

FINAL EIS

Office Of Environmental Quality Control  
Office Of The Governor  
550 Halekauwila Street  
Tani Office Building, Third Floor  
Honolulu, Hawaii 96813

Office Of Environmental Quality Control  
Office Of The Governor  
550 Halekauwila Street  
Tani Office Building, Third Floor  
Honolulu, Hawaii 96813

# An Analysis of the Economic, Social and Environmental Impacts of Kiahuna Golf Village

Prepared for the County of Kauai  
and The State of Hawaii

**Prepared by:**

Belt, Collins, Ltd.  
745 Fort Street, Suite 514  
Honolulu, Hawaii 96813

and

McDonald & Smart, Inc.  
303 Sacramento Street  
San Francisco, California 94111

**In association with:**

Daly & Associates  
950 Pacific Trade Center  
Honolulu, Hawaii 96813

Office of Environmental Quality Control  
Office of the Governor  
550 Halekauwila Street  
Tani Office Building, Third Floor  
Honolulu, Hawaii 96813

NOTICE

ALL reference material borrowed from this library will be on a 30-day loan period, limited to ONE RENEWAL ONLY.

If borrowed material is not returned when DUE, is DAMAGED, or LOST, there will be a REPRODUCTION CHARGE OF 25¢ PER PAGE.

OEQC LIBRARY - PHONE 548-6915  
550 HALEKAUWILA STREET ROOM 301

# MOANA

May 15, 1976

Office of Environmental Quality Control  
Office of the Governor  
550 Halekauwila Street  
Honolulu, Hawaii 96813

Gentlemen:

We are pleased to enclose copies of the Environmental Impact Statement (EIS) for Kiahuna Golf Village, the proposed Moana residential resort community at Poipu, Kauai. This EIS was prepared in two parts, corresponding to the coverage of different subject materials, by two different consulting firms. Part I deals with the socio-economic setting and projected impact, and was prepared by McDonald and Smart, Inc. of San Francisco, California in association with Daly & Associates of Honolulu, Hawaii. Part II deals with the physical setting and projected impacts, and was prepared by Belt, Collins & Associates, Ltd. of Honolulu, Hawaii.

The EIS was prepared in compliance with the Environmental Impact Statement Regulations set forth by the Environmental Quality Commission. All persons and groups who requested consultation were sent a copy of the EIS Preparation Notice. For their benefit, a public meeting was held on March 11, 1976 at the Koloa Civic Center in Koloa, Kauai. Interested persons were given thirty (30) days thereafter to respond in writing to the materials presented at the meeting. All written comments were responded to in writing. Appendix E to the EIS reports in detail on the public meeting and incorporates all comments received and the responses thereto.

If any questions arise or further information is required, please do not hesitate to contact me.

Sincerely,



Robert L. Harmon  
President Office of Environmental Quality Control  
Office of the Governor  
550 Halekauwila Street  
Tani Office Building, Third Floor  
Honolulu, Hawaii 96813

Enc.

TABLE OF CONTENTS

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION . . . . .	1
PROJECT DESCRIPTION . . . . .	3
Location . . . . .	3
Development Concept . . . . .	3
Development Phasing . . . . .	10
Infrastructure Requirements . . . . .	10
PART I - THE ECONOMIC AND SOCIAL IMPACT OF KIAHUNA GOLF VILLAGE	
I. SUMMARY OF ECONOMIC AND SOCIAL FINDINGS/ PROJECT JUSTIFICATION . . . . .	14
Background . . . . .	14
Permanent Housing Market . . . . .	16
Condominium Sales Market and Moana Project Absorption Rates . . . . .	17
Hotel-Condominium Visitor Market . . . . .	18
Project-Related Public Costs and Revenues . . . . .	19
Project-Generated Income and Employment . . . . .	20
Social Impact . . . . .	21
II. SOCIAL AND ECONOMIC SETTING . . . . .	32
General Description of the County . . . . .	32
Population Characteristics . . . . .	32
The Economy of Kauai . . . . .	36
III. MARKET ANALYSIS . . . . .	41
Kauai Housing Market Analysis . . . . .	41
The Hotel-Condominium Visitor Markets in Hawaii . . . . .	61
The Hawaii Condominium Market . . . . .	71

	<u>PAGE</u>
IV. PROJECT RELATED PUBLIC COSTS AND REVENUES . . . .	77
Public Revenues . . . . .	77
Public/Private Service Expenditures . . . . .	98
Revenue-Expenditure Summary . . . . .	128
Summary of the Analysis . . . . .	133
Comments . . . . .	134
V. PROJECT GENERATED PRIVATE SECTOR INCOME AND EMPLOYMENT . . . . .	139
Kauai County Population, Income, and Employment . . . . .	140
Kauai County Input-Output Model . . . . .	148
Moana Project Income and Employment Impacts . . . . .	158
Comments on the Analysis . . . . .	169

PART I - TABLES

INTRO.	1. Land Tenure and Zoning Information - Moana Project . . . . .	8
	2. Moana Project - Proposed Land Uses - 480-Acre Development . . . . .	9
	3. Moana Project Build-out Schedule . . . . .	11
II.	1. Population Characteristics in Percentages, Kauai . . . . .	34
	2. Population Growth as a Result of the Moana Project . . . . .	37
	3. Kauai Labor Force . . . . .	40
III.	1. Comparison of Housing and Construction Cost Indices . . . . .	42
	2. Construction Price Index by Major Components . . . . .	43
	3. Private Residential Construction and Demolition Authorized on Kauai . . . . .	44
	4. Housing Vacancies on Kauai . . . . .	45
	5. Dollar Volume of MLS Sales . . . . .	47
	6. Total Sales in Kauai County . . . . .	47
	7. Average Sales Price for MLS Single- Family Residential Sales . . . . .	48
	8. Land Sales on Kauai . . . . .	49
	9. Improved Lot Sales Data for Kauai . . . . .	50

	<u>PAGE</u>
10. Household Incomes and Home Buying Ability of Kauai Residents . . . . .	57
11. Moana Project Lots Sales Prices Relative to Kauai Residents' Ability to Pay . . . . .	60
12. Overnight Visitors to Hawaii by Months . . . . .	62
13. Visitors to the State of Hawaii and Visitor Expenditures . . . . .	63
14. Sources of Visitors . . . . .	64
15. Estimates of Visitor Days and Average Daily Visitor Census by Direction of Travel . . . . .	65
16. Age Distribution of Westbound Travelers to Hawaii in 1974 . . . . .	66
17. Hotel Occupancy Rates on Kauai . . . . .	68
18. Kauai Visitor Room Inventory . . . . .	69
19. Estimates of the Impact of Moana Project Visitor Population . . . . .	70
20. Unit Size for Kauai Condominiums . . . . .	72
21. Sales Data Per Square Foot for Selected Kauai Condominiums . . . . .	73
22. Real Estate Sales Data for Kauai . . . . .	76
IV. 1. County of Kauai Estimated Revenue . . . . .	79
2. Change in County Revenue . . . . .	80
3. County of Kauai Six-Year Statement of Estimated Revenue by Source and Fund for Fiscal Years 1975-76 Through 1980-81 . . . . .	81
4. Weli Weli House Lots Subdivision . . . . .	82
5. Estimated Assessed Valuation Per Unit for the Moana Project . . . . .	84
6. Estimated Assessed Value of Property and Dwellings for the Moana Project . . . . .	85
7. County of Kauai Tax Rate . . . . .	87
8. Property Tax Revenue from the Knudsen Trust . . . . .	88
9. Estimated Property Tax Revenue from the Moana Project . . . . .	90
10. Building Permit Fee Schedule . . . . .	93
11. Estimated Personal Income Tax Revenues Resulting from Moana Project . . . . .	94
12. Estimated County of Kauai Public Revenues from Moana Project . . . . .	96
13. Estimated State of Hawaii Public Revenues from Moana Project . . . . .	99

	<u>PAGE</u>
14. County of Kauai Estimated Expenditures . . .	100
15. Changes in County Expenditures . . . . .	103
16. County of Kauai Six-Year Statement of Estimated Expenditures . . . . .	104
17. Annual Cost of Increased Police Protection . . . . .	105
18. Kauai Police Department . . . . .	107
19. Kauai Police Activity . . . . .	108
20. Estimated Annual Cost of Increased Fire Protection with Moana Project . . . . .	110
21. Kauai Fire Department Activity . . . . .	111
22. Kauai Outdoor Recreation Plan . . . . .	114
23. Koloa-Poipu and Kalaheo-Kekaha Outdoor Recreation Plan . . . . .	115
24. Estimated School Enrollment as a Result of the Moana Project . . . . .	119
25. Per Pupil Cost Based on Average Enrollment by Cost Categories . . . . .	121
26. Koloa Elementary School Enrollment . . . . .	122
27. Estimated Per Pupil Expenses Effected by Moana Project . . . . .	123
28. Estimated Increase in Education Costs as a Result of the Moana Project . . . . .	124
29. Hospital Facilities by Hospital, Location, Occupancy, and Patient Days . . . . .	126
30. Estimated County of Kauai Public Expenditures as a Result of the Moana Project . . . . .	129
31. Estimated Other Public/Private Service Expenditures as a Result of the Moana Project . . . . .	130
32. No Project Alternative - Revenue and Expenditures . . . . .	131
33. Moana Project Alternative - Public Revenues and Expenditures . . . . .	132
34. County of Kauai Six-Year Financial Projection . . . . .	137
V. 1. Selected Population Characteristics . . . . .	141
2. Selected Population Characteristics, 1974 . . . . .	143
3. Kauai's Major Employer Categories . . . . .	145
4. Kauai County Employment . . . . .	146
5. Unemployment Insurance Claimants by Industry and Sex . . . . .	147
6. Transactions Table, Kauai . . . . .	150
7. Technical Coefficient Table . . . . .	151
8. Interdependence Table . . . . .	152

	<u>PAGE</u>
9. Output Multipliers . . . . .	156
10. Employment Multipliers . . . . .	157
11. Projected Employment as a Result of the Moana Project . . . . .	159
12. Employment and Income . . . . .	160
13. Construction Activity Impacts . . . . .	162
14. Tourist Activity Impacts . . . . .	163
15. Components of the Construction Activity Multiplier . . . . .	164
16. Components of the Tourist Activity Multiplier . . . . .	165
17. Projected Economic Activity as a Result of the Moana Project . . . . .	167
18. Total Change in Employment . . . . .	168

PART I - FIGURES

INTRO.	1. Project Site Location . . . . .	4
	2. Proposed Land Use . . . . .	5
II.	1. Census Tracts on Kauai . . . . .	35
IV.	1. Existing Public Facilities . . . . .	101
V.	1. Moana Project Economic Activity . . . . .	168

PART II - THE PHYSICAL IMPACT OF KIAHUNA GOLF VILLAGE

I.	SUMMARY OF PHYSICAL FINDINGS . . . . .	171
II.	PHYSICAL SETTING . . . . .	173
	The Physical Environment . . . . .	173
	Historic Setting . . . . .	197
	Infrastructure . . . . .	200
	Transportation . . . . .	201
III.	RELATIONSHIP OF PROPOSED ACTION TO LAND USE PLANS, POLICIES AND CONTROLS . . . . .	204
	Consistent with General Plan Goals and Objectives . . . . .	204
	Desirable Land Use Pattern . . . . .	209
	Relationship to County Development Plan . . . . .	209
	Contiguous to Existing Urban Area . . . . .	210

	<u>PAGE</u>
Provides/Maintains Shoreline Access . . . . .	210
Interaction with Adjacent Uses . . . . .	210
IV. ANTICIPATED IMPACTS OF PROPOSED ACTION . . . . .	212
Land Transformation and Construction . . . . .	212
Water Resources . . . . .	216
Biological Aspects . . . . .	225
Archeological Sites . . . . .	227
Visual Character . . . . .	228
Infrastructure . . . . .	232
Transportation - Traffic Impact . . . . .	240
V. ADVERSE ENVIRONMENTAL IMPACTS. . . . .	254
Airborne Emissions . . . . .	254
Noise Generation . . . . .	265
Water Pollution . . . . .	270
VI. ALTERNATIVES . . . . .	272
Alternative One: No Amendment to General Plan . . . . .	272
Alternative Two: Partial Amendment to General Plan . . . . .	279
Alternative Three: Incremental Amend- ment to General Plan . . . . .	283
VII. RELATIONSHIP BETWEEN SHORT TERM USES AND LONG TERM PRODUCTIVITY . . . . .	286
Agricultural Potential Versus Economic Return from a Residential Community . . . . .	286
Unaltered Open Space Versus Project Land Transformation . . . . .	287
Local Population Versus Introduced Population . . . . .	288
 PART II - TABLES	
1. Climatological Data for Koloa, Kauai, Hawaii. . . . .	178
2. Sample Water Quality Data from Wells Supplying Domestic Water for the Koloa-Poipu Area - U.S.G.S. . . . .	187
3. Coastal Water Quality Data - Nutrient Levels. . . . .	191

	<u>PAGE</u>
4. Coastal Water Quality Data - Coliforms. . .	192
IV. 5. Comparison of Percentage Groundcover . . .	212
6. Summary - Topsoil Requirements (Excluding Golf Course) . . . . .	214
7. Topsoil Requirements - Golf Course . . . . .	215
8. Expected Disposition of Total Water (Irrigation and Rainfall) Applied to Golf Course. . . . .	219
9. Expected Golf Course Fertilization . . . . .	220
10. Yearly Fertilizer Requirements - Sugarcane . . . . .	222
11. Expected Disposition of Total Water (Irrigation and Rainfall) Applied to Landscaped Areas . . . . .	224
12. Fertilization in Landscaped Areas Other than the Golf Course . . . . .	225
13. Two-Way Traffic Volumes for Poipu Road . . .	245
14. Population Per Dwelling Unit . . . . .	247
15. Proposed Moana Project's Vehicle Trips Generation for Full-Time Residents, Employees, and Part-Time Residents/ Visitors . . . . .	250
16. Proposed Moana Project's Vehicle Trips Generation for Part-Time Residents/ Visitors . . . . .	251
V. 17. Moana Project Material Requirements . . . . .	256
18. Generated Truck Trip Information. . . . .	257
19. Population Growth as a Result of the Moana Project . . . . .	258
20. Projected Employment as a Result of the Moana Project . . . . .	260
21. Automobile Trip and Mileage Generation . . .	261
22. Vehicle Emissions - Moana Project . . . . .	263
23. Traffic Noise Levels at Project Completion - Poipu Road . . . . .	267
 PART II - FIGURES	
II. 1. Soils: Koloa-Poipu Area . . . . .	176
2. Monthly Rainfall vs. Pan Evaporation . . . . .	180
3. Koloa-Poipu Drainage Area . . . . .	182
4. Tsunami Inundation Limits . . . . .	184
5. Well Sites: Koloa-Poipu Area . . . . .	186

	<u>PAGE</u>
6. Generalized Cross Section: Koloa- Poipu Area . . . . .	189
IV. 7. Proposed Infrastructure . . . . .	234
V. 8. Construction Equipment Noise Ranges . . . . .	266
9. Weighted Sound Levels and Human Response . . . . .	268
10. Nomograph for Approximate Prediction of Highway Noise Levels . . . . .	269

APPENDICES

A. UNFILLED JOB OPENINGS BY COUNTIES, JANUARY, 1975 . . . . .	292
B. LABOR MARKET CONDITION BY SELECTED OCCUPATIONS . . . . .	310
C. KIAHUNA TRAVEL QUESTIONNAIRE . . . . .	318
D. REFERENCES . . . . .	322
E. PUBLIC COMMENT . . . . .	328

INTRODUCTION

## INTRODUCTION

This Environmental Impact Statement (EIS) covers Moana Corporation's ("Moana") planned residential development known as Kiahuna Golf Village ("the Moana Project"), at Poipu, County of Kauai, State of Hawaii.

Moana recognizes that as a result of its planned development, certain environmental changes may be brought about that have varying degrees of both beneficial and adverse impacts on the physical, economic, and cultural aspects of the land, its regional setting, and population.

This EIS presents an evaluation and assessment of the physical, economic, aesthetic, social, and environmental impacts associated with the Kiahuna Golf Village project, and sets forth the ways in which Moana will attempt to maximize the beneficial effects of the project and to reduce or mitigate the adverse effects.

\* \* \*

Moana has been in the development and property management business for over fifteen years, and has earned the highest reputation for responsible planning and development. Moana began business in Hawaii in 1972 with the development of Kiahuna in the Poipu-Koloa area of Kauai.

The Kiahuna project is an example of Moana's approach to development. This project, which will be completed in the early part of 1976, consists of 200 low-rise beach houses designed in the Hawaiian "missionary" style.

Moana is also lessee of the Plantation Gardens property adjacent to Kiahuna, where a low-rise, low-density development is being planned which will preserve the public restaurant and historic gardens on the property.

The result of over two years of careful planning, Kiahuna Golf Village will be a quality low-density residential and resort development which, with nearly 70% of the land remaining as open space, will preserve the desirable rural character of the site. Further, as we will show in this Environmental Impact Statement, the proposed project will provide an environment economically, socially, and aesthetically beneficial to residents of the Poipu-Koloa area and the County of Kauai.

\* \* \*

This EIS is presented in two parts. Part I focuses on the overall description of the project and sets forth the social and economic aspects and impact analysis of the project. This analysis was developed by McDonald & Smart, Inc., planning and management consultants. The firm was assisted by Daly & Associates, which researched the sales potential and market impact of the proposed project.

Part II centers on an evaluation and impact analysis of the physical aspects of the environment. This analysis was prepared by Belt, Collins & Associates, Ltd., engineering, planning, and landscape architectural consultants.

\* \* \*

## PROJECT DESCRIPTION

### LOCATION

The proposed Moana Project is located in the Poipu-Koloa area of the Island of Kauai. The Regional Map (Figure 1) shows the 480-acre project's relationship to the major population centers and features on the island and within the area: Lihue and Lihue Airport are approximately 18 miles to the northwest; Koloa town is 2 miles to the north; and Port Allen and Waimea are 12 miles and 19 miles to the west, respectively. The site is bounded on the west and south by Poipu Road.

The Poipu area is one of Kauai's principal resort areas and presently includes five major hotels, including the 168-room Sheraton Kauai and the 141-room Poipu Beach Hotel. The area was designated as a resort region as part of the State's 1960 Visitor Destination Area Study, with the region encompassing Port Allen, Poipu, and the coastal stretch extending from Lawai Bay to Makaheuna Point. The area is also recognized by Kauai County as a principal resort destination area.

### DEVELOPMENT CONCEPT

Moana Corporation proposed to develop a low-density resort residential community on approximately 480 acres of land owned by the Knudsen Trusts in the Koloa-Poipu area. The development, which will be referred to as the Moana Project, will consist of approximately 1,450 dwelling units with an overall density of slightly less than three units per acre. The expected average population is projected at about 2,700 residents.

The development concept of the Moana Project is shown in Figure 2.

