlines the goals and rationale for the County's energy conservation program. It also identifies policies and implementation measures to guide energy use.

Marin County's energy goals state: "Achieve a sustainable energy future for the County by reducing total energy demand and by replacing total dependence on nonrenewable, imported energy resources with reliance on local renewable energy resources." Residential and transportation are the sectors identified for aggressive conservation measures which will result in reducing the County's energy demand.

Regarding design, construction and operation of structures, the policies state that the energy efficiency of new structures should be increased and that renewable energy sources, including solar energy, should be used in all structures to a feasible extent. Transportation policies call for encouraging the use of energy-efficient transportation such as: public transit, car pools, vanpools, bicycling, and walking. It should be noted that according to the Energy Element, passenger transportation currently consumes 41 percent of the energy used directly within Marin County.

The project site is level and without tree cover. Thus it is not shaded by either vegetation or topography and provides opportunities for solar energy use. Public transit is not readily available to the site; the closest bus stop is about two miles away at Nave Drive.

Impacts

Impacts would be essentially the same for Alternatives A through E; there would not be any impacts associated with the no project alternative (F).

The proposed develpment would establish an energy demand for residential and office/commercial uses. Residences would require energy for heating, cooling, lighting and appliances. Energy for heating swimming pools and hot tubs would also be required.

Office space and commercial space would require energy for space heating and cooling, hot water, lighting, office machinery and equipment. The most significant portion of energy use (50%) in office buildings is electricity for lighting.

Transportation to and from the site would be heavily auto dependent, due to the location of the nearest bus stop. Convenient food shopping would be located within easy walking distance of the proposed residences. Distance and terrain would be suitable for bicycling to and from the elementary, junior high and high schools as well as other destinations.

Mitigation Measures

These measures are recommended in addition to Title 24 (California Administrative Code) requirements for new construction.

(Developer Responsibility)

- Building design and orientation of proposed structures should maximize solar access and allow for installation of solar panels.

(Develper Responsibility)

- Daylighting opportunities for office space should be maximized by placing windows near high use areas, using light interior colors for high reflectance and incorporation of glass for interior walls to allow deeper penetration of natural light.

(Developer Responsibility)

- A bicycle lane should be provided along Bel Marin Keys Boulevard.

(Developer Responsibility)

- Bicycle parking facilities should be provided at all proposed commercial and recreational facilities on the site.

(Homeowners Association Responsibility)

- Carpooling and vanpooling should be organized and encouraged by future residents.

(Developer/Homeowners Responsibility)

- The primary heat source for swimming pools and hot tubs should be solar energy rather than natural gas or electricity.
- Trees should be planted to shade large areas of pavement in parking areas. Selection of plant material should be compatible with recommendations of the homeowner's association architectural standards.

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R. PUBLIC INVOLVEMENT

Public involvement in the review of the Bel Marin Keys Unit 5 project has been (or will be) solicited by the Corps of Engineers and Marin County through the actions described below. In combination, they provide notices to agencies, organizations, and concerned individuals to participate in the review process through national, state and local means of notification.

17 August 1981	Notice of Preparation of a Draft EIR was issued by Marin County inviting participation in the scoping process
30 November 1981	Notice of Intent to prepare a Draft EIS on the Home Savings and Loan permit application to develop Bel Marin Keys Unit 5 was published in the Federal Register by the Corps to invite participation in the scoping process.
9 December 1981	Joint Corps of Engineers/Marin County public scoping meeting was held in Novato.
14 December 1981	Public Notice No. 14336N33 issued by the Corps for Home Savings and Loan permit application.
10 March 1982	The Corps of Engineers and Marin County attended a public meeting at the Bel Marin Keys Community Services District (BMK-CSD) regard the BMK-CSD concerns about the proposed Unit 5 project and its relationship to the existing development in BMK.
September 1982	The Draft EIR/EIS will be circulated.
	A Notice of Availability of the Draft EIR/EIS will be published in the Federal Register by the Environmental Protection Agency
	Marin County will issue a Notice of completion which will be acknowledged in the California EIR Monitor.
	Marin County will schedule a public hearing(s) on the EIR/EIS. The hearing will be noticed in local newspapers.

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