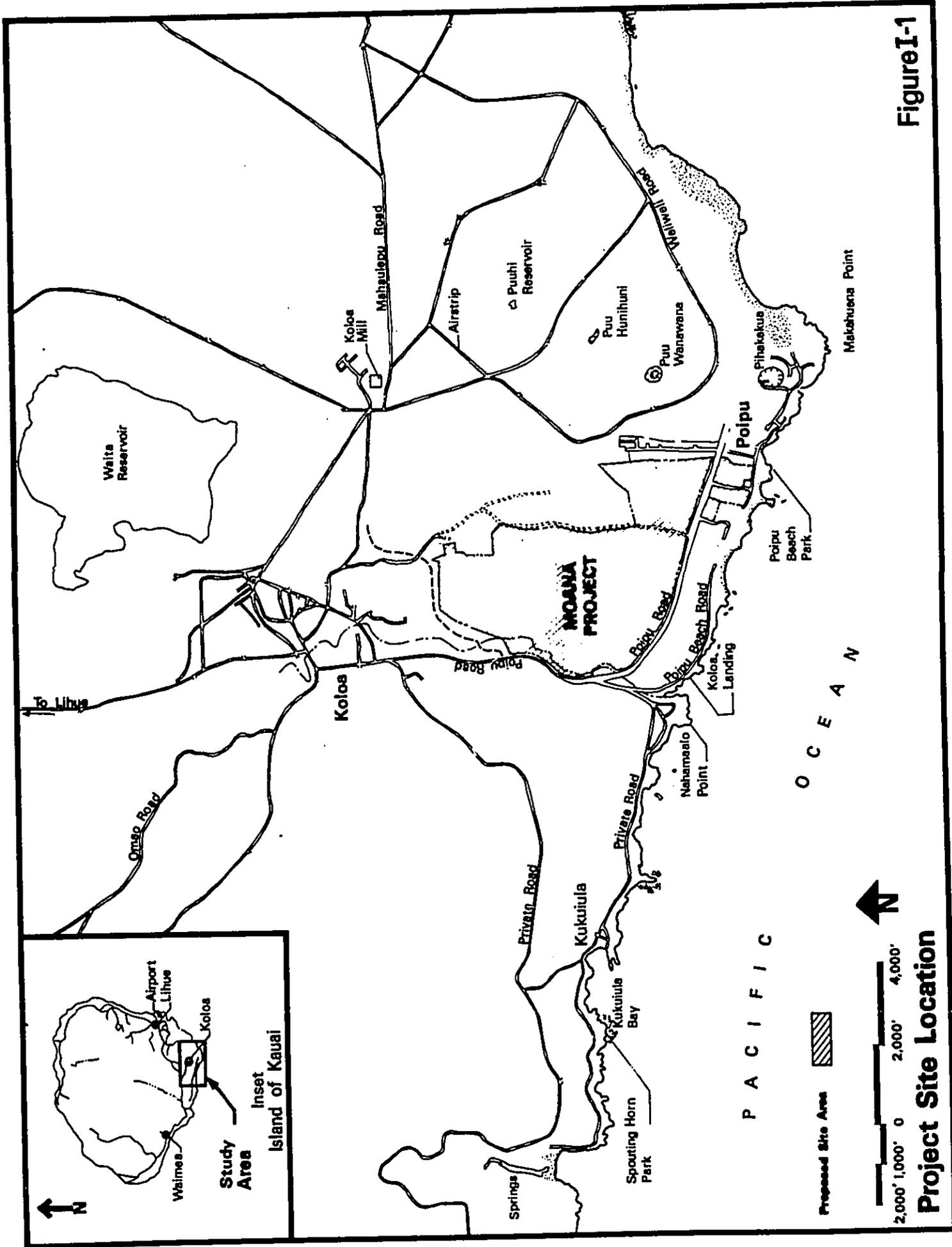


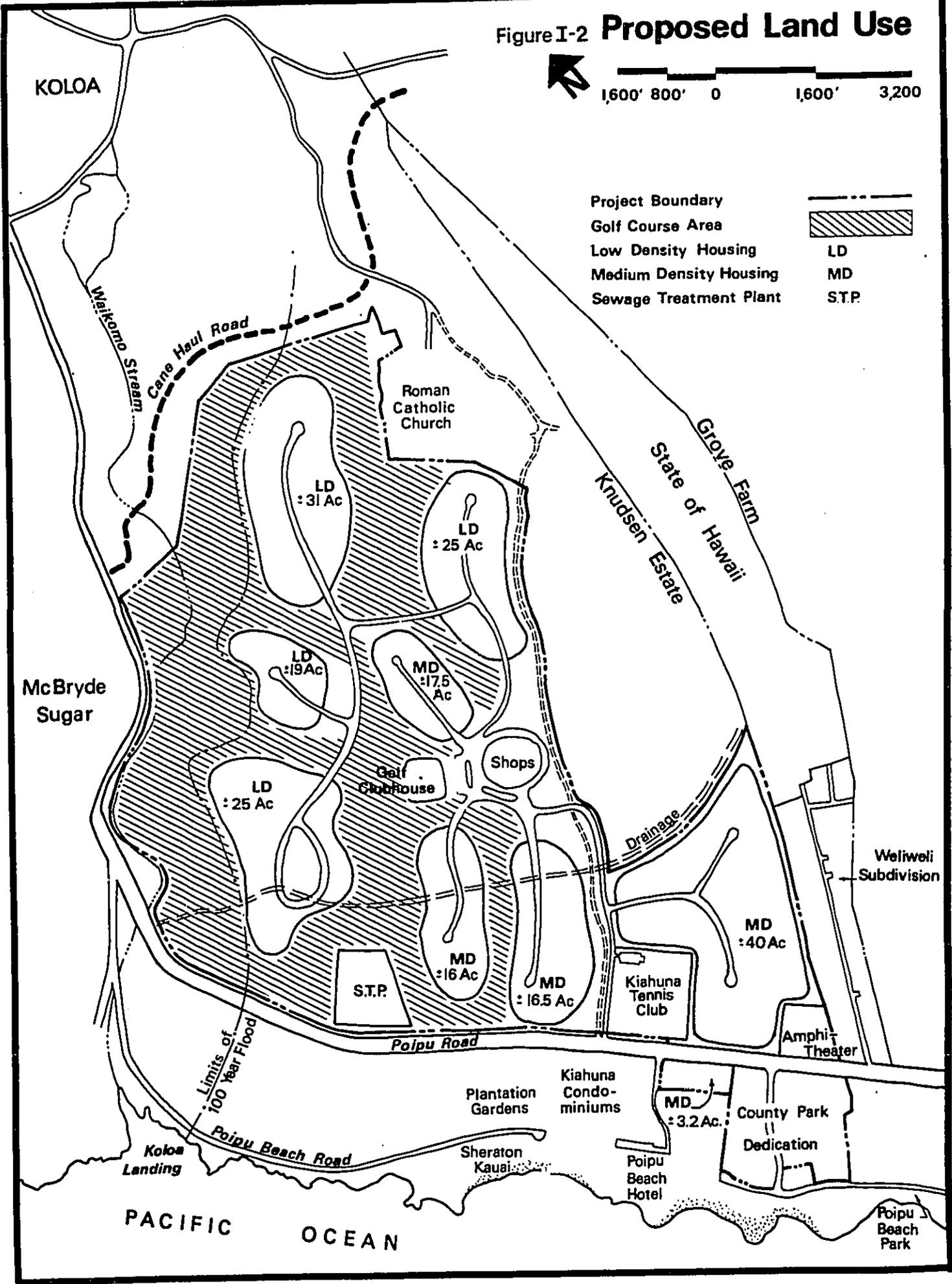
Figure I-1

Project Site Location

Figure I-2 Proposed Land Use



Project Boundary	
Golf Course Area	
Low Density Housing	LD
Medium Density Housing	MD
Sewage Treatment Plant	S.T.P.



The community will contain three principal types of dwelling units: (1) residential condominiums, (2) rental condominiums, and (3) single-family residential home sites. In addition to dwellings, the project will include a convenience commercial center, an outdoor theater and cultural center, and recreational facilities consisting of a championship golf course, golf clubhouse with pro shop and food and beverage services, tennis courts, swimming pools, and a network of bicycle and pedestrian pathways.

As a part of the overall community plan, a 20-acre parcel will be dedicated to the County of Kauai for expansion of Poipu Beach Park.

All structures will be low-rise, not exceeding three stories, and similar in architectural character to Moana's adjacent Kiahuna condominiums. The condominiums will consist of studio and one-bedroom units priced for moderate to upper income purchasers. The condominiums designed for the rental market will be offered at rents comparable to standard through deluxe hotel rates. The single-family residential home sites will be available for the construction of homes for moderate to upper income families and will be subject to architectural controls imposed by the developer.

The commercial complex will consist of up to 50,000 square feet of leasable area to accommodate restaurant, grocery, liquor, sporting goods, and similar convenience uses. The complex will be central to the community and will cater principally to residents within the project. It is anticipated that the commercial facilities will be operated as concessions by local Kauai businessmen. The golf course will be an 18-hole, 7,000+ championship facility, and will be open to public play. The course

will be designed and laid out so as to establish "islands" of clustered residential development, with the golf course functioning as both a recreational amenity and as a major open space and landscaped corridor within the project.

The Kiahuna Tennis Club, which will serve the proposed project as well as the present Kiahuna development, is partially complete, with eight tennis courts now in play and two additional courts, a swimming pool, changing rooms, pro shop, and a dining terrace with food and beverage service scheduled for completion in 1976. The club will be expanded to include up to 24 courts, as needed. The club will be open to the public, and public parking will be provided on the site.

The outdoor theater will be constructed near the county park to provide a facility with a stage, sound system, and dressing rooms for the performing arts. This facility will be made available to all community groups desiring to sponsor or present cultural events such as concerts, dance programs, and plays. The area dedicated to the theater will cover approximately three acres.

The network of bicycle and pedestrian pathways is developed to discourage use of the automobile in the project, as well as to provide a means of ingress and egress to and from the project to members of the public and to improve pedestrian and bicycling circulation for the Koloa-Poipu area.

Pertinent information with respect to land tenure, acreages, and zoning is presented in Table 1. Table 2 sets forth the acreages for each of the proposed uses.

TABLE 1

LAND TENURE AND ZONING INFORMATION  
MOANA PROJECT

Tax Map Key	Fee Owner	Lessee	Approx. Acreage	Existing Use	Current State LUC District	Proposed State LUC District	Present County Zoning	Proposed Land Use
2-6-04-152	McBrydel		18.00	Grazing	Ag	Urban	Ag	Golf Course (GC) and Open Space (OS)
2-8-12-12	Knudsen Trusts	Grove Farm	11.12	Grazing	Ag	Urban	Ag	GC/OS Residential (Res)
2-8-12-92	Grove Farm <sup>1</sup>	Poipu Ranch Co.	1.00	Grazing	Ag	Urban	Ag	GC/OS
2-8-13-22	Grove Farm <sup>1</sup>	Poipu Ranch Co.	4.70	Grazing	Ag	Urban	Open	GC/OS
2-8-13-42	Catholic Church	-	3.00	Church Grounds	Ag	Urban	Open	GC/OS
2-8-13-5	Grove Farm <sup>1</sup>	Poipu Ranch Co.	0.62	Grazing	Ag	Urban	Open	GC/OS
2-8-14-12	Knudsen Trusts	Poipu Ranch Co.	58.29	Grazing	Ag	Urban	Ag	GC/OS
2-8-14-5	Knudsen Trusts	Poipu Ranch Co.	345.10	Grazing	Ag	Urban	Ag	Tennis/Res
2-8-14-6	Knudsen Trusts	Poipu Ranch Co.	0.76	Grazing	Ag	Urban	Ag	GC/Comm/OS
2-8-14-7	Grove Farm <sup>1</sup>	Poipu Ranch Co.	5.36	Grazing	Ag	Urban	Ag	GC/OS
2-8-14-8	Knudsen Trusts	Poipu Ranch Co.	10.41	Grazing	Ag	Urban	Ag	GC/OS/Res
2-8-15-77	Grove Farm <sup>1</sup>	Poipu Ranch Co.	1.59	Grazing	Ag	Urban	Ag	Res/GC/OS
2-8-17-10	Knudsen Trusts	-	3.22	Vacant	Urban	Urban	Open/RR-20	GC/OS
2-8-17-11	Knudsen Trusts	-	5.57	Vacant with one dwelling	Urban	Urban	Open/STP/STC	County Park
2-8-17-13	Grove Farm <sup>1</sup>	-	1.25	Vacant	Urban	Urban	Open/STP/STC	County Park
2-8-17-14	Grove Farm <sup>1</sup>	-	0.86	Vacant	Urban	Urban	Open/STP/STC	County Park
2-8-17-16	Knudsen Trusts	-	1.20	YMCA	Urban	Urban	Open/STP/STC	County Park
2-8-17-24	Knudsen Trusts	-	7.94	Vacant	Urban	Urban	Open/STP/STC	County Park
2-8-17-25	Knudsen Trusts	-	2.70	Vacant	Urban	Urban	Open/STP/STC	County Park

<sup>1</sup> Under exchange agreement to Knudsen Trusts.

<sup>2</sup> Portion in General Plan request area.

TABLE 2

MOANA PROJECT PROPOSED LAND USES

480 - ACRE DEVELOPMENT

<u>Use</u>	<u>Approximate Acres</u>
Single-family Units (approximately 300 units)	100
Multi-family Units (approximately 1,150 units)	120
18-Hole Golf Course	150
Golf Clubhouse	2
Pro Shop	
Food Service Facilities	
Convenience Commercial Center	5
Restaurant	
Grocery Stores	
Sporting Goods Store	
Liquor Store	
Other Retail Activities	
Tennis Complex (expansion of present facilities)	10
10 Courts	
Tennis Clubhouse	
Outdoor Theater	3
Park Dedication to Poipu Beach Park	20
Roads, Bicycle and Pedestrian Pathways and Open Space	62
Required Infrastructure facilities (a sub- regional sewage treatment plant is presently under construction)	<u>8</u>
TOTAL	480 <sub>+</sub>

---

Source: Moana Corporation, 1975

## DEVELOPMENT PHASING

An estimate of the build-out for the entire project is shown in Table 3. Due to uncertainty in the marketplace, both in the demand for housing and in the growth of tourism to the Islands, the build-out schedule depicted in Table 3 will not in all likelihood be exactly realized. However, the direction and magnitude of the estimates should not vary considerably and should provide a realistic description of the resulting development.

The actual development by Moana Corporation will take place over a 15-year period. However, the build-out schedule shown in Table 3 describes the development over a 20 year period. This is because as the single-family lots are purchased, it is assumed that the construction by the individual owners of the single-family residences will be on a delayed basis. By analyzing the Moana Project over a 20-year period, a more realistic description of the overall impact of the project may be obtained.

## INFRASTRUCTURE REQUIREMENTS

### Water

The proposed 480-acre Moana project will generate an estimated average-day domestic water demand of approximately 600,000 gallons per day (gpd) at total build-out. This figure does not include irrigation for the golf course, which will obtain its water from either treated sewage effluent or brackish water from on-site wells. The golf course will require from 430,000 gpd to 1,000,000 gpd, dependent upon the season and climatological conditions.

TABLE 3

MOANA PROJECT BUILD-OUT SCHEDULE<sup>1</sup>

	Year <sup>2</sup>																				Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Single-Family Units	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	300 <sup>3</sup>
Houselots	4	8	12	16	20	20	20	20	20	20	20	20	20	20	20	16	12	8	4		300 <sup>4</sup>
Buildings																					
Multi-Family Units	100	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	1,150
18-Hole Golf Course	.5	.5																			1.0 <sup>5</sup>
Golf Clubhouse	1.0																				1.0 <sup>5</sup>
Convenience Commercial Center	.5				.5																1.0 <sup>5</sup>
Tennis Complex	.5	.5																			1.0 <sup>5</sup>
Park Dedication	1.0																				1.0 <sup>5</sup>
Bicycle and Pedestrian Pathways and Open Space	1.0																				1.0 <sup>5</sup>
Required Infrastructure	1.0																				1.0 <sup>5</sup>

<sup>1</sup>Prepared by Moana Corporation.

<sup>2</sup>Year 1 represents the 1977-78 fiscal year.

<sup>3</sup>Number of single-family houselots.

<sup>4</sup>Number of units.

<sup>5</sup>Proportion of facility completed.

According to the Moana Project build-out schedule, the major portion of the infrastructure will be laid on-site in the initial year of construction. Therefore, because the Koloa-Poipu water system is presently nearing capacity, it will be necessary for the Kauai Board of Water Supply to expand its existing facilities to accommodate this new development.

#### Sewerage

Upon completion, the proposed development is expected to produce about 466,000 gpd of raw sewage. The capacity of Moana's present system, servicing the Kiahuna condominiums makai of Poipu Road, is 75,000 gpd, and the system is now operating at capacity. Therefore, expansion of facilities is needed, and will occur at this plant site mauka of Poipu Road. The effluent is proposed to be used for golf course irrigation.

#### Circulation

Poipu Road is the major accessway to the Poipu area and forms the western and southern boundaries of the project site. Only one automobile entry point into the project is planned. This will be located directly across from the existing Kiahuna development accessway, makai of Poipu Road. This entry road will have a 56-foot right-of-way.

Hapa Road will be converted into a pedestrian/bicycle way, which will allow pedestrian and bicycle access to the various recreational facilities. By using limited access, there will be no through traffic, and thus it will be possible to preserve the rural character of the development.

### Electricity and Telephone

Based on an average of 405 kwh per dwelling unit per month for Kauai, the Moana Project will require about 587,000 kwh per month, with a maximum demand of 1,175 kw. This will be phased in gradually in conjunction with Kauai Electric Company's plans for expansion.

Telephone, cable television, and street lighting facilities will also be phased in gradually and their installation should present little, if any, problems.

### Gas

Because gas is used by 70% of the households on Kauai, it is expected to be used in the Moana Project, supplied by cylinder, bulk tank, or through a community feeder system. Again, no problems are anticipated in providing adequate service.

PART I

THE ECONOMIC AND SOCIAL IMPACT  
OF  
KIAHUNA GOLF VILLAGE

---

Prepared by:

McDONALD & SMART, INC.  
303 Sacramento Street  
San Francisco, California 94111

In association with:

DALY & ASSOCIATES  
950 Pacific Trade Center  
Honolulu, Hawaii 96813

I. SUMMARY OF ECONOMIC AND SOCIAL  
FINDINGS/PROJECT JUSTIFICATION

BACKGROUND

As an aid to understanding the socioeconomic aspects of the report, a general background in the technical approach and explanation of the interrelationships among the various research components discussed in Part I are presented below.

Section II of Part I describes the social and economic setting within which the Moana Project would be developed. This description is in largely statistical terms, including such subjects as ethnic population characteristics, income and age characteristics of the Kauai population, and projections as to future population growth. Also included in this section are data relating to the economy of Kauai and composition of its labor force.

Section III is an analysis of the housing market on Kauai. This analysis considers housing supply and demand for permanent residents, for tourists, and for non-resident purchasers of condominiums. Market data relating to the analysis of housing supply and demand, and the evaluation of housing "comparables" on Kauai, then are related to Moana's proposed project, with consideration given to such matters as quality, price, and sales record. From this analysis, the estimated annual absorption rates have been derived -- i.e., the number of units which it is believed that Moana realistically can sell annually throughout the course of the proposed development period. This section also considers the Project's potential for satisfying a significant portion of Kauai's un-met needs for permanent residential housing as well as the Project's potential for success in responding to the recreational condominium market.

A major purpose of the study has been to determine the consequences of the Moana Project in relation to the overall economy of Kauai. These consequences are of two kinds. The first kind of economic impact which has been considered relates to public costs and revenues which will result from the Moana Project. Section IV analyzes the major revenues which will be realized by the County and State governments as a result of the expanded tax base which will be a direct result of the Project. Following this is an estimate of the new public costs which will be incurred by the County as a result of the Project for such services, for example, as fire and police protection and schools. The analysis in Section IV is completed by estimating the net economic result to the County (in terms of costs and revenues) resulting from the proposed project as opposed to the net result of a "no project alternative."

The second major area of overall economic consequence is the Project's estimated impact upon private sector income and employment. This analysis is presented in Section V. Income and employment impacts are of two kinds, primary and secondary. In other words, there will be an increase in employment and income for Kauai residents as a result of people directly employed by the Moana Project. In addition, there will be a substantial increase in employment, income, and general economic activity in the business sector outside of the Project, but as a result of the Project. These increases of economic activity are caused by what is known as the "multiplier effect" of any substantial employment-generating project. The concept is that each such project creates more jobs, income, and total economic activity than those directly associated with the project. The technical basis for this analysis, and the estimates of the increases in private sector income and employment, are documented and set forth in detail in Section V.

## PERMANENT HOUSING MARKET

In relation to national standards, the Kauai market for permanent residential housing is very tight. According to the last Federal Housing Administration (FHA) survey in 1974, only 0.3% of all units were vacant. The rate of housing turnover on Kauai has been low in comparison to the rest of Hawaii. The annual turnover rate on Kauai was 9.6%, less than half the rate for civilian housing in the State as a whole.

During the first 15 years of its buildout schedule, the proposed Moana Project would provide 20 lots annually, or 8% of the projected annual demand on Kauai for single-family lots and dwellings and 75 units annually, or 30%, of the projected annual demand for multi-family units occupied by Kauai residents (see Table II-1). These figures are derived from projections of Kauai housing demand and an analysis of Kauai residents' ability to pay for housing at given income levels.

It is generally accepted that 25% of a household's gross income can be allocated to expenditure for housing. 16.7% of Kauai's households can afford homes priced at \$48,000 or higher. Approximately 38.6% can afford houses selling for \$33,000 or more.

Based on analysis of Kauai income levels, approximately 40% of the households on Kauai, assuming 1974 income levels, can afford the lowest priced lots in the Moana Project. Assuming a total population of 32,000 in 1977 (when lots are sold) and approximately 8,900 households, the lowest priced lots would be affordable by 3,560 Kauai households. The \$7,500 lots, assuming housing construction costs of \$27,500, could be purchased by 35% of the residents, or 3,115 households.

Similarly, the \$10,000 lots will be within the means of approximately 25% of the residents, or 2,225 households. The \$15,000 lots, assuming construction costs of \$35,000, can be afforded by approximately 16% or 1,420 households.

Consequently, it is clear that the Moana Project, based on its present schedule of anticipated lot prices, will afford an opportunity to meet a substantial portion of the presently unfilled demand for permanent housing for Kauai residents. Moreover, that demand can be met in a quality, planned community subject to environmental and quality design controls related to the construction of single-family dwelling units.

#### CONDOMINIUM SALES MARKET AND MOANA PROJECT ABSORPTION RATES

Prior to 1973, most of the condominium developments on Kauai experienced an initial surge of sales when the units were first placed on the market. However, in 1973 and 1974, the condominium market slumped significantly not only on Kauai but throughout the country. This market slump is not related to any perceived decline in the attractiveness of condominium ownership. Rather, it is a function of the problems which exist in the economy as a whole. With a restoration of strength in the general economy, it is expected that the long-range trend toward increased second-home condominium ownership will increase.

Notwithstanding the generally depressed condominium market, in 1973 and 1974 Moana Corporation's existing Kiahuna project sold remarkably well during that period. We attribute this sales experience -- which ran counter to market trends -- to two factors: (a) the product's superior quality, and (b) the development by Moana Corporation of a financially sophisticated investor market.

Moana Corporation has succeeded in selling an average of ten units per month at Kiahuna during a period of economic downturn, an absorption rate which was achieved without any significant advertising campaign.

Based on Moana Corporation's sales record, the quality of its planned community condominiums relative to its competitors, and the assumption of an improving U.S. economy, we estimate that the Moana Project can achieve an absorption rate of at least 100 condominium units per year. In addition to the competitive strength of the Moana product, the Project has the further advantage of its location in the Poipu area. Our research indicates that this is a clearly distinct market within Kauai, with a superior and growing sales appeal relative to other areas of the Island.

#### HOTEL-CONDOMINIUM VISITOR MARKET

The success of the Moana Project partially depends upon the future strength of the Hawaii visitor hotel and condominium markets. Moreover, the total economic impact which we have estimated as resulting from the Project is related to assumptions regarding the volume of visitors who would rent Project condominiums.

In recent years, approximately one-third of the State's visitors have spent time on Kauai. Hence, the economic impact of tourism is substantial. The flow of visitors has increased steadily in the last decade. In 1964, there were 133,960 westbound visitors. In 1974, there were 601,703 westbound visitors. We expect the tourism growth rate to continue.

Moana Corporation has succeeded in selling an average of ten units per month at Kiahuna during a period of economic downturn, an absorption rate which was achieved without any significant advertising campaign.

Based on Moana Corporation's sales record, the quality of its planned community condominiums relative to its competitors, and the assumption of an improving U.S. economy, we estimate that the Moana Project can achieve an absorption rate of at least 100 condominium units per year. In addition to the competitive strength of the Moana product, the Project has the further advantage of its location in the Poipu area. Our research indicates that this is a clearly distinct market within Kauai, with a superior and growing sales appeal relative to other areas of the Island.

#### HOTEL-CONDOMINIUM VISITOR MARKET

The success of the Moana Project partially depends upon the future strength of the Hawaii visitor hotel and condominium markets. Moreover, the total economic impact which we have estimated as resulting from the Project is related to assumptions regarding the volume of visitors who would rent Project condominiums.

In recent years, approximately one-third of the State's visitors have spent time on Kauai. Hence, the economic impact of tourism is substantial. The flow of visitors has increased steadily in the last decade. In 1964, there were 133,960 westbound visitors. In 1974, there were 601,703 westbound visitors. We expect the tourism growth rate to continue.

The occupancy rate for tourism lodging is significantly higher for Kauai than for other Neighbor Islands, and occupancy rates in the Poipu area are higher than in Kauai generally. The annual average occupancy rate for the Neighbor Islands in 1974 was 69.4%. On Kauai as a whole, the annual rate was 78.1%. And, for the Poipu area, it was 80.7%.

Using conservative estimates of visitor growth (which tends to overstate the potential impact of the Moana Project), we have calculated visitor totals for Kauai and an average daily visitor amount from now until 1995. We estimate that, in 1968, the Moana Project non-resident population will comprise 2.15% of total overnight visitors. By 1995, we estimate the Project will accommodate 17.95% of such visitors.

#### PROJECT-RELATED PUBLIC COSTS AND REVENUES

Section IV of this report estimates the increased revenues which will be realized by the County and the State as a result of the proposed Project and the increased costs to the County and the State as a result of the Project. Our summary of the results of those analyses follows:

The estimated net cumulative revenues to the County from the Project upon its completion will be \$12,447,000. The cumulative revenue to the State is estimated at \$5,354,000.

If the Project is not built, the net revenue to the County from the subject property is estimated at \$453,000 over the same period. Hence, the opportunity cost to the County if the Project is not built is estimated at \$11,993,000 at the end of the period. ("Opportunity cost" equals project net revenue less "no project alternative" net revenue.)

After the Project is fully developed, public revenues to the County of Kauai are estimated to be \$1,171,000 annually. Revenues to the State are estimated to be \$293,000 annually.

#### PROJECT-GENERATED INCOME AND EMPLOYMENT

Our analysis in Section III estimates the Moana Project's impact upon private sector income and employment. We have analyzed both primary and secondary impacts -- i.e., jobs and income generated through direct employment by the Project and jobs and income generated in the Kauai economy outside of the Project, but which are a result of the Project.

As of June, 1975, Kauai's unemployment rate was estimated at 9.6% of the County's estimated labor force of 15,200 persons. Of the insured unemployed, contract construction shows the largest number of claimants with 24.9%.

During the Moana Project's projected 15-year period of condominium construction, the Project will generate an average of 105 jobs annually. It is estimated that 93 of those jobs will be filled by local Kauai residents. Average total annual wages to be paid to construction workers are \$1,313,000.

Upon scheduled completion of the condominiums in year 15, the Moana Project will provide at least 390 permanent jobs, of which Moana estimates that 383 will be filled by permanent Kauai residents. Average total annual wages to be paid permanent employees are estimated at \$3,637,600.

The secondary economic impacts of the Moana Project are substantial. The average wage dollar paid in Kauai get spent 3.09 times during the year. On the average, a construction job creates 1.41 jobs throughout the County's economy, and a hotel-related job creates 1.20 jobs throughout the economy.

The total annual economic change estimated to occur in Kauai as a result of \$1,313,000 in construction wages associated with the Project is approximately \$4,000,000. The total annual economic change estimated to occur due to the Project's approximately \$3,638,000 in tourist activity wages is \$11,251,000.

The annual Project permanent employment wage -- which ranges from \$811,200 in year 1 to \$3,637,600 beginning in year 15 -- is estimated to generate total economic changes which range from approximately \$2,581,000 in year 1 to \$11,251,000 in year 15 and thereafter.

Combining the above estimates of economic change, the total gross annual economic change ranges from \$8,695,000 in year 1 to \$20,263,000 in year 15. Thereafter, it declines (because of termination of construction) and remains at approximately \$14,888,000 annually.

#### SOCIAL IMPACT

A key element to be considered by the County in evaluating the merits of the proposed development is the impact which the development will have upon the character of the affected area's social structure and its values. Those values are of several kinds. Taken together, they comprise what is referred to as a community's "lifestyle." An overall lifestyle is the produce of a number of factors, including the following:

- Family structure and familial living patterns
- Economic standard of living
- Recreational opportunity
- Cultural opportunity
- Living densities
- Degree of isolation or mobility
- Concept of community

A fundamental frame of reference for assessing quality-of-life questions is an examination of the societal differences between rural areas and urbanized areas. The analysis can be helped by beginning with the concept of an extreme polarization of social structures. At one pole exists the rural extreme, characterized by minimal population, widely separated households, extreme social isolation, few opportunities for social and cultural intercourse, and provision of very few public services. At the other pole is the community which is highly urbanized in a relatively compact area, which is characterized by congestion, little living space per household, opportunities for intensive social and cultural intercourse, and provision of many public services. Both situations are characterized by distinct advantages and disadvantages. Between these two poles of extremely rural characteristics on the one hand and extremely urban characteristics on the other, there exists a spectrum of possibilities. Hypothetically, there exists an optimum development alternative which is capable of eliminating the disadvantages inherent in each extreme, while cultivating a creative mix of the benefits typical of each extreme.

The County of Kauai obviously is not characterized at present by either extreme rural characteristics or extreme urbanized characteristics. Depending on one's social and economic values, one can argue, in respect to any area, for preservation of the status quo or for further development. Preservation of the status quo in Kauai would have clearly identifiable social benefits and clearly identifiable social costs. Further development -- depending on its character -- would also have clearly identifiable social benefits and clearly identifiable social costs. Hence, the decision-making process must be characterized by careful evaluation of the advantages and disadvantages of no development, on the one hand, and further development, on the other. If the decision is that the advantages

to the people of Kauai of further development are greater than those which would be realized through preservation of the status quo, the task of the decision-maker then becomes insistence upon a kind of development which will preserve those social values of greatest value to the County's residents, while affording the social and economic benefits which can be realized from a carefully planned and implemented development.

In our judgment, the proposed Moana Project will make a substantial contribution to the economic growth of Kauai. That economic growth can contribute in turn to the realization of distinct social benefits associated with the reduction of structural unemployment and can do so while minimizing the adverse impacts which are characteristic of some kinds of developments. The Project will result in greater urbanization of the Koloa-Poipu area. However, the population growth, and the distribution of that growth, will occur in a fashion which avoids the adverse social impacts often associated with urbanization. As noted in the project description, the Project will have a low density, with units clustered so as to maximize open space. The ratio of total land area to total housing area is such that there will be no sense of congestion among people living on the property.

Of course, the County's broader concern relates to the Project's impact upon the community as a whole, and not just upon those living on the Project. In our judgment, the configuration of the project and the architectural style of the units -- as represented by the condominiums in the present Kiahuna Project -- are of a character highly consistent with the existing lifestyles and "sense of place" of residents of the Koloa-Poipu area. The concentration of structures and creation of building masses will be wholly avoided in the Moana Project. The low-rise quality of

the structures, combined with their dispersal, will create a community with a sense of "lightness," which is consistent with the existing character of the area and which is less intrusive upon the conscious perceptions of the people who live in the area than other development alternatives characterized by massive structures. While this point may seem more appropriate to an environmental impact analysis, it is important to emphasize it here since a physical environment has a major impact upon the attitudes, sense of well-being, and lifestyle of the affected society. An environmental impact is, in fact, a social impact.

While we believe that the physical existence of the Project will not have an adverse social impact, it is obvious that an estimated addition of an average population of 2,688 people will have an impact upon the lifestyle of the Koloa-Poipu area. However, we think that the added population would represent simply a continuation of an existing trend which in fact represents the official policy of the County. The County General Plan designates the Koloa-Poipu area as a hotel/resort area, and that designation clearly is a sound one, given the natural attractiveness of the area for recreational and tourism uses. The major question, then, is not whether resort facilities should be developed in the area; rather, it is how many people can be accommodated there without damaging the unique quality of the area, and what kinds of developments will best encourage development of a visitor population whose values are consistent with existing Kauai lifestyles and a rate of population growth sufficiently slow to permit ease of assimilation.

It is important to emphasize that, while the condominiums in the Moana Project will be individually owned by largely absentee owners, the economics of the project are heavily dependent upon

its successful operation as a hotel facility. In other words, it is expected that the condominiums will be occupied by large numbers of renters as well as homeowners. At the same time, there are differences between condominium and conventional hotel occupancy patterns. The marketing of condominium rentals in vacation areas is geared toward developing longer stays by visitors than is the case with conventional hotels. Consequently, most condominium renters, and all condominium owners, are highly committed to the particular area in which the condominium is located because of the commitment that is made both financially and in length of visits.

In evaluating the potential impact of this added population upon the Koloa-Poipu lifestyle, it is important to assess the characteristics of that population and their motives for coming to the area. There is a large range of choices in Hawaii for recreation oriented visitors. That choice ranges from Waikiki as an example of extreme urbanization and "big city" recreational attractions to Kauai as an example of low key, leisure activity oriented toward the attractions of a beautiful natural environment. Visitors who come to Kauai for extended stays (which is characteristic more of condominium owners and guests than of conventional hotel guests) do so because they have made a clear choice. They have made that choice largely because they are attracted by the Kauai lifestyle more than they are attracted by a Waikiki lifestyle. They are not primarily seeking massive entertainment facilities. They are seeking relative seclusion in an area which offers an escape from dense urbanization and an opportunity for a variety of physical outdoor activities. The condominium owner and extended guest is motivated to participate in the existing lifestyle rather than to intrude upon it or change it.

This is not to say that changes will not occur; they will. But it is our belief that the occupants of the Moana Project will tend to have greater sensitivity to, and appreciation of, the existing lifestyle than do short-term, tour-oriented guests of conventional hotels.

Moreover, the physical character of the development will tend to minimize the impact which such a relatively large number of people normally would have on the lifestyle of an area. Our survey of travel behavior among guests at the present Kiahuna project demonstrates that occupants of a comprehensively planned recreation-oriented community with major recreational facilities on-site travel relatively little off-site. These findings coincide directly with our findings in other traffic studies which we have conducted regarding planned recreational communities elsewhere. In analyzing the travel motives and behavior of recreational travelers, we have developed what we describe as a project's "containment factor." The concept is simple. The characteristic measured is the ability of a given development to contain occupants on-site.

Our studies show a direct relationship between the ability of a development to contain occupants on-site and the magnitude and quality of recreational facilities on-site. The Moana Project will contain at least ten tennis courts, a championship golf course, an outdoor theater, swimming pools, bicycle paths, and direct transportation by jitney from the Project's location mauka of Poipu Road to the beach front. When completed, the Project will have the largest and highest quality recreational complex on Kauai. Our survey indicates that such a project will reduce off-site travel very substantially from the vehicle trip standard that would normally be used to project travel volume for an equivalent population.

Finally, the incremental phasing of the Project means that its social impact will be absorbed gradually over an extended period of time. Sales of 100 condominium units a year are anticipated, which means that there is a much greater opportunity for assimilation of the added population than would be the case if the Project were built all at one time or if the Project were a hotel.

The foregoing analysis deals principally with the impact of a substantial increase in the population of the Koloa-Poipu area as a result of the Moana project. The discussion was general in nature and necessarily qualitative and subjective in character. However, there are a number of areas in which social impacts can be discussed from a quantitative frame of reference, and other areas which can be evaluated specifically if not quantitatively. The areas of inquiry subject to quantitative consideration relate to economics. Hence, at this point, it is important to discuss the social consequences of the Moana project's economic impacts. Indeed, the great majority of areas of social change relate directly to the economic impacts of the project. These relationships between economics and social impact are discussed below:

#### Employment

As noted earlier, Kauai's unemployment rate in June, 1975 was estimated at 9.6%. Among the claimants for unemployment insurance benefits, contract construction workers are the largest segment. They comprise 24.9% of the total. Welfare payments have increased dramatically in the last ten years. About 15% of Kauai's residents received welfare assistance in 1974. The food stamp program alone assisted about 1,000 families.<sup>1</sup>

---

<sup>1</sup>State of Hawaii, Department of Social Services and Housing.

The economy of Kauai is based on two major industries, sugar and tourism. Tourism has been a consistent growth industry since the early 1960's, while agriculture has gone into a declining trend. Since 1960, the pineapple industry has virtually disappeared. Even though the sugar industry may be economically viable, it is a declining employment base. Since 1960, the sugar industry has cut back on employment by 25%, due to the rise in production efficiency. It is clear that tourism, and tourism-related activities, is the only viable growth industry from the standpoint of employment on Kauai.

Moana Corporation's stated intention is to maximize employment among present residents of Kauai and to minimize the importation of labor. Hence, of the 105 construction jobs to be provided annually, Moana estimated that 93 will be filled by local Kauai residents, and that of the 390 permanent jobs which will exist at the completion of the project, only 7 will be filled by imported labor. (These estimates reflect present Kiahuna employment patterns.) These jobs can have a major impact in reducing the County's unemployment and in reducing the mounting costs of public welfare. Fuller employment in the County will raise the standard of living of many under-employed residents, and will reduce the social costs of unemployment which -- in addition to welfare payments -- include crime, substandard health care, and general social blight.

#### Housing

Inadequate permanent housing exists on Kauai. As documented elsewhere in this report, the lot prices in the Moana project will be within the economic reach of approximately 40% of the households on Kauai. Hence, the project will afford an opportunity for large numbers of Kauai residents who wish to build single-family dwellings to do so in a planned community offering a high quality of life. The availability of lots for

permanent housing within the Moana community will reduce the need for increased parcelization and lot and block development in the area, thus enabling the maintenance of more open space in the larger community and reducing the trend toward urban sprawl.

#### Local Business Opportunities

Moana Corporation has stated that it does not intend to operate the commercial facilities in the convenience shopping center. Rather, it prefers that such facilities be operated as concessions by one or more of the area's existing local merchants. The convenience shopping center is not expected to divert business from existing establishments in the area, since the center will serve principally the added population resulting from the Moana project. Hence, local businessmen will have the opportunity to open new shops, in addition to their present ones, as a result of the project.

#### Secondary Economic Impact

We have discussed at length elsewhere the secondary employment and economic impact which will be generated by the Moana project in the economy generally. The social consequences of these secondary impacts are clear. In addition to the jobs and resulting income discussed above as a result of direct project employment, additional jobs will be created throughout the economy as a result of the project's "multiplier effect." Those jobs, if taken by presently unemployed Kauai residents, will further reduce the unemployment rolls, welfare payments, and other social costs of unemployment. (Our interviews with County agencies and our statistical analyses confirm that there is substantial structural unemployment, and that most of the created jobs likely will be filled by Kauai residents, rather than by imported labor.)

### Recreational Opportunity

A critical component of a society which offers its members a high quality of life consists of maximum recreational opportunities. According to the State Comprehensive Outdoor Recreation Plan (SCORP Report) prepared for the Department of Planning and Economic Development, there are deficits in the availability of public recreation facilities, including parks and tennis courts. Development of the Moana project will result in important social benefits to the residents of Kauai by making available significant new recreational facilities. The Moana Corporation proposes to dedicate 20 acres of land to the County to expand the beach park at Poipu. The developed park would include picnic tables, pavilions, park and open space. In addition, the project tennis courts and golf course will be open to the public for modest fees. The Moana project tennis courts will not only enhance recreational opportunities for Kauai residents by making additional tennis courts available for their use, the Moana courts will help relieve the congestion on the existing Koloa courts caused by tourist use, since the Moana courts are located closer to the major hotels in the Poipu area.

### Cultural Opportunities

There is a major deficit in facilities on Kauai for use by performing artists. The Moana project will include an outdoor amphitheater and cultural center. These facilities will be available for the use of local artistic groups and touring artistic groups. All performances will be open to the public. This facility provides a unique opportunity for cultural intercourse among oriental, Hawaiian, and haole groups. Mainland

visitors will benefit from Hawaiian performances in a natural, outdoor setting. Local residents of Kauai will have the opportunity to attend a variety of musical and theatrical events which have not been widely available in the past.

#### County Finances

It appears that Kauai may be approaching a condition of permanent operating deficits at current tax rates. If that is, in fact, the case, only three alternatives are available to the County. The first is to raise the taxes of present Kauai residents. The second is to reduce public services. The third is to expand the tax base without generating more public service costs than increased revenues.

The Moana project, and its secondary effects, will have a significant impact in expanding the tax base while at the same time reducing the unemployment which is a prime cause of a number of social costs. The "no development" alternative adds nothing to the tax base. Failure to expand the tax base -- either through development of the subject property or development of other properties with an equivalent cumulative tax-generating potential -- will have an ultimately adverse social impact. Because of the County's approaching deficit situation, social services associated with unemployment may have to be cut at the same time that unemployment remains high. The Moana project is a source of both substantial employment and new public revenues that far exceed the new public costs which would be associated with the project.

In summary, it should be re-emphasized that the Moana Project will bring changes to the Koloa-Poipu area. However, it is our judgment that the character of the project is such that it will contribute substantially to the economic development of the County without the potentially adverse social impacts that would result from other development alternatives.

## II. SOCIAL AND ECONOMIC SETTING

### GENERAL DESCRIPTION OF THE COUNTY

Kauai County consists of the Islands of Kauai and Niihau. For purposes of this report, the discussion will be limited to the Island of Kauai.

The land area of the island is 549 square miles. The County's population, according to the State Department of Planning and Economic Development (DPED), was 31,600 in July, 1974. The major sources of employment are tourism, agriculture, and contract construction.

### POPULATION CHARACTERISTICS

There are a number of different population figures for the current residential population of Kauai due, perhaps, to the fact that there has been no formal census taken for five years. The 1970 U.S. Census indicated that there were 29,524 people living on Kauai (not including Niihau). The State DPED figures for 1974 show an increase to slightly over 31,000 residents on the Island of Kauai.

The largest ethnic groups on Kauai, as a percentage of total population in 1970, were as follows:

<u>Origin</u>	<u>Percent</u>
Japanese	32.9%
Filipino	27.3
Caucasian	26.0
Hawaiian	10.1
Chinese	1.8
Other	1.9

## Survey Results of the Kauai Population in 1974

The results of a recent University of Hawaii population survey for the Island of Kauai are presented in Table II-1. These findings reveal that approximately 37% of the households earn over \$14,000 annually, while 20% earn less than \$6,000 per year. Roughly 30% of the adults graduated from high school and 10% from college. Almost 54% of the adults were born in Kauai County, and two-thirds of the total were born in Hawaii. Over two-thirds of the adults had lived in Kauai for more than twenty years, and only 10% had lived in the community for less than four years.

### Population Characteristics of Koloa-Poipu

The area of primary concern in this report is the Koloa-Poipu district, designated as Census Tract 406 in Figure II-1. This area contained 3,141 residents in 1970, representing a 12.2% gain over 1960. Census Tract 406 contained 924 households in 1970; approximately 51% of the occupied housing units were owner-occupied.

According to the University of Hawaii survey, the median household income in Koloa-Poipu is \$10,600; the median household size is three persons; and approximately 50% of the area's adults were born on Kauai.

### Population Projections

There are a number of different population projections for Kauai and there often are significant differences among the various projections, depending largely upon the assumptions utilized. The table below represents a recent projection made by DPED's Hawaii State Census Tract Committee.

TABLE II -1

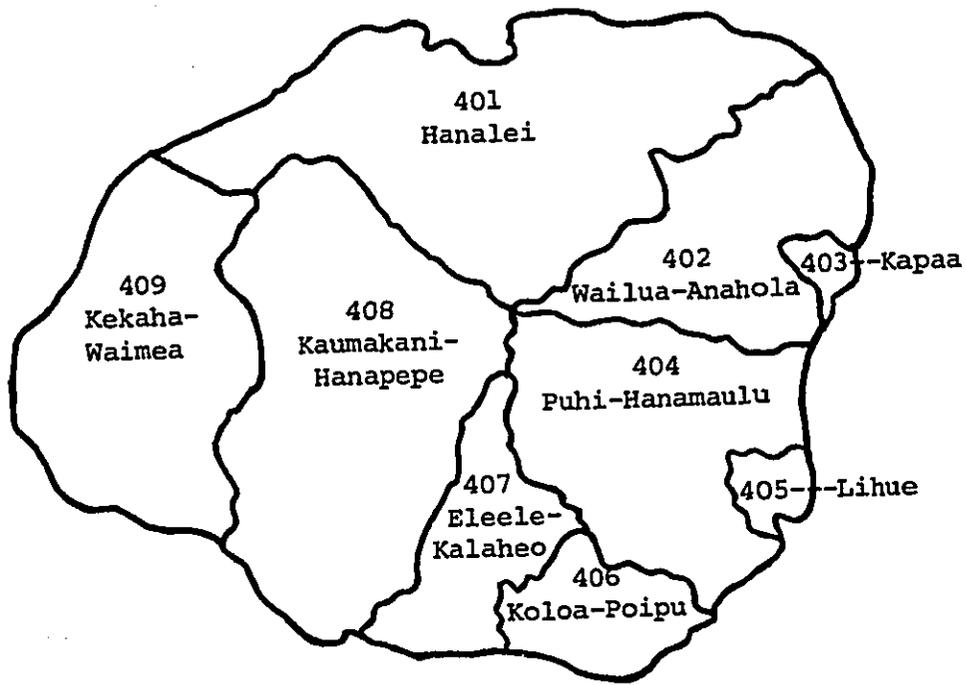
POPULATION CHARACTERISTICS IN PERCENTAGES, KAUAI, JULY-AUGUST, 1974<sup>1</sup>

Characteristics	Percentage	Characteristics	Percentage
Household Income		Birthplace of Adults	
\$0 - \$ 1,999	3.8	Kauai County	53.6
\$ 2,000-\$ 3,999	6.6	Oahu	8.7
\$ 4,000-\$ 4,999	4.8	Maui County	1.6
\$ 5,000-\$ 5,999	4.8	Hawaii County	2.3
\$ 6,000-\$ 6,999	6.6	Japan	2.8
\$ 7,000-\$ 7,999	7.2	Philippines	14.8
\$ 8,000-\$ 8,999	7.7	Mainland	14.3
\$ 9,000-\$ 9,999	3.8	Other	2.0
\$10,000-\$11,999	8.7	Number of Years Adults in the Community	
\$12,000-\$13,999	9.3	0- 3	10.5
\$14,000-\$19,999	20.1	4-10	11.3
\$20,000-\$24,999	8.1	11-20	11.9
\$25,000 and above	8.6	21-40	29.1
Educational Attainment of Adults		41 or more	37.2
None	1.9	Ages of All Residents	
Grades 1 through 3	4.9	0- 4	8.3
Grades 4 through 7	10.8	5- 9	9.0
Grade 8	9.5	10-14	10.4
Grades 9 through 11	9.6	15-19	10.9
High School Graduate	30.3	20-24	8.6
College, Not Completed	22.8	25-29	7.2
College Graduate	10.2	30-34	5.9
Ethnicity of Adults		35-39	4.6
Hawaiian or Mixed Hawaiian	14.0	40-44	4.8
Filipino	21.9	45-49	6.6
Haole	16.2	50-54	6.4
Portugese	8.1	55-59	5.0
Japanese	30.4	60-64	3.8
Other	9.4	65-69	3.7
		70-74	2.7
		75 and older	2.0

<sup>1</sup> Kauai Socioeconomic Profile, Center for Non-Metropolitan Planning and Development, University of Hawaii.

FIGURE II-1

CENSUS TRACTS ON KAUAI



<u>Year</u>	<u>Kauai Population</u>	<u>Annual Population Growth Rate</u>	<u>Kauai as Percentage of Total State Population</u>
1980	37,000	2.20%	3.94%
1990	46,000	2.32	4.08
2000	55,000	1.85	4.11
2010	64,000	1.51	4.01
2020	76,000	1.73	3.97

It would appear that these projections may overstate anticipated population growth on Kauai. Inasmuch as the population currently is estimated at approximately 31,000, it is unlikely that there will be 37,000 residents by 1980. Accordingly, we have revised the population estimates downward to what appears to be a more realistic rate of change.

<u>Year</u>	<u>Kauai Population</u>	<u>Koloa-Poipu Population</u>
1975	31,000	3,500
1980	34,000	3,700
1985	37,337	4,170
1990	41,000	4,700

Population growth resulting from the proposed Moana Project is given in the table on the following page.

## THE ECONOMY OF KAUAI

### General Characteristics of the Economy

The economy of Kauai is largely dependent upon agriculture and tourism for primary and secondary employment. That is, many of the jobs on Kauai in the service sector, retail trade, and construction exist largely because of the demand created by agriculture and tourism.

TABLE II-2

POPULATION GROWTH AS A RESULT OF THE MOANA PROJECT<sup>1</sup>

	Years <sup>2</sup>									
	1	2	3	4	5	6	7	8	9	10
<b>Single-Family Units</b>										
Net Resident Population	6	18	36	60	90	120	150	180	210	240
Current Resident Population	5	15	30	50	75	100	125	151	177	203
<b>Multi-Family Units</b>										
Non-Resident Population	132	255	378	501	624	747	870	993	1,116	1,239
Total Estimated Annual Population	143	288	444	611	789	967	1,145	1,324	1,503	1,682
<b>Single-Family Units</b>										
Net Resident Population	270	300	330	360	390	414	432	444	450	450
Current Resident Population	229	255	280	305	330	350	365	375	384	384
<b>Multi-Family Units</b>										
Non-Resident Population	1,362	1,485	1,608	1,731	1,854	1,854	1,854	1,854	1,854	1,854
Total Estimated Annual Population	1,861	2,040	2,218	2,396	2,574	2,618	2,651	2,673	2,688	2,688

<sup>1</sup> McDonald & Smart, Inc.

<sup>2</sup> Year 1 represents the 1977-78 fiscal year.

The State Department of Labor and Industrial Relations compiled statistics on employment in 1972. This report, Employment and Payrolls in Hawaii, 1972, indicated that there were 1,700 agricultural employees, 1,449 jobs in manufacturing, 1,886 in retail trade, and 2,523 in services. Agriculture and food processing, which had accounted for 50% of employment in 1960, declined to 32% by 1972. It is clear that the drop in sugar and the phase-out of pineapple employment have not been offset by a commensurate rise in diversified agriculture.

During the same time period (1960-1972), the number of jobs in services grew from 9% to 27% of total employment.

Major Employers

The table below indicates the major sources of employment on Kauai in 1974.

<u>Industry</u>	<u>Percentage of Total Employment</u>
Sugar	19.4%
Hotels	12.3
State Government	9.7-
Construction	6.3
County Government	5.7-
Sub Total	<u>53.4%</u>

Major Income Generators in the Economy

It is useful to examine the amount of wages paid as well as the number of jobs provided. The following information was provided by the State Department of Labor and Industrial Relations.

Wages Paid in 1972	
Industry	Wages (\$000)
Pineapple and Sugar Processing	\$ 9,058
Retail Trade	8,352
Hotels	6,137
Communication and Utilities	4,994
Medical/Health Services	3,173
Building Construction	2,643
Transportation	2,577
Other	<u>22,272</u>
Total	\$59,206

### Labor Force Statistics

Table II-3 represents an annual summary of employment statistics from 1971-1975 compiled by the State Department of Labor and Industrial Relations. The most recent survey (June, 1975) found that the current labor force consists of more than 15,000 individuals and that approximately 1,500, or 9.6%, are unemployed. Of the total unemployment, 24.9% were formerly employed in contract construction.

Appendix A shows the unfilled job openings by counties for January, 1975. Unfilled job openings data provide information about the employment demand and supply situation currently existing. The data are fairly comprehensive, enabling a detailed examination of unfilled job openings by exact job category.

Appendix B shows the occupational employment trends by employment category for the various counties. The information contained in this Appendix, along with Appendix A, provides a complete background analysis of the current employment demand and supply conditions for Kauai County.

TABLE II-3

KAUAI LABOR FORCE<sup>1</sup>

	1971	1972	1973	1974	1975 <sup>2</sup>
Civilian Labor Force	13,550	14,470	14,730	14,275	15,200
Unemployed	700	920	930	1,175	1,500
Unemployment rate	5.2%	6.3%	6.3%	8.2%	9.6%
Employed	12,850	13,530	13,780	13,150	13,700
Contract Construction	450	400	500	633	800
Manufacturing	1,600	1,480	1,450	1,375	1,400
Transportation, Communication, Utilities	1,050	980	1,060	1,175	1,200
Trade	2,000	2,000	2,160	2,300	2,300
Finance, Insurance, Real Estate	250	290	300	300	400
Services and Miscellaneous	2,100	2,640	2,700	2,542	2,500
Hotel	1,000	1,330	1,280	1,250	1,100
Other	1,100	1,310	1,400	1,292	1,400
Government	2,200	2,280	2,220	2,158	2,300
Federal	300	330	320	208	200
County	600	650	610	633	700
State	1,300	1,300	1,280	1,250	1,400
Agriculture	1,650	1,720	1,680	1,392	1,500
Sugar	1,500	1,500	1,540	1,300	1,400
Pineapple	50	40	--	--	--
Other	100	180	130	100	200

<sup>1</sup> Labor Force Estimates, Department of Labor and Industrial Relations, State of Hawaii.

<sup>2</sup> Preliminary estimate for June, 1975, Labor Area Summary, Department of Labor and Industrial Relations, State of Hawaii.

### III. MARKET ANALYSIS

#### KAUAI HOUSING MARKET ANALYSIS

The intent of this section is to present a brief overview of the housing market on Kauai. The prevailing supply and demand factors are explored as are housing price characteristics and the ability of residents to buy or rent adequate shelter. The results of a housing study conducted by the Mayor's office are also reported, as well as the current status of land sales on the Island.

#### Housing Supply and Demand

##### a. Construction Costs

Table III-1 presents a comparison of housing and construction cost indices for Honolulu and the State of Hawaii. The base, represented by 100, is 1967 for all indices used. This table indicates that the consumer price index for all housing (old and new) rose 38.6% between 1967 and 1974. During the same period, the construction cost of new dwellings rose roughly 70-75% for single-family residences and for high-rise buildings.

Table III-2 shows the construction cost increases broken down into major components. This indicates that the highest increase over the 1967-1975 period has been in labor costs; the increase in materials cost (approximately 70%) was roughly 10% below the rise in labor rates. The smallest increase, 50%, was in the cost of concrete. Concrete experienced only minor increases in the late 1960's and early 1970's, but the escalation has risen dramatically since 1973.

TABLE III-1

COMPARISON OF HOUSING AND CONSTRUCTION COST INDICES: 1965 TO 1974<sup>1</sup>  
(1967=100)

Year	Hawaii Consumer Price Index for Housing	Honolulu Construction Cost Index	
		Single-Family Residences	High-Rise Buildings
1965	92.2	90.4	90.8
1966	96.4	95.6	95.8
1967	100.0	100.0	100.0
1968	104.5	106.7	105.2
1969	109.6	115.2	110.8
1970	115.7	118.0	117.9
1971	120.3	125.7	125.1
1972	124.3	135.2	133.6
1973	128.8	154.7	144.9
1974	138.6	164.6	163.7
1974 (December)	--	171.6	174.4

<sup>1</sup>Annual Averages

Sources: Bank of Hawaii and First Hawaiian Bank

TABLE III-2

CONSTRUCTION PRICE INDEX BY MAJOR COMPONENTS: 1969 TO 1975  
(1967=100)

Year	Labor (Wages and Benefits)		Materials <sup>1</sup>		
	High-Rise Construction	Single-Family Construction	High-Rise Construction	Single-Family Construction	Concrete
1969	116.11	115.16	104.73	115.33	106.4
1970	125.20	124.53	109.73	112.92	109.9
1971	137.68	137.41	110.76	116.51	111.9
1972	150.04	150.61	114.61	123.06	115.6
1973	160.64	160.85	126.67	150.00	121.6
1974	175.55	171.58	154.59	159.01	135.4
1975 <sup>2</sup>	179.51	179.72	167.77	164.57	150.3

<sup>1</sup>Materials price index includes the cost of concrete.

<sup>2</sup>1975 price index is the average for January through April.

Source: First Hawaiian Bank Research Division.

b. Construction Levels

The table below presents a summary of authorized housing construction and demolition on Kauai from 1970-1974. This indicates that construction peaked in 1972, with authorization of 522 single-family dwellings and 367 multi-family units. Unit demolitions, on the other hand, have declined steadily from a high of 112 in 1970 to the 1974 level of 73.

TABLE III-3

PRIVATE RESIDENTIAL CONSTRUCTION AND  
DEMOLITIONS AUTHORIZED ON KAUAI, 1970-1974

Year	New Housing Permits <sup>1</sup>				Units Demolished <sup>2</sup>
	Single-Family		Multi-Family		
	Units	Value (\$000)	Units	Value (\$000)	
1970	302	6,572	91	1,435	112
1971	348	7,758	94	1,462	87
1972	522	12,268	367	6,793	82
1973	426	11,698	347	8,999	60
1974	396	11,591	302	7,374	73

<sup>1</sup>Private Construction on Neighbor Island, Bank of Hawaii, Construction in Hawaii, 1975.

<sup>2</sup>Kauai County Department of Public Works (Building Division).

c. Vacancy Rates and Housing Turnover in Kauai

Housing vacancy rates on Kauai have been quite low for the past several years. Table III-4 shows the vacancy trend from 1967 to 1974. The last FHA survey, in 1974, indicated that only 0.3% of all units were vacant, and only 95 units surveyed were under construction. This finding substantiates the claim by public

officials and residents on Kauai that the housing supply is very tight.<sup>1</sup>

TABLE III-4  
HOUSING VACANCIES ON KAUAI, 1967 TO 1974

Survey <sup>1</sup>	Households	Vacant Units				Under Construction
		Used and New		Used	New	
		Number	Per Cent			
1967: 2/27-3/1	1,896	64	3.4%	37	27	48
1969: 6/18-24	2,518	24	1.0	22	2	104
1970: 2/10	2,263	42	1.9	33	9	44
1971: 7/31	2,212	12	0.5	6	6	54
1973: 2/20-21	2,722	13	0.5	12	1	56
1974: 4/8	2,849	8	0.3	3	5	95

<sup>1</sup>Kapaa and Lihue only.

Source: U.S. Department of Housing and Urban Development, Federal Housing Administration.

The housing turnover rate on Kauai has also been low in comparison with the rest of Hawaii. The Hawaii Health Surveillance Program conducted a survey in 1972, which found that the annual housing turnover rate on Kauai was 9.6%, less than half the rate for civilian housing in the State as a whole.

d. Results of Housing Study by Mayor's Office

The Kauai Mayor's Office conducted a housing survey throughout the Island in September, 1973. The results for the Koloa-Poipu area are summarized below. The surveyers found that virtually

<sup>1</sup>The Hawaii Health Surveillance Program Survey, which is based on a random sample of housing units, found that the vacancy rates on Kauai by quarter in 1974 were as follows: 2.7%, 4.4%, 4.3%, and 1.5%.

all of the housing (97%) in the area is the single-family dwelling unit type. Owner-occupied and rental units are split almost equally. The vacancy rate was 7.7%. There were approximately three persons per dwelling unit at the time of the survey.

---

	<u>Koloa-Poipu</u> <u>(Percentage Distribution)</u>
<b>Present Housing Condition (as assessed by occupants);</b>	
Good	46%
Fair	30
Poor	18
Unsafe	6
<b>Housing Types:</b>	
Single-Family	97%
Multi-Family	3
<b>Family Size (number of persons):</b>	
1-2	41%
3-4	33
5 or more	26
<b>Age Characteristics:</b>	
0- 5	15%
6-11	20
16-21	9
22-44	28
45-61	15
62 and over	13

---

e. Housing Sales on Kauai

The tables below present housing sales data for Kauai, based upon listings and sales under the Multiple Listing Service (MLS). The level of sales activity was very high in 1973, but has been very low in 1974 and 1975. There are indications, however, that the market is improving in the second half of 1975.

TABLE III-5  
DOLLAR VOLUME OF MLS SALES, 1972-1975<sup>1</sup>  
(\$000)

<u>Year</u>	<u>January-June</u>	<u>July-December</u>
1972	\$ 170	\$ 514
1973	1,009	1,303
1974	173	579
1975	409	--

<sup>1</sup>Multiple Lising Service, 1975 Statistical Review, Six Months Ending June 30th, Honolulu Board of Realtors and Data Communications, Inc.

The total amount of sales in Kauai County from 1970 to 1974 is shown below. These figures include leases, agreement of sales assignments, subleases, and deeds, all of which are recorded by the State Bureau of Conveyances.

TABLE III-6  
TOTAL SALES IN KAUAI COUNTY, 1970-1974

<u>Year</u>	<u>Land Sales and Transfers<sup>1</sup></u>
1970	\$24,522,136
1971	28,246,710
1972	80,273,873
1973	85,687,288
1974	65,517,568

<sup>1</sup>Hawaii State Department of Land and Natural Resources, Bureau of Conveyances records.

The average sales price for single-family homes under the MLS has doubled from \$36,000 in 1972 to \$70,000, as shown in the table below.

TABLE III-7

AVERAGE SALES PRICE FOR MLS SINGLE-FAMILY RESIDENTIAL SALES,  
1972-1975

<u>Year</u>	<u>January-June</u>	<u>July-December</u>
1972	\$36,250	\$27,750
1973	83,580	41,000
1974	--	63,000
1975	70,000	--

Land Sales on Kauai

Table III-8 represents a summary of land sales data for the Island of Kauai during the past five years. These data are for "bulk" sales of sizable parcels rather than individual lots. Rather than simply examining sales price on a per square foot basis, we have compared the bulk sales in several respects. It is clear that the important variables are location, date of sale, land area involved in the sale, zoning classification, status of utilities and improvements, and land value per allowed residential unit.

The sales amount per residential unit ranged from approximately \$3,300 to \$5,900 (excluding the areas close to resorts). Values per square foot for R-20 zoned land ranged from \$0.96 to \$3.50, and from \$1.30 to \$2.30 per square foot for R-10 zoned land.

Improved Lot Sales on Kauai

Table III-9 summarizes sales data for individual improved lots. The locations examined included two sites in the Kalaheo/Kukuioolono area, one at Poipu, once at Princeville, and one in Lihue.

TABLE III-8  
LAND SALES ON KAUAI

Location	Date of Sale	Land Area	Zone	Utilities and Improvements	Land Value	
					Per Sq.Ft.	Per Residential Unit
Lihue	1972	32.918 acres	R-6	a) Overhead lines to site b) Water main available c) On waiting list for sewer hookup	\$0.43	\$ 3,844
Nawiliwili	1974	13.755 acres	R-20	a) Overhead lines to site b) 8-inch water main (proposed) c) No sewer hookup available d) Steeply sloping site	0.96	3,784
Lihue (Lihue Townhouse)	1970	70,197 sq.ft.	R-20	a) Overhead lines to site b) Water main available c) Sewer available	3.00	3,280
Lihue	1973	140,584 sq.ft.	R-20	a) Overhead lines to site b) No sewer service	3.50	5,125
Lihue (Kalapaki)	1973	15.303 acres	R-20	a) Overhead lines to site b) No water service c) No sewer service	2.70	5,882
Kapaa	1973	6.71 acres	R-10	a) Overhead lines to site b) Water available c) No sewer service	2.30	10,000 <sup>1</sup>
Lihue	1973	143,356 sq.ft.	R-10	a) Overhead lines to site b) Water available c) Sewer hookup available	1.30	5,813

<sup>1</sup> Close to resort area.

TABLE III-9

IMPROVED LOT SALES DATA FOR KAUAI

<u>Project</u>	<u>Location</u>	<u>Total Lots</u>	<u>Lot Sizes</u>	<u>Fee/Lease</u>	<u>Improvements</u>	<u>Comments</u>
Palama	Kukuioiono/ Kalaheo	10	11,452- 22,733 sq.ft.	--	U/G Utilities Site work completed	Protective covenants Mountain views
Kalaheo Hillside	Kukuioiono/ Kalaheo	29	11,000 sq.ft.	Fee	U/G Utilities Site work underway	Ocean view \$2.50-\$3.00/s.f.
Poipu	Poipu Crater	20+	10,000 average	Fee	U/G Utilities Site work completed	\$5-\$6 p.s.f.; 3 per month absorption maximum; sold originally 5 years ago
Princeville	Princeville at Hanalei	216	9,000- 16,558 sq.ft.	Fee	U/G Utilities Site work underway	78 of 216 front on golf course; protective covenants; \$2-\$4 p.s.f.; \$18,125-\$42,500 per lot
Lihue Town Estates	Lihue	101	6,000+ sq.ft.	Fee	U/G Utilities Site work completed	Two houses under construction Fifty units will be built by H.H.A.

Most lots are sold in fee simple and the average parcel size is 10,000 to 12,000 square feet. All of these developments were sold with underground utilities and with site work underway or completed. Several of the developments imposed protective covenants to ensure adherence to architectural quality standards. The developers do not, however, impose a time limit during which construction must commence or be completed.

Per square foot sales range from \$2.00 to \$4.00 at Princeville and Kalaheo to \$5.00 or \$6.00 per ocean view property close to the beach at Poipu.

#### Market Absorption Rates on Kauai

##### a. Condominiums

A number of projects on Kauai were examined to determine current and historical market absorption rates. Most of the developments which have been marketed in the past experienced an initial surge when units were first placed on the market. This was particularly true for those units sold prior to 1973. The initial increment of Pali Ke Kua, for example, sold two-thirds of the units when sales officially commenced. This successful effort actually represented about three months of unofficial pre-sales prior to the check drawing. Following this initial surge, the project sold out rather quickly, for an overall absorption rate of 10-12 units per month.

This pattern was fairly representative of many condominium projects on Kauai until the market slumped in 1973 and 1974. In recent months, there has been virtually no sales activity at Princeville. Several developers have experienced severe financial difficulties.

There are indications, however, that the market is improving in 1975. It is also clear that, while condominium sales at Princeville have been very slow, the same realtors who are involved at Princeville have been successful in marketing units on the opposite side of the Island at Poipu.

b. Koloa-Poipu Market

It is clear that this differentiation between Princeville and Poipu is not simply a transitory phenomenon. In the course of the market analysis, a number of developers and realtors were interviewed. Virtually all of them felt that Koloa-Poipu is a well-differentiated market and is separate from and -- from a market point of view -- superior to, the rest of Kauai. It is very accessible to visitors, has excellent beaches, a picturesque shoreline, and, above all, a very good climate with relatively little rainfall.

c. Kiahuna Market Absorption Rates

It also should be noted that Kiahuna is both a new development and quite different from the usual condominium project on Kauai. There are really no adequate market "comparables" which can be used to project sales rates at the proposed Moana project. Hence, the best indicator for future absorption rates at the Moana Project is the past performance of Kiahuna and, to some extent, other new developments in the Koloa-Poipu area.

Units at Kiahuna and Kuhio Shores sold at a steady, brisk pace in 1974, which is generally regarded as the worst year for real estate on Kauai in the recent past. Kuhio Shores has been selling at a rate of approximately seven units per month throughout 1975. Kiahuna at Poipu has succeeded in selling ten units per month during a period of economic downturn which has created a generally weak market. This absorption rate was achieved without any significant advertising campaign.

Accordingly, it is assumed that the proposed Moana Project can sell at least 100 condominium units per year.<sup>1</sup> While water frontage will be lacking, it appears that the combination of good climate, an 18-hole golf course, and complete recreational facilities will be sufficient to offset the lack of oceanfront units.

d. Lot Sales

In the past, lot sales have been an important part of Kauai's development. Lot sales have been popular because individuals are allowed to build their own homes, as finances permit, at a considerable savings over retail prices.

As noted earlier, lot prices on Kauai range from \$2.00 to \$6.00 per square foot for improved parcels with underground utilities. Absorption rates also vary widely, depending upon location. In the Poipu area, lots have recently been sold at a rate of three per month in relatively small developments.

e. Moana Project Lot Sales Absorption

It is probable that the lots in the proposed Moana development can be sold at an average rate of two to three parcels per month. Given the price structure, however, it is likely that the less expensive lots will be sold out very quickly in the initial surge. The lots at the upper end of the price schedule may sell at a slower rate. Based on an analysis of comparables, they can be successfully marketed, however, because they will be strategically situated at key points around the golf course.

---

<sup>1</sup>It is assumed that the proposed Moana Project will consist of an equal mix of one- and two-bedroom units. Sales prices are projected in a range from \$40,000 to \$80,000, with an average of approximately \$60,000.

The following is the projected price schedule for lots:

<u>Individual Lot Sales Prices</u>	<u>Number of Lots</u>	<u>Total Sales Volume</u>
\$ 5,000	30	\$ 150,000
7,500	30	225,000
10,000	80	800,000
15,000	60	900,000
20,000	60	1,200,000
30,000	30	900,000
40,000	10	400,000

Projected Buyer Profile

a. Condominiums

It is anticipated that the buyers of condominium units in the proposed Moana Project will be from the same general group as those who purchased units in the initial increments at Kiahuna. The only change may be that the new buyers will represent a broader range of incomes, in that the new Moana units may be priced somewhat lower than those in the initial development increment.

Sales at Kiahuna have been primarily to Mainland residents, principally from California. Unit purchasers tend to be relatively high income people who have been attracted to Kiahuna by the unit design, project layout, recreational amenities, and the warm, sunny climate. A key factor also has been Kauai's generally quiet environment, and the visitors' desire to experience a Hawaiian vacation while avoiding a Waikiki-like environment. Many visitors are tennis enthusiasts. It is anticipated that, in the proposed new Moana development, a significant percentage of the purchasers will be golfers as well as tennis players.

b. Lot Buyers

It is expected that purchasers of lots will be divided approximately equally between Hawaii residents and Mainland visitors. Perhaps 25-30% of the lots will be sold to Kauai residents who wish to live in the Poipu area and are attracted to the golf course. Another 20-25% may be sold to residents of other areas in the State of Hawaii; many of these will be retirees or middle-aged people anticipating retirement. The remainder of the lots will be sold to Mainland people who wish to build a second home or a retirement house.

Housing Requirements

In order to forecast future housing requirements, it was necessary to examine current population trends, vacancy, and turnover rates, replacements or demolitions. We have found that the population is expected to grow at a relatively slow, steady rate from approximately 31,000 in 1975 to 34,000 in 1980 and 37,337 in 1985. The market analysis also revealed that the vacancy and turnover rates on Kauai are very low, that demolitions number less than 100 per year, and that the typical household has slightly over three persons. It also is clear that a significant percentage of the population is in the younger age brackets, which means that household formations and demand for new housing units will remain high in the foreseeable future.

The last item to be analyzed is the historical trend in housing replacements. As noted earlier, the permits issued for new housing have followed this pattern:

<u>Year</u>	<u>Single-Family Permits</u>	<u>Multi-Family Permits</u>
1970	302 Units	91 Units
1971	348	94
1972	522	367
1973	426	347
1974	396	302

Thus, the average number of single-family units authorized by building permit (and assumed to have been built) was 399 per year over the past five years; the annual average for multi-family units was 240; and the average annual number of housing units demolished was 83. The net addition to the housing stock, then, has been 556 units per year since the beginning of 1970.

It is assumed that this trend will continue in the future. We have assumed an annual net addition to the housing stock on Kauai of 500 units, comprised of 50% single family and 50% multi-family units. This total production figure is intended to accommodate new households, replace demolished houses, and allow for a minimal vacancy rate to be maintained.

During the first fifteen years of its buildout schedule, the proposed Moana project would provide twenty lots annually, or 8%, of the projected annual demand on Kauai for single-family lots and dwellings and 75 units, or 30%, of the projected annual demand for multi-family units occupied by Kauai residents.

a. Ability to Pay for Housing

Table III-10 presents a summary of household income and home buying ability of Kauai residents, based upon 1974 data. The top portion of the table shows the distribution of households by income categories. This indicates that 15% earn less than

TABLE III-10

HOUSEHOLD INCOMES AND HOME BUYING ABILITY OF KAUAI RESIDENTS

<u>Household Income</u>	<u>Percentage Distribution<sup>1</sup></u>	<u>Number of Households<sup>1</sup></u>
\$ 0- 4,999	15.2%	1,300
\$ 5,000- 6,999	11.4	975
\$ 7,000- 8,999	14.9	1,274
\$ 9,000-11,999	12.5	1,069
\$12,000-13,999	9.3	795
\$14,000-19,999	20.1	1,719
\$20,000-24,999	8.1	693
\$25,000+	8.6	735

<u>Household Income</u>		<u>Maximum Monthly Housing Expenditure</u>	<u>Maximum Affordable Sales Price<sup>2</sup></u>
<u>Annual</u>	<u>Monthly</u>		
\$ 0- 4,999	\$ 0- 416	\$ 0-104	\$ 0-12,000
\$ 5,000- 6,999	\$ 417- 582	\$105-146	\$12,000-17,000
\$ 7,000- 8,999	\$ 583- 749	\$147-187	\$17,000-21,000
\$ 9,000-11,999	\$ 750- 999	\$188-249	\$21,000-29,000
\$12,000-13,999	\$1,000-1,166	\$250-291	\$29,000-33,000
\$14,000-19,999	\$1,167-1,666	\$292-416	\$33,000-48,000
\$20,000-24,999	\$1,667-2,082	\$417-521	\$48,000-61,000
\$25,000+	\$2,083+	\$521+	\$61,000+

<sup>1</sup>Based upon 1974 data compiled by the University of Hawaii in the Kauai Socioeconomic Profile.

<sup>2</sup>Assumes 10% downpayment, thirty-year mortgage with interest at 9 3/4% (including mortgage and fire insurance), plus approximately 10% of the monthly housing expenditure allocated for real property taxes and special assessments.

\$5,000 annually; approximately 27% earn less than \$7,000; 41% gross less than \$9,000 per year; and 54% earn less than \$12,000 annually. Only 16.7% of the households gross \$20,000 or more per year.

The bottom portion of the table translates to maximum monthly housing expenditures. It is generally accepted that no more than 25% of a household's gross income should be allocated to expenditures on housing (for either ownership payments or for rental). Ownership payments include principal and interest on the mortgage, mortgage insurance premiums, lease rental payments, real property taxes, fire insurance premiums, and, in some cases, special assessments for such items as sewer improvements.

The 25% standard results in the column shown as "maximum monthly housing expenditure." This in turn is converted into the "maximum affordable sales price" by employing a number of generally accepted financing guidelines and assumptions.

It was assumed that the buyers would qualify for conventional financing based upon monthly payments approximating 25% of gross income. Ninety per cent financing for primary home ownership was assumed over a thirty-year life at an interest rate of 9 3/4%. It also was assumed that approximately 10% of the monthly housing expenditure would be allocated to escrow payments for real property taxes, insurance, and assessments.

This table may be used for fee simple or leasehold property. It is apparent, however, that a purchaser can usually buy a better house at leasehold than for the same amount on a fee simple basis. That is, most of the purchase price on a leasehold basis is allocated to the house, whereas a fee simple price includes a significant allocation to the land.

The sales prices derived by employing this methodology are shown in the last column. This indicates that 16.7% of Kauai's households can afford homes priced at \$48,000 or higher. Approximately 36.8% can afford houses selling for \$33,000 or more. At the moment, there are virtually no homes selling for less than \$33,000 on a fee simple basis.<sup>1</sup>

b. Moana Project Lots Sales Relative to Kauai Residents' Ability to Pay

Utilizing the same income statistics for Kauai residents as were used above in Table III-10, we have projected the ability of Kauai residents to pay relative to Moana Project lot sales prices. The same financing assumptions are employed here; that is, 90% financing over 30 years at 9 3/4% interest with 10% of the monthly housing expenditure allocated for real property taxes and special assessments. An average annual ground lease rent figure of \$100 is added. A rather low construction cost factor has been utilized on the basis that owners will provide much of the labor for construction finishing and landscaping. This assumption is reasonable inasmuch as it is customary on Kauai for the owner and family or friends to provide a significant portion of the necessary labor. The resulting calculations can be seen in Table III-11.

These estimates indicate that approximately 40% of the households on Kauai, assuming 1974 income levels, can afford the lowest priced lots in the Moana Project. Assuming a total population of 32,000 in 1977 (when lots are sold) and approximately 8,900 households, this means that the lowest priced lots would be affordable for 3,560 households.

---

<sup>1</sup>It should be noted that it is virtually impossible to provide new housing on Kauai at \$33,000 or below. Even the public sector housing agencies encounter difficulty in this area. At Weliweli, for example, fee simple houses built by HHA in 1974 sold at approximately \$42,000.

TABLE III-11

MOANA PROJECT LOT SALES PRICES RELATIVE TO KAUAI RESIDENTS' ABILITY TO PAY

Moana Project Lot Prices	Construction		Total Cost	Amount to be Financed	Monthly Mortgage	Taxes and Assessments	Monthly Lease Rate	Total Monthly Cost	Necessary Income Level	Number of Qualifying Kauai Households
	Cost	Cost								
\$ 5,000	\$25,000		\$30,000	\$27,000	\$232	\$23	\$8	\$263	\$12,624	3,560
7,500	27,500		35,000	31,500	270	27	8	305	14,640	3,293
10,000	30,000		40,000	36,000	309	31	8	348	16,704	2,225
15,000	35,000		50,000	45,000	387	39	8	434	20,832	1,424

The \$7,500 lots, assuming housing construction costs of \$27,500, could be purchased by 35% of the residents, or 3,115 households. Similarly, the \$10,000 lots are within the means of approximately 25% of the residents, or 2,225 households. The \$15,000 lots, assuming construction costs of \$35,000, can be afforded by approximately 16% or 1,424 households.

#### THE HOTEL-CONDOMINIUM VISITOR MARKETS IN HAWAII

The success of the proposed Moana Project is partially dependent upon the future strength of the Hawaii visitor, hotel, and condominium markets. In this section, we have summarized and examined those market data and trends which are considered relevant to the proposed Moana Project.

##### Visitor Trends in Hawaii

Tourism has grown very rapidly in Hawaii since statehood more than sixteen years ago. This trend is attributable to lower air fares, faster aircraft, new direct air routes to key Mainland cities, as well as relaxed travel restrictions for citizens of Japan.

##### a. Overnight Visitors and Visitor Expenditures

Table III-12 indicates that more than 2.7 million overnight visitors came to Hawaii in 1974. It is estimated that these tourists spent more than \$1 billion during their stay in the State.

##### b. Monthly Visitor Statistics

Table III-13 represents a summary of monthly visitor trends for the State of Hawaii. This table shows that the flow of visitors is now fairly constant, and that problems with sharp seasonal fluctuations have been largely alleviated.

TABLE III-12

## OVERNIGHT VISITORS TO HAWAII BY MONTHS, 1970 TO 1974

<u>Month</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
January	117,826	114,664	159,097	191,633	221,288
February	122,587	126,728	181,424	214,287	226,877
March	148,080	136,303	200,138	219,622	251,276
April	124,724	144,223	167,506	207,010	217,627
May	130,692	144,413	161,168	196,762	205,411
June	180,249	164,554	194,436	238,079	256,264
July	188,068	178,860	223,653	250,797	249,168
August	204,505	199,774	232,626	280,773	298,695
September	124,987	125,617	160,171	199,968	198,021
October	138,150	168,966	189,169	220,001	225,100
November	113,790	140,357	173,384	195,174	210,458
December	153,312	174,485	201,605	216,846	226,304
Total	1,746,970	1,818,944	2,244,377	2,630,952	2,786,489

Source: Hawaii Visitors Bureau Basic Data Survey.

TABLE III-13

VISITORS TO THE STATE OF HAWAII AND  
 VISITOR EXPENDITURES: 1974 TO 1974  
 (Visitors Staying Overnight or Longer)

<u>Year</u>	<u>Both Directions</u>	<u>Westbound<sup>1</sup></u>	<u>Eastbound<sup>2</sup></u>	<u>Visitor Expenditures in Hawaii</u>
1964	563,925	460,290	103,635	\$ 205,000,000
1965	686,928	567,218	119,710	225,000,000
1966	835,456	686,886	148,570	280,000,000
1967	1,124,818	893,103	231,715	380,000,000
1968	1,314,571	1,015,844	298,727	440,000,000
1969	1,527,012	1,818,029	345,983	525,000,000
1970	1,746,970 <sup>3</sup>	1,326,135 <sup>3</sup>	420,835	550,000,000 <sup>3</sup>
1971	1,818,944	1,430,325	388,619	645,000,000
1972	2,244,377	1,782,737	461,640	755,000,000
1973	2,630,952	2,067,861	563,091	890,000,000
1974	2,786,489	2,184,620	601,869	1,070,000,000

<sup>1</sup>Arriving from North America.

<sup>2</sup>Arriving from Asia or Oceania.

<sup>3</sup>Readjusted - September, 1974.

<sup>4</sup>Expenditure data for 1974 are based on 1974 Visitor Expenditure Survey.

Note: All expenditure figures are in current dollars.

Source: Annual Research Reports and Revised Visitor Statistics, 1964-1974, Hawaii Visitors Bureau.

c. Sources of Visitors

Table III-14, "Sources of Visitors," describes the percentage distribution of westbound travelers to Hawaii by origin. This summary demonstrates that nine-tenths of the westbound visitors came from the United States, one-third are from the Pacific Coast states, and approximately one-quarter of the total are from California. This table also shows the trends from 1964 to 1974: The State of Hawaii receives visitors from all areas of the United States and is now less dependent upon western states than was the case ten years ago.

TABLE III-14

SOURCES OF VISITORS

(Percentage Distribution of Westbound Travelers to Hawaii in 1964, 1973, 1974)

<u>Sources of Westbound Visitors</u>	<u>1964</u>	<u>1973</u>	<u>1974</u>
United States	93.6%	91.6%	90.2%
Pacific Coast	52.7	34.3	33.3
California	44.6	25.5	24.4
Mountain	5.5	5.1	4.9
West North Central	4.6	5.9	6.8
West South Central	3.1	5.3	5.1
East North Central	11.8	16.1	16.5
East South Central	1.0	2.0	2.1
New England	2.7	4.0	3.4
Mid-Atlantic	8.5	12.7	11.9
South Atlantic	3.7	6.2	6.2
Canada	5.9	7.7	8.9

Source: Hawaii Visitors Bureau Annual Research Reports.

d. Visitor Days and Visitor Census

Table III-15 includes estimates of visitor days and average visitor census in the State of Hawaii during the period 1970 to 1974. This indicates that there were approximately 23 million visitor days spent in the State in 1974, based upon an average length of stay of approximately 10 days. The average daily visitor census in 1974 was approximately 63,000.

TABLE III-15

ESTIMATES OF VISITOR DAYS AND AVERAGE DAILY VISITOR CENSUS BY DIRECTION OF TRAVEL, 1970 TO 1974

Year	Visitor Days			Average Daily Visitor Census		
	Total	Westbound	Other <sup>1</sup>	Total	Westbound	Other <sup>1</sup>
1970	13,464,143	11,669,988	1,794,155	36,888	31,973	4,915
1971	14,902,528	13,302,023	1,600,505	40,829	36,444	4,385
1972	18,426,014	16,579,454	1,846,560	50,344	45,299	5,045
1973	21,690,257	19,437,893	2,252,364	59,425	53,254	6,171
1974	23,161,366	20,753,890	2,407,476	63,456	56,860	6,596

<sup>1</sup>Eastbound and northbound. These estimates are approximations, based on an average stay of five days for R&R personnel and four days for other eastbound or northbound visitors.

Source: Estimates based on Hawaii Visitors Bureau Basic Data Survey.

e. Traveler Status

The overnight visitors to the State of Hawaii are comprised of an almost equal mix of groups and "free and independent travelers" (F.I.T.); the following is a general categorization for visitors in 1974:

Organized Tour Groups	47.2%
Individual Basis	52.3%
Other (Government and Military)	0.5%

f. Age Distribution

Most of Hawaii's visitors are middle-aged, as shown in the following table:

TABLE III-16

AGE DISTRIBUTION OF WESTBOUND TRAVELERS TO HAWAII IN 1974

<u>Age Group</u>	<u>Percentage Distribution</u>
Under 10 Years	2.5%
10-19 Years	7.4
20-29 Years	16.8
30-39 Years	15.0
40-49 Years	20.4
50-59 Years	22.5
60 Years and Over	15.4

Source: Hawaii Visitors Bureau Annual Research Reports.

Visitor Trends on Kauai

In recent years, approximately one-third of the State's visitors have been stopping off on Kauai for a few days. As a result, the economic impact of tourism has been substantial.

a. Annual Visitors

As the following figures indicate, the flow of visitors to Kauai has increased steadily in the past decade.

<u>Year</u>	<u>Westbound Visitors</u>
1964	133,960
1966	175,820
1968	327,813
1970	426,030
1972	565,385
1974	601,703

b. Length of Stay

While the average length of stay in the State has remained at approximately ten days, the average length of stay for west-bound visitors to Kauai has varied between 2.60 and 2.74 days, as shown below.

<u>Year</u>	<u>Average Length of Stay (Days)</u>
1970	2.68
1971	2.74
1972	2.68
1973	2.60
1974	2.73

Source: Hawaii Visitors Bureau and Kauai County Economic Report.

It should be noted that the average length of stay by eastbound (mostly Japanese) visitors is much shorter. Many Japanese groups visit Kauai for only one day.

c. Hotel Inventory and Occupancy Rates

In general, the development of visitor plant facilities has kept pace with visitor flow to Kauai. This trend is demonstrated in the table below, which shows hotel room inventory and occupancy rates for Kauai from 1970 to 1975.

<u>Year</u>	<u>Hotel Rooms</u>	<u>Percentage Changes in Hotel Rooms</u>	<u>Annual Occupancy Rate</u>
1970	2,609	--	58.0%
1971	2,699	3.4%	60.1
1972	2,629	-2.6	67.5
1973	2,926	9.1	75.9
1974	3,073	7.1	78.0
1975	3,102	0.9	77-78.0 <sup>1</sup>

<sup>1</sup>Approximate occupancy for the first eight months of 1974.

Source: Hawaii Visitors Bureau and Kauai County Economic Report.

Table III-17 indicates the monthly occupancy rates in 1974 for Poipu compared to the average for Kauai and for the Neighbor Islands in general. This demonstrates that the overall 1974 average in Poipu was 80.7% and that Poipu generally has a higher occupancy rate than the Island as a whole. The average occupancy dipped below 75% in only two months, November and December.

TABLE III-17

HOTEL OCCUPANCY RATES ON KAUAI, 1974

<u>Month</u>	<u>Poipu</u>	<u>Monthly Ranking for Poipu</u>	<u>Kauai Total</u>	<u>Neighbor Island Average</u>
January	75.9%	9	63.6%	65.1%
February	94.8	1	84.9	81.8
March	93.0	2	86.6	80.6
April	86.3	4	78.2	67.9
May	77.6	7	78.9	66.1
June	77.4	8	79.3	66.3
July	84.4	5	85.1	73.0
August	90.5	3	92.7	80.8
September	75.6	10	74.1	60.6
October	83.5	6	83.6	71.4
November	74.4	11	72.5	64.2
December	61.7	12	56.4	55.0
Total, 1974	80.7		78.1	69.4

Source: Hawaii Visitors Bureau Annual Research Report, 1974.

d. Location of Visitor Plant Inventory

Table III-18 indicates the location of existing and planned visitor room inventory on Kauai, as reported by the Hawaii Visitors Bureau.

TABLE III-18

KAUAI VISITOR ROOM INVENTORY,  
BY LOCATION - EXISTING AND PLANNED

<u>Area</u>	<u>Existing Units</u>	<u>1975</u>	<u>1976</u>	<u>Indefinite</u>
Lihue	605	170	--	--
Wailua-Kapaa	1,586	--	--	645
Hanalei-Haena	322	395	450	410
Poipu	557	150	--	350
Kalaheo	20	--	--	--
Kokee	12	--	--	--
Total	3,102	715	450	1,405

Source: Hawaii Visitors Bureau and Annual Research Reports.

Hence, it should be noted that, although our research and interviews indicate that the Poipu area has the greatest destination resort appeal of any area on the Island, its tourism accommodation capacity is relatively low.

e. Poipu Area Visitor Plant

The following figures include a unit breakdown for the various hotel and condominium units in the area from Poipu Beach to Lawaii.

<u>Hotels</u>	<u>Rooms</u>
Sheraton	168
Waiohai	51
Poipu Beach	141
	<u>360</u>
<u>Condominiums</u>	<u>Units</u>
Sunset Kahili	26
Prince Kuhio	99
Poipu Shores	28
Kiahuna I and II	200
Kuhio Shores	75
Garden Isle	16
	<u>445</u>
<u>Combined Total</u>	<u>805</u>

It should be noted that other hotels and condominiums are being planned for Koloa-Poipu. These have not been included in this analysis because it is impossible to determine which projects actually will be built. Among the possible future developments are a 200-room addition to the Sheraton-Kauai, a hotel consisting of as many as 430 rooms on Amfac's property between the Waiohai and the Poipu Beach Hotel, a new 150-unit condominium adjacent to the Prince Kuhio, a 13-unit addition at Poipu Shores, and a condominium development on the Leadership Homes tract near Poipu.

f. Impact of Moana Project Visitor Population

Table III-19 presents an estimate of the impact of the proposed Moana Project's visitor population. Using conservative estimates of visitor growth (which tends to overstate the potential impact of the Moana Project), we have calculated projected visitor totals for Kauai and an average daily visitor census from now until 1995. The final column shows that the projected Moana Project non-resident population represents 2.15% of the Kauai visitor population.

TABLE III-19  
ESTIMATES OF THE IMPACT OF MOANA PROJECT VISITOR POPULATION

Year	Visitor Projections to the State of Hawaii (000)	Kauai Market Share <sup>2</sup>	Average Length of Stay on Kauai <sup>2</sup>	Average Daily Visitor Census <sup>3</sup>	Moana Non-Resident Population as % of Visitor Census
1974	2,786	27.5%	2.73 days	5,730	--
1976	2,786	27.5	2.73	5,730	--
1978	3,013	27.5	2.70	6,129	2.15%
1980	3,259	27.5	2.70	6,630	5.70
1982	3,457	27.5	2.70	7,032	8.87
1985	3,778	27.5	2.70	7,685	12.92
1990	4,379	27.5	2.70	8,907	18.05
1995	5,077	27.5	2.70	10,327	17.95

<sup>1</sup> Assumes no significant change in total visitors between 1974 and 1976. Between 1976 and 1980, an annual compound growth rate of 4% is assumed. After 1980, a 3% annual growth factor is utilized.

<sup>2</sup> Assumes no significant change in Kauai's market share (that is, Kauai visitors as a percentage of total overnight visitors to the State) or in average length of stay on Kauai.

<sup>3</sup>  $2,786 \times 27.5\% \times 2.73 \text{ days} = \text{total visitor days divided by } 365 = \text{daily census.}$

## THE HAWAII CONDOMINIUM MARKET

Over 15 years ago, the U.S. Congress authorized the Federal Housing Administration (FHA) to insure condominiums. Shortly thereafter, Hawaii became the first state to adopt a condominium law (1961). The next year, legislation was passed in Hawaii which allowed condominium owners to become eligible for home exemptions from property taxes. This law provided the impetus for widespread condominium development.

### Description of Condominium Projects on Kauai

In 1974, there were more than 4,500 condominium units operating (or under construction) on the Neighbor Islands. Most of these were, as noted above, of the second-home/resort type. We have examined several of the projects on Kauai which are considered to be competitive with Kiahuna.

### Analysis of Market Comparables

We have examined a number of condominium projects on Kauai to ascertain the characteristics of developments which are comparable in certain respects to Kiahuna. We are comparing these projects to the present Kiahuna project because Kiahuna is indicative of the quality, size, and cost/price structure of the units in the proposed Moana Project. "Comparable" is loosely defined as condominium projects now selling on Kauai in roughly the same price range or to the same market as Kiahuna. In practice, this category includes most of the available condominiums on Kauai.

The condominium projects we have analyzed will be described in terms of unit mix, unit sizes, and sales prices per square foot. These are generally acknowledged to be among the most important

market characteristics of condominiums and are commonly used for comparison purposes. We shall also note, in passing, the types of amenities which are offered with these condominiums.

Unit Size Summary for Kauai Condominiums

Table III-20 summarizes the unit sizes of selected Kauai condominiums. This table indicates that the average net living area for one-bedroom/one bath units is 705 square feet. Two-bedroom units average 1,116 square feet. Units at Kiahuna are large by comparison; one-bedroom units are 750 square feet and two-bedroom units are 1,450 square feet.

TABLE III-20  
UNIT SIZE FOR KAUAI CONDOMINIUMS

Project	Location	Total Units	Unit Net Living Area in Sq.Ft. By Type of Unit (Bedroom/Bath) <sup>1</sup>			
			1/1	1/1½	2/1½	3/2
Princeville Sealodge	Princeville	149	564-633		809- 812	
Princeville Mauna Kai	Princeville	129			1,280	1,478
Pali Ke Kua	Princeville	191	717	904	1,127	
Alii Kai	Princeville				951-1,319	
Hanalei Colony Resort	Hanalei	52			774- 850	
Wailua Bay Apartments	Wailua	45	686			
Plantation Hale	Wailua	160	584			
Sunset Kahili	Poipu	36	766-778		1,028	
Hanalei Bay Villas	Princeville	37			960-1,248	
Kiahuna I	Poipu	29	750		1,450	
Kiahuna II	Poipu	172	750		1,450	
Kuhio Shores (Kolopa)	Koloa	75	732-830		953- 990	

<sup>1</sup>Net living area does not include lanais.

Source: Onsite surveys; Hawaii Condominium Guide.

Sales Data Per Square Foot

Table III-21 presents "Sales Data Per Square Foot for Selected Kauai Condominiums." This information is based upon net area and, therefore, does not include lanais. This summary reveals that the average sales price per square foot for Kauai condominiums was \$71 for one-bedroom units and \$73 for two-bedroom. The sales prices at Kiahuna, by comparison, have averaged approximately \$101 per square foot for one-bedroom units and \$67 per square foot for two-bedroom units.

TABLE III-21

SALES DATA PER SQUARE FOOT FOR SELECTED KAUAI CONDOMINIUMS  
(Based on Net Living Area)

<u>Project</u> <sup>1</sup>	<u>Date of Sale</u>	<u>Unit Mix, Number of Bedrooms</u>		
		<u>One</u>	<u>Two</u>	<u>Three</u>
Princeville Sealodge I	1973	\$66-70	\$59-64	
Princeville Sealodge II	1973	85-90	67-78	
Princeville Mauna Kai	1973		40-42	\$40-42
Pali Ke Kua I	1972-73	50-52		
Pali Ke Kua II, III	1974	60-66	50-53	
Alii Kai	1974		63-72	
Hanalei Colony Resort	1973-74		47-52	
Wailua Bay Aparaments	1973-74	61-71		
Plantation Hale	1972	75		
Sunset Kahili	1973	64	53	
Hanalei Bay Villas	1974		48-53	
Kiahuna II	1975	101	67	
Kuhio Shores (Kolopa)	1975	78-86	86-99	

<sup>1</sup>The Princeville Sealodge, Alii Kai, and Kuhio Shores are fee simple properties; all other projects listed are leasehold.

Source: Onsite surveys, public documents, and appraisal data.

These sales prices are higher than many other developments on Kauai. It is clear, however, that the relatively high sales prices are a function of higher construction costs because of a clearly superior grade construction. The result is not only a high-quality development but also higher tax revenues to the County.

#### Condominium Amenities

Condominium amenities, particularly those external to the unit, are important in ensuring the success of Neighbor Island projects. It is apparent that the major selling point of the successful condominiums is location. The best projects have ready access to the ocean, good swimming, a sunny climate, and protection from the wind. In addition, many of the quality projects are in close proximity to one or more resort hotels (as are the condominiums at Kaanapali on Maui, as well as the projects at Keauhou and Kailua-Kona on the Big Island). Lacking a resort hotel nearby, condominiums may compensate somewhat by offering ready access to activities such as golf, tennis, and fishing which are normally available at large resorts. Closeness to a quality restaurant and retail shops also is desirable for a prime condominium development. All of these amenities apply to Kiahuna and the proposed Moana Project.

Most good Neighbor Island resort condominiums also provide certain other facilities. These include a resident manager's quarters, a swimming pool, and perhaps a pavilion or recreation center or cabana. Finally, it is clear that the most marketable condominiums are attractively designed and the land is well-landscaped.

Sales Record for Kauai Condominiums in 1975

Table III-22 summarizes the sales record of all major Kauai condominiums on the multiple listing service during the first six months of 1975. This indicates that there were very few sales, most of the listed units remained unsold, the average duration on the market was over three months, and roughly 83% of all units which were sold experienced price cuts from the listed price.

This summary clearly demonstrates that the condominium market on Kauai has been very weak in 1975. This is generally the same situation which prevails throughout Hawaii and the country generally. It reflects the present state of the economy and an accompanying uneasiness among potential purchasers, rather than a loss of appeal of Kauai, or of recreation-oriented condominiums generally.

It is significant that the existing Kiahuna development sold very well in 1974-1975 despite these poor economic and market conditions. The Kiahuna performance can be attributed to (a) its superior quality compared to comparable priced units, and (b) the developer's cultivation of a financially sophisticated market segment on the Mainland consisting of relatively wealthy investors acquainted with the success of the company's Mainland projects. In view of this past performance, we believe that Moana Corporation should be able to sell 100 condominium units per year at the proposed development.

TABLE III-22

REAL ESTATE SALES DATA FOR KAUAI,  
FIRST SIX MONTHS, 1975

Listings and Sales by Type of Property

<u>Type of Property</u>	<u>Listed Price</u>	<u>Selling Price</u>	<u>Units Sold</u>	<u>Units Sold as a % of Units Listed</u>
Condominium (Investor-type)	\$350,000	\$339,000	6	35.3%

Condominium Sales Prices

<u>Price Range</u>	<u>Number of Sales</u>	<u>Average Number of Days on the Market</u>
\$30,000-49,999	3	138
50,000-69,999	1	72
70,000-89,999	2	48

Average Sales Price for MLS Condominium Sales

<u>Year</u>	<u>January-June</u>	<u>July-December</u>
1972	\$39,000	N.A.
1973	44,029	\$42,000
1974	N.A.	45,000
1975	55,560	

Price Cuts for Condominium Sales

<u>Price Cut</u>	<u>Number</u>	<u>Percentage Distribution</u>
0	1	16.7%
Under 5%	3	50.0
5-10%	1	16.7
10-15%	0	0
15-20%	1	16.7

Source: Multiple Listing Service, 1975 Statistical Review, Six Months Ending  
June 30th, Honolulu Board of Realtors and Data Communications Incorporated.

#### IV. PROJECT RELATED PUBLIC COSTS AND REVENUES

This section analyzes the major sources of revenue, for both the County of Kauai and the State of Hawaii, that will be affected as a result of the Moana Project, and estimates the increases in revenues which will result from the proposed project. We have also estimated the increased costs to the County and the State which likely will result from the project.

Based on these analyses, which are documented in the following materials, we estimate that the net cumulative revenues to the County (the amount by which revenues exceed costs) upon completion of the project will be approximately \$12,500,000. Cumulative revenue to the State is estimated at approximately \$5,400,000.

If the project is not built, the net revenue to the County from the subject property is estimated at \$453,000 over the same time period. Hence, the opportunity cost to the County if the project is not built (or if other projects with equivalent tax generating and public cost minimizing characteristics are not built) is estimated at approximately \$12,000,000 at the end of the period. ("Opportunity cost" equals net revenue less "no project alternative" net revenues.)

#### PUBLIC REVENUES

##### County of Kauai Public Revenues

The selected public revenue categories discussed here are those in which the amount of revenues accruing to the County as a result of the Moana Project are the most significant.

Revenue categories which were excluded from the analysis are assumed not to be affected or to be only marginally affected as a result of the Moana Project. For example, it was assumed that sanitation service charges obtained by Kauai County will not be affected by the Moana Project because of Moana Corporation's

development plans for a privately owned subregional sewage facility to handle the needs of the proposed project.

Table IV-1 shows that the largest sources of revenue for Kauai County are real property taxes and state grants-in-aid. Under Hawaii's centralized tax system, non-Federal taxes are State administered and collected. There are no personal property taxes, special levies such as those for school districts, municipal bonds, etc. The real property tax rates are set by the County of Kauai and vary according to the land use.

Table IV-2 indicates that over the period 1970-71 to 1975-76, largest percentage in major revenue sources occurred in taxes, revenues from investments and property, and other revenues which include revenue-sharing funds.

Table IV-3 is a statement of Kauai County's revenues for the next 6-year period, 1975-76 to 1980-81. Of the estimated increase in total county resources, real property taxes account for the majority of the additional projected revenues.

#### Real Property Taxes

According to Moana Corporation, the 300 single-family home lots are to be sold as improved residential lots with an estimated average market price of \$15,000. It is anticipated that the lots will average approximately 6,000 square feet and will have an annual lease rental of \$100 with a 77-year lease. The assessed land value is computed to be 70% of the market price, which comes to \$10,500. As homes are built by the individual owner on the single-family lots, it is estimated that the average market value of the buildings will be \$43,000 per residence; the assessed building value would be \$30,000. This is comparable to the Weliweli subdivision (Table IV-4).

The 1,150 multi-family units are estimated by Moana Corporation to have an annual average market price of \$60,000 per unit. The assessed value of each unit is estimated to be \$42,000. According

TABLE IV-1

## COUNTY OF KAUAI ESTIMATED REVENUE, 1975-76

Estimated Revenue by Source	1975-76 Estimated Revenue <sup>1</sup>	Per Cent of Total Revenue	1975-76 Per Capita Revenue <sup>2</sup>
<b>Taxes</b>			
Real property Taxes	\$ 6,308,950	46.58	\$203.51
Public Utility Franchise Tax	240,000	1.77	7.74
Fuel Tax	489,000	3.61	15.77
Total Taxes	\$ 7,037,950	51.96	\$227.02
<b>Licenses and Permits</b>			
Street Use	\$ 537,500	3.97	\$ 17.34
Business Licenses	115,750	0.85	3.73
Non-Business Licenses and Permits	101,550	0.75	3.28
Total Licenses and Permits	\$ 754,800	5.57	\$ 24.35
<b>Revenue from Investments and Property</b>			
Interest	\$ 620,000	4.58	\$ 20.00
Rents and Concessions	121,600	0.90	3.92
Total Revenue from Investments and Concessions	\$ 741,600	5.48	\$ 23.92
<b>Revenue from Other Agencies</b>			
State Grants-in-Aid	\$ 3,190,821	23.56	\$102.93
Other State Grants	8,325	0.06	0.27
Federal Grants, Civil Defense	38,882	0.29	1.25
Total Revenue from Other Agencies	\$ 3,238,028	23.91	\$104.45
<b>Charges for Current Services</b>			
General Government	\$ 11,100	0.08	0.36
Safety	32,000	0.24	1.03
Sanitation	120,100	0.89	3.87
Recreation	163,000	1.20	5.26
Others	350	0.00	0.01
Total Charges for Current Services	\$ 326,550	2.41	\$10.53
<b>Other Revenues</b>			
Revenue Sharing of \$968,688 less \$350,000 for CIP	\$ 618,688	4.57	\$19.96
Reimbursement for Fringe Costs and Others	53,000	0.39	1.71
Payment in Lieu of Taxes	16,300	0.12	0.53
Reimbursement of ERS, FICA, Health Fund and EIS from Waterworks	118,182	0.87	3.81
Reimbursement for Debt Service Charge on Waterworks Bonds	8,404	0.06	0.27
Total Other Revenue	\$ 814,574	6.01	\$26.28
<b>Total Revenue</b>	\$12,913,502	95.34	\$416.56
Unappropriated Surplus	600,000	4.43	19.35
Revenue Sharing	31,377	0.23	1.01
Contribution from General Fund for General Fund Expenses and Deficit	0	0.00	0.00
<b>TOTAL RESOURCES</b>	\$13,544,879	100.00%	\$436.92

<sup>1</sup>County of Kauai Operating Budget Ordinance, Ordinance No. B-12-75, Bill No. 319 (as amended), Fiscal Year July 1, 1975 to June 30, 1976.

<sup>2</sup>Per capita revenues were derived using 1975 estimated population figures from the Department of Planning and Economic Development, State of Hawaii, 1975.

TABLE IV-2

CHANGE IN COUNTY REVENUE, 1970 TO 1975-76  
(In Thousands of Dollars)

<u>Estimated Revenue</u>	<u>1970-71</u> <sup>1</sup>	<u>1975-76</u> <sup>2</sup>	<u>% Change</u>
Taxes	\$3,171	\$ 7,038	121.95
Licenses and Permits	553	755	36.53
Revenue from Investments and Property	67	742	1,007.46
Revenue from Other Agencies	3,175	3,238	1.98
Charges for Current Services	183	327	78.69
Other Revenues	<u>216</u>	<u>1,445</u>	568.98
Total Estimated Revenue	\$7,365	\$13,545	83.91%

<sup>1</sup>County of Kauai, Finance Director's Annual Report, 1971 (the revenue figures are actual costs for the fiscal year ended 1970-71).

<sup>2</sup>County of Kauai Operating Budget Ordinance, Ordinance No. B-12-75, Bill No. 319 (as amended), Fiscal Year July 1, 1975 to June 30, 1976.

TABLE IV-3

COUNTY OF KAUAI SIX-YEAR STATEMENT OF ESTIMATED REVENUE BY SOURCE  
AND FUND FOR FISCAL YEARS 1975-76 THROUGH 1980-81<sup>1</sup>

	1975- 1976	1976- 1977	1977- 1978	1978- 1979	1979- 1980	1980- 1981
Taxes						
Real Property Taxes	6,309	7,066	7,914	8,864	9,927	11,119
Public Utility Franchise Tax	240	260	275	280	290	300
Fuel Tax	489	497	504	512	519	527
Licenses and Permits						
Street Use	538	522	534	545	561	581
Business Licenses	116	118	124	131	136	141
Non-Business Licenses and Permits	102	106	108	113	123	133
Revenue from Investments and Property						
Interest on Certificates of Deposit	620	600	600	550	500	475
Rents and Concessions	122	149	150	150	160	160
Revenue from Other Agencies						
State Grants-in-Aid	3,191	3,191	3,191	3,191	3,191	3,191
Civil Defense Agency	39	40	41	42	43	44
Others	8	8	9	9	10	10
Charges for Current Services						
General Government	11	12	13	13	14	15
Safety	32	38	43	44	45	46
Sanitation	120	125	130	135	150	150
Recreation	163	164	166	169	174	179
Others	1	1	1	1	1	1
Other Revenue <sup>2</sup>						
Sundry	20	25	25	30	40	40
Reimbursement for Fringe Costs	33	35	38	40	42	45
Payment in Lieu of Taxes	16	17	18	20	23	27
Retirement System, FICA, Health, Etc.	118	133	140	145	150	160
Debt Service Charges on Waterworks Bonds	9	8	8	-	-	-
TOTAL	12,297	13,115	14,032	14,984	16,099	17,344

<sup>1</sup> Finance Department, County of Kauai, 1975.

<sup>2</sup> Federal Government revenue sharing funds are not included as a projected revenue source.

TABLE IV-4

WELI WELI HOUSE LOTS SUBDIVISION, POIPU, KAUAI<sup>1</sup>

<u>Parcel</u>	<u>Tax Map Key</u>	<u>Land Use Code</u>	<u>Area (Sq. Ft.)</u>	<u>Assessed Land Value</u>	<u>Assessed Building Value</u>
1	2-8-23-1	1	11,780	\$ 9,625	\$31,047
2	-2	1	8,785	7,687	20,211
3	-3	1	9,856	8,624	20,761
4	-4	1	10,707	9,369	25,433
5	-5	1	11,925	10,434	32,634
6	-6	1	10,265	8,982	31,815
7	-7	1	10,001	8,751	25,810
8	-8	1	11,444	10,014	28,680
9	-9	1	10,599	9,239	21,135
10	-10	1	9,751	8,532	21,031
11	-11	1	9,600	8,400	26,054
12	-12	1	9,600	8,400	21,031
13	-13	1	9,600	8,400	29,541
14	-14	1	9,600	8,400	30,712
15	-15	1	9,600	8,400	30,003
16	-16	1	9,600	8,400	34,624
17	-17	1	9,920	8,680	29,567
18	-18	1	9,920	8,680	32,753
19	-19	1	9,920	8,680	21,520
20	-20	1	9,920	8,680	33,582
21	-21	1	10,314	9,025	21,881
22	-22	1	10,314	9,025	21,881
23	-23	1	9,600	8,400	21,881
24	-24	1	9,600	8,400	21,881
25	-25	1	9,600	8,400	21,881
<b>TOTAL</b>			<b>251,781</b>	<b>\$219,627</b>	<b>\$657,350</b>
<b>Average Area (square feet):</b>			<b>10,071</b>		
<b>Average Assessed Land Value:</b>			<b>\$8,785</b>		
<b>Average Assessed Building Value:</b>			<b>\$26,294</b>		

<sup>1</sup>Department of Taxation, State of Hawaii.

to the State Department of Taxation, the assessed land and building values associated with the multi-family units are estimated to be \$10,000 and \$31,500, respectively (see Table IV-5).

The market land valuation of the 150+ acre planned golf course is estimated to be approximately \$6,000 per acre. The assessed land value would be \$4,200 per acre. This figure is consistent with other golf courses on Kauai. Because the design of the Moana Project places dwelling units adjacent to the planned golf course, the estimated market value of \$6,000 per acre may be a conservative figure.<sup>1</sup>

The golf clubhouse and convenience commercial center are planned to cover a land area of 0.92 acres or approximately 40,000 square feet. The market value of the land would be approximately \$4.30 per square foot. The assessed land value is \$3.00 per square foot. The market value of the structures is expected to be \$60 per square foot or an assessed value of \$42 per square foot.

The expansion of the tennis court complex would include ten additional courts on 5 acres of land plus a 5,000 square foot clubhouse. The market value of the land would be \$25,000 per tennis court and \$30 per square foot for the clubhouse area. The respective assessed values would be \$17,500 per tennis court and \$21 per square foot for the clubhouse area.

The total assessed value of the property and dwellings for the project at the end of the 20-year development period is estimated to be \$76,240,000 (Table IV-6). County of Kauai tax rates are set forth in Table IV-7. If no development were to occur during the 20-year period, the assessed valuation for the land under consideration would remain at \$1,541,807 (Table IV-8).

---

<sup>1</sup>246-12:1, Chapter 246, Real Property Tax Law, State of Hawaii, July, 1973.

TABLE IV-5

ESTIMATED ASSESSED VALUATION PER UNIT FOR THE MOANA PROJECT<sup>1</sup>

	<u>Assessed Land Value</u>	<u>Assessed Building Value</u>	<u>Total Assessed Valuation</u>
Single-Family Units	\$ 10,500	\$ 30,000	\$ 40,500 <sup>2</sup>
Multi-Family Units	10,500	31,500	42,000 <sup>2</sup>
18-Hole Golf Course	840,000		840,000
Clubhouse	30,000	420,000	450,000
Commercial Center	90,000	1,260,000	1,350,000
Tennis Court Complex	683,000	385,000	1,068,000

<sup>1</sup>McDonald & Smart, Inc.

<sup>2</sup>Total assessed valuation per unit.

TABLE IV-6

ESTIMATED ASSESSED VALUE OF PROPERTY AND DWELLINGS FOR THE MOANA PROJECT  
(In Thousands of Dollars)

	Years <sup>1</sup>									
	1	2	3	4	5	6	7	8	9	10
Single-Family Units										
Improved Land	210	420	630	840	1,050	1,260	1,470	1,680	1,890	2,100
Building Value	120	360	720	1,200	1,800	2,400	3,000	3,600	4,200	4,800
Multi-Family Units										
Improved Land	1,050	1,838	2,626	3,414	4,202	4,990	5,778	6,566	7,354	8,142
Building Value	4,200	7,350	10,500	13,650	16,800	19,950	23,100	26,250	29,400	32,550
18-Hole Golf Course (Land Value Only)	420	840	840	840	840	840	840	840	840	840
Golf Clubhouse										
Improved Land	30	30	30	30	30	30	30	30	30	30
Building Value	420	420	420	420	420	420	420	420	420	420
Convenience Commercial Center										
Improved Land	45	45	45	45	90	90	90	90	90	90
Building Value	630	630	630	1,260	1,260	1,260	1,260	1,260	1,260	1,260
Tennis Complex										
Improved Land	342	683	683	683	683	683	683	683	683	683
Building Value	192	385	385	385	385	385	385	385	385	385
Moana Project Total Assessed Valuation Per Fiscal Year	7,659	13,001	17,509	22,767	27,560	32,308	37,056	41,804	46,552	51,300

<sup>1</sup>Year 1 represents the 1977-78 fiscal year.

Source: McDonald & Smart, Inc.

Table IV-6, Continued

	Years									
	11	12	13	14	15	16	17	18	19	20
Single-Family Units										
Improved Land	2,310	2,520	2,730	2,940	3,150	3,150	3,150	3,150	3,150	3,150
Building Value	5,400	6,000	6,600	7,200	7,800	8,280	8,640	8,880	9,000	9,000
Multi-Family Units										
Improved Land	8,930	9,718	10,506	11,294	12,082	12,082	12,082	12,082	12,082	12,082
Building Value	35,700	38,850	42,000	45,150	48,300	48,300	48,300	48,300	48,300	48,300
18-Hole Golf Course (Land Use Value Only)	840	840	840	840	840	840	840	840	840	840
Golf Clubhouse										
Improved Land	30	30	30	30	30	30	30	30	30	30
Building Value	420	420	420	420	420	420	420	420	420	420
Convenience Commercial Center										
Improved Land	90	90	90	90	90	90	90	90	90	90
Building Value	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260
Tennis Complex										
Improved Land	683	683	683	683	683	683	683	683	683	683
Building Value	385	385	385	385	385	385	385	385	385	385
Moana Project Total Assessed Valuation Per Fiscal Year	56,048	60,796	65,544	70,292	75,040	75,520	75,880	76,120	76,240	76,240

TABLE IV-7

COUNTY OF KAUAI TAX RATE PER \$1,000 ASSESSED VALUATION, 1974-75<sup>1</sup>

<u>Land Use Classes</u>	<u>Tax Rate Per \$1,000 Net Taxable Land</u>	<u>Tax Rate Per \$1,000 Net Taxable Building</u>
1. Improved Residential	\$14.50	\$14.50
2. Hotel/Apartment/Resort	11.78	16.82
3. Commercial	11.98	17.11
4. Industrial	12.66	18.08
5. Agricultural	14.50	14.50
6. Conservation	14.50	14.50
7. Unimproved Residential	10.84	15.48

<sup>1</sup>Department of Taxation, State of Hawaii.

TABLE IV-8  
 PROPERTY TAX REVENUE FROM THE KNUDSEN TRUST IN THE KOLOA-POIPU AREA<sup>1</sup>

Tax Map Key	Owner	Lessee	Assessed Value	1974-75 Tax Bill
2-6-4-15	McBryde Sugar Co.		\$ 124,250	\$ 1,973.01
2-8-12-1	Knudsen Trust	Grove Farm Co.	922	13.37
2-8-12-9	Grove Farm Co.	Poipu Ranch Co.	72	7.00
2-8-13-2	Grove Farm Co.	Poipu Ranch Co.	172	7.00
2-8-13-4	Roman Catholic Church		20,636	299.22
2-8-13-5	Grove Farm Co.		27	7.00
2-8-14-1	Knudsen Trust	Poipu Ranch Co.	110,208	1,462.46
2-8-14-5	Knudsen Trust	Poipu Ranch Co.	47,559	443.93
2-8-14-6	Knudsen Trust	Poipu Ranch Co.	27	7.00
2-8-14-7	Grove Farm Co.	Poipu Ranch Co.	188	7.00
2-8-14-8	Knudsen Trust	Poipu Ranch Co.	364	7.00
2-8-15-77	Grove Farm Co.	Poipu Ranch Co.	56	7.00
2-8-17-10	Knudsen Trust		539,692	9,075.86
2-8-17-11	Knudsen Trust		253,435	4,096.56
2-8-17-13	Grove Farm Co.		13,125	220.76
2-8-17-14	Grove Farm Co.		9,030	139.78
2-8-17-16	Knudsen Trust		104,718	7.00
2-8-17-24	Knudsen Trust		194,481	3,010.57
2-8-17-25	Knudsen Trust		122,850	1,901.72
		Kauai County YMCA		
TOTAL			\$1,541,807	\$22,656.24

<sup>1</sup> Department of Taxation, State of Hawaii, 1975

The real property tax revenue realized by the County of Kauai from the Moana Project will increase during the development period from \$119,669 per year to \$1,153,198 per year. The figures are in current dollars and reflect no inflation factor. (See Table IV-9).

b. Public Utility Franchise Tax

The franchise tax represents 2.5% of the gross revenues of the public utilities on Kauai. They are Kauai Electric and Gasco. The revenues obtained by the county can be attributed primarily to Kauai Electric. The total contributions from Gasco are less than \$1,000 annually. Gasco only sells a small portion of its product through a centralized distribution system.

The franchise tax revenues obtained by the county as a result of the Moana Project are projected on a per dwelling unit basis. According to Kauai Electric, the average annual use per dwelling unit is 4,861 KWH at an average rate of \$0.04655 per KWH. The revenues from the public utility franchise tax at the end of the development period are estimated to be \$8,207 per year. (See Table IV-12 later in this section.)

c. Licenses and Permits

Assuming that the State Land Use Commission reclassifies the Knudsen Trusts in the Koloa-Poipu area from agricultural to urban land use and the Kauai County Council agrees to the General Plan and zoning amendments, the fees the county will receive for the various fees are:

General Plan Amendment Fee	\$100.00
Zoning Amendment Fee	50.00
Zoning Permit Fee:	
Single-Family Lots	3.00 per lot
Multi-Family Units	150.00 total
Commercial	150.00 total

TABLE IV-9  
ESTIMATED PROPERTY TAX REVENUE FROM THE MOANA PROJECT  
(In Dollars)

	Years <sup>1</sup>									
	1	2	3	4	5	6	7	8	9	10
Single-Family Units										
Improved Land	3,045	6,090	9,135	12,180	15,225	18,270	21,315	24,360	27,405	30,450
Building Value	1,740	5,220	10,440	17,400	26,100	34,800	43,500	52,200	60,900	69,600
Homeowner's Exemption	(464)	(1,392)	(2,784)	(4,649)	(6,960)	(9,280)	(11,640)	(13,960)	(16,280)	(18,600)
Multi-Family Units										
Improved Land	12,369	21,652	30,934	40,217	49,499	58,782	68,065	77,347	86,630	95,913
Building Value	70,644	123,627	176,610	229,593	282,576	335,559	388,542	441,525	494,508	547,491
18-Hole Golf Course (Land Value Only)	6,090	12,280	12,180	12,180	12,180	12,180	12,180	12,180	12,180	12,180
Golf Clubhouse										
Improved Land	359	359	359	359	359	359	359	359	359	359
Building Value	7,186	7,186	7,186	7,186	7,186	7,186	7,186	7,186	7,186	7,186
Convenience Commercial Center										
Improved Land	539	539	539	539	1,078	1,078	1,078	1,078	1,078	1,078
Building Value	10,779	10,779	10,779	10,779	21,559	21,559	21,559	21,559	21,559	21,559
Tennis Complex										
Improved Land	4,097	8,182	8,182	8,182	8,182	8,182	8,182	8,182	8,182	8,182
Building Value	3,285	6,587	6,587	6,587	6,587	6,587	6,587	6,587	6,587	6,587
Moana Project Total Tax Revenue Per Fiscal Year	119,669	201,109	270,147	340,553	423,571	495,262	566,913	638,603	710,294	781,985

<sup>1</sup>Year 1 represents the 1977-78 fiscal year.

Source: McDonald & Smart, Inc.

Table IV-9, Continued

	Years									
	11	12	13	14	15	16	17	18	19	20
Single-Family Units										
Improved Land	33,495	36,540	39,585	42,630	45,675	45,675	45,675	45,675	45,675	45,675
Building Value	78,300	87,000	95,700	104,400	113,100	120,060	125,280	128,760	130,500	130,500
Homeowners' Exemption	(20,920)	(23,240)	(25,560)	(27,880)	(30,200)	(32,056)	(33,448)	(34,376)	(34,840)	(34,840)
Multi-Family Units										
Improved Land	105,195	114,478	123,761	133,043	142,326	142,326	142,326	142,326	142,326	142,326
Building Value	600,474	653,457	706,440	759,423	812,406	812,406	812,406	812,406	812,406	812,406
18-Hole Golf Course (Land Value Only)	12,180	12,180	12,180	12,180	12,180	12,180	12,180	12,180	12,180	12,180
Golf Clubhouse										
Improved Land	359	359	359	359	359	359	359	359	359	359
Building Value	7,186	7,186	7,186	7,186	7,186	7,186	7,186	7,186	7,186	7,186
Convenience Commercial Center										
Improved Land	1,078	1,078	1,068	1,078	1,078	1,078	1,078	1,078	1,078	1,078
Building Value	21,559	21,559	21,559	21,559	21,559	21,559	21,559	21,559	21,559	21,559
Tennis Complex										
Improved Land	8,182	8,182	8,182	8,182	8,182	8,182	8,182	8,182	8,182	8,182
Building Value	6,587	6,587	6,587	6,587	6,587	6,587	6,587	6,587	6,587	6,587
Moana Project Total Tax Revenue Per Fiscal Year	853,675	925,366	997,047	1,068,747	1,140,438	1,145,542	1,149,370	1,151,922	1,153,198	1,153,198

The total General Plan and zoning fees as a result of the Moana Project are \$1,350.

The building permit fee schedule is shown in Table IV-10. Applying the schedule to the estimated buildout schedule, the total Moana Project building permit fees realized by the County are \$71,720.

d. State Grants-in-Aid

The largest source of revenues from other agencies is State grants-in-aid. The legislation determining the distribution of the state grants-in-aid is Act 114, Session Laws of Hawaii, enacted in 1973. The amount of the State grants-in-aid from the State of Hawaii's general fund allocated to the several counties is legislated to be at least equal to the cash amount received in the 1971-72 fiscal year. The Governor then determines any additional revenues to be allocated based on each county's relative fiscal capacity and each county's relative fiscal need.

The amount that the County of Kauai was appropriated for the 1971-72 fiscal year under this program was \$3,190,821. Since Act 114 was enacted, the amount of the State grants-in-aid received by Kauai County has remained at approximately \$3,191,000. Referring to Table IV-3, the Kauai County Finance Department's 6-year projected revenue analysis does not envision this amount to change even in the event of population growth. In the event of the Moana Project, the amount of grants-in-aid received by the County of Kauai are assumed not to be affected.

e. Charges for Current Services

Of the charges for current services, only safety charges are affected as a result of the Moana Project. The other sources of revenues from current services are general government,

TABLE IV-10

BUILDING PERMIT FEE SCHEDULE<sup>1</sup>

<u>Total Estimated Valuation of Work</u>	<u>Fee to be Charged</u>
Less than \$2,000	No fee
\$2,001 to \$25,000	\$20 for the first \$2,000 plus \$2.50 for each additional thousand or fraction thereof, to and including \$25,000.
\$25,001 to \$50,000	\$77.50 for the first \$25,000 plus \$2 for each additional thousand or fraction thereof, to and including \$50,000
\$50,001 to \$100,000	\$127 for the first \$50,000 plus \$1.50 for each additional thousand or fraction thereof, to and including \$100,000.
\$100,001 and up	\$202.50 for the first \$100,000 plus \$1 for each additional thousand or fraction thereof.

<sup>1</sup>Planning Department, County of Kauai.

TABLE IV-11

ESTIMATED STATE PERSONAL INCOME TAX REVENUES  
RESULTING FROM MOANA PROJECT

State Income Tax Schedule <sup>1</sup>		
<u>Income</u>	<u>Tax Rate</u>	<u>State Income</u>
\$ 500	2.25%	\$ 11.25
500	3.25	16.25
500	4.50	22.50
500	5.00	25.00
1,000	6.50	65.00
2,000	7.50	150.00
5,000	8.50	425.00
<b>Total</b>		<b>\$715.00</b>

Moana Project <sup>2</sup>	
Average Employee Salary	\$10,000
Average Employee Deductions	2,250
Average Employee Tax Burden	523.75

<sup>1</sup>Tax Foundation of Hawaii, Government in Hawaii, 1975.

<sup>2</sup>McDonald & Smart, Inc.

sanitation, and recreation; and it is assumed they are not influenced in the eventuality of the Moana Project. For instance, almost all of the revenues from recreation services are a result of the golf fees from the Wailue Golf Course. The Moana Project is not expected to increase the revenue obtained from the Wailua Golf Course since a golf course is planned as a part of the proposed project.

Drivers license examination fees and vehicle inspection fees comprise approximately 99% of the revenues from safety charges. The 1975-76 per capita revenues from safety charges are estimated to be \$1.03 per capita (see Table IV-1). The annual safety charge revenues realized by the County of Kauai at the end of the development period as a result of the Moana Project are \$464 (see Table IV-12).

The net resident population figures were used in the calculations. It is assumed that the increase in the tourist population will not affect the safety charge revenue to any significant extent.

f. Revenue Sharing

Revenue-sharing funds are received by the County of Kauai according to a schedule devised by the Federal government. The present revenue-sharing program is to continue to 1976. Whether it will be extended is not presently known. For the purpose of this analysis, we expect the Federal government's State and Local Fiscal Assistance Act of 1972 (revenue-sharing program) to continue when the present program expires.

The increase in the county's revenue-sharing funds is estimated on a per capita basis using the net resident population increase as a result of the Moana Project. The annual revenue-sharing funds attributed to the project at the end of the development period is \$8,982 per year (see Table IV-12).

TABLE IV-12  
ESTIMATED COUNTY OF KAUAI PUBLIC REVENUES FROM MOANA PROJECT  
(In Dollars)

	Years <sup>1</sup>									
	1	2	3	4	5	6	7	8	9	10
Real Property Tax	119,669	201,109	270,147	340,553	423,571	495,262	566,913	638,603	710,294	781,985
Public Utility										
Franchise Tax	598	1,058	1,551	2,066	2,604	3,141	3,679	4,217	4,754	5,292
Licenses, Permits	7,259	4,069	4,033	4,293	5,286	4,553	4,553	4,553	4,553	4,553
State Grants-in-Aid	--	--	--	--	--	--	--	--	--	--
Charge for Current Service Revenue Sharing	6	19	37	62	98	124	155	185	216	247
Total Annual Revenues	127,652	201,614	276,487	348,172	433,350	505,475	578,294	651,151	724,009	796,867
Cumulative Annual Revenues	127,652	334,266	610,753	958,925	1,392,275	1,897,750	2,476,044	3,127,195	3,851,204	4,648,071
	11	12	13	14	15	16	17	18	19	20
Real Property Tax	853,675	925,366	997,047	1,068,747	1,140,438	1,145,542	1,149,370	1,151,922	1,153,198	1,153,198
Public Utility										
Franchise Tax	5,830	6,368	6,905	7,443	7,981	8,071	8,139	8,184	8,207	8,207
Licenses, Permits	4,553	4,553	4,553	4,553	4,553	1,040	780	520	260	--
State Grants-in-Aid	--	--	--	--	--	--	--	--	--	--
Charge for Current Service Revenue Sharing	278	309	340	371	402	426	445	457	464	464
Total Annual Revenues	5,389	5,988	6,587	6,186	7,784	8,263	8,623	8,862	8,982	8,982
Cumulative Annual Revenues	869,725	942,584	1,015,432	1,088,302	1,161,158	1,163,342	1,167,357	1,169,945	1,171,111	1,170,851
	5,517,796	6,460,380	7,475,812	8,564,114	9,725,272	10,888,614	12,055,971	13,225,916	14,397,027	15,567,878

<sup>1</sup>Year 1 represents the 1977-78 fiscal year.

Source: McDonald & Smart, Inc.

## State of Hawaii Public Revenues

The major public revenues discussed here are general excise taxes on gross receipts and State personal income tax revenue. The convenience commercial center is expected to generate substantial revenues to the State.

### a. Excise Taxes (on rental leases)

The convenience commercial center's lease rental will be approximately \$2.00 per square foot monthly or \$24.00 per square foot annually. This figure is derived from a base plus a percentage of the estimated gross sales. Using the State's general excise tax of 4%, the total estimated annual revenues accruing to the State's general fund are \$28,800.<sup>1</sup>

### b. Excise Taxes (on retail sales)

We estimate that the retail sales of the commercial center will be approximately \$50 per square foot annually. Once the convenience commercial center is fully developed, the total revenues to the State from the retail sales are estimated to be \$60,000.<sup>1</sup>

### c. State Personal Income Taxes

Construction and tourist activity related jobs created by the Moana Project are estimated to range from 192 jobs in period 1 to 495 jobs in period 15. After the construction phase is completed in period 15, the permanent level of employment should remain at approximately 390. The per capita rate used to estimate the total annual income tax is shown in Table V-11. The annual estimated personal income tax revenues realized by the State is shown in Table IV-13 later in this section.

---

<sup>1</sup>See Table IV-13.

### Public Revenue Summary

Tables IV-12 and IV-13 show both the County and State public revenues realized from the Moana Project. Once the project is developed, public revenues to the County of Kauai are estimated to be \$1,170,851 annually; revenues to the state are estimated to be \$293,063 annually. Since only the major revenue categories were analyzed (e.g., gas tax revenues are not included), the above figures are conservative estimates as to the actual increase in public revenues that are expected to be generated by the Moana Project.

### PUBLIC/PRIVATE SERVICE EXPENDITURES

In this section, each major expenditure source that will be affected as a result of the Moana Project is analyzed. This includes both the County and State revenues and selected private services currently available to the residents of the Koloa-Poipu area.

#### County of Kauai Public Service Expenditures

The major public services provided by the County of Kauai are analyzed as they relate to the proposed Moana Project. Primary attention is given to the effects the Moana Project will have on the level of public services currently available to the residents of the Koloa-Poipu area. Existing public facilities in the Koloa-Poipu region are shown in Figure IV-1.

Table IV-14 describes Kauai County's adopted 1975-76 operating budget. Included are the percentage breakdowns and per capita expenditures for each of the various expenditure categories.

TABLE IV-13  
ESTIMATED STATE OF HAWAII PUBLIC REVENUES FROM MOANA PROJECT  
(In Dollars)

	Years <sup>1</sup>									
	1	2	3	4	5	6	7	8	9	10
Excise Taxes (Rental Lease)	14,400	14,400	14,400	14,400	28,800	28,800	28,800	28,800	28,800	28,800
Excise Taxes (Retail Sales)	30,000	30,000	30,000	30,000	60,000	60,000	60,000	60,000	60,000	60,000
Personal Income Taxes	100,560	111,559	122,034	134,604	145,603	156,601	168,124	178,599	191,693	202,691
Total Annual Revenues	144,960	155,959	166,434	179,004	234,403	245,401	256,924	267,399	280,493	291,491
Total Annual Revenues Cumulative Annual Revenues	144,960	300,919	467,353	646,357	880,760	1,126,161	1,383,085	1,650,484	1,930,977	2,222,468
	11	12	13	14	15	16	17	18	19	20
Excise Taxes (Rental Lease)	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800
Excise Taxes (Retail Sales)	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Personal Income Taxes	213,690	225,213	276,211	247,210	259,256	204,263	204,263	204,263	204,263	204,263
Total Annual Revenues	302,490	314,013	365,011	336,010	348,056	293,063	293,063	293,063	293,063	293,063
Total Annual Revenues Cumulative Annual Revenues	2,524,958	2,838,971	3,203,982	3,539,992	3,888,048	4,181,111	4,474,174	4,767,237	5,060,300	5,353,363

<sup>1</sup>Year 1 represents the 1977-78 fiscal year.

Source: McDonald & Smart, Inc.

TABLE IV-14

## COUNTY OF KAUAI ESTIMATED EXPENDITURES, 1975-76

Estimated Expenditures by Source	1975-76 Appropriated Budget <sup>1</sup>	Per Cent of Total Budget	1975-76 Per Capita Expenditures <sup>2</sup>	1974-75 Authorized Positions <sup>3</sup>
Legislative Functions	\$ 403,224	2.98	\$ 13.01	19
Management and Other Services	2,324,723	17.16	74.99	123
Public Safety				116
Police	1,980,477	14.62	63.89	96
Fire	1,626,707	12.01	52.47	10
Other Public Safety	143,061	1.06	4.61	16
Social Welfare	211,865	1.56	6.83	
Highway and Equipment Maintenance	1,585,419	11.70	51.14	111
Health and Environmental Services				
Solid Waste Disposal Division	135,530	1.00	4.37	17
Sewer Division	202,470	1.49	6.53	10
Parks and Recreation				16
Golf Course	219,606	1.62	7.08	62
Other Parks and Recreation	809,102	5.97	26.10	-- <sup>4</sup>
Debt Service Charge	1,654,727	12.21	53.38	
Fringe Benefits and Other Costs	<u>2,247,992</u>	<u>16.61</u>	<u>72.52</u>	<u>--<sup>4</sup></u>
Total	\$13,544,909	100.00%	\$436.92	596

<sup>1</sup> County of Kauai Operating Budget Ordinance, Ordinance No. B-12-75, Bill No. 319 (as amended), Fiscal Year July 1, 1975 to June 30, 1976.

<sup>2</sup> Per capita expenditures were derived using 1977 estimated population figures from the Department of Planning and Economic Development, State of Hawaii, 1975.

<sup>3</sup> County of Kauai Tentative Operating Budget, Fiscal Year July 1, 1975 to June 30, 1976.

<sup>4</sup> Administered through the management and other services category.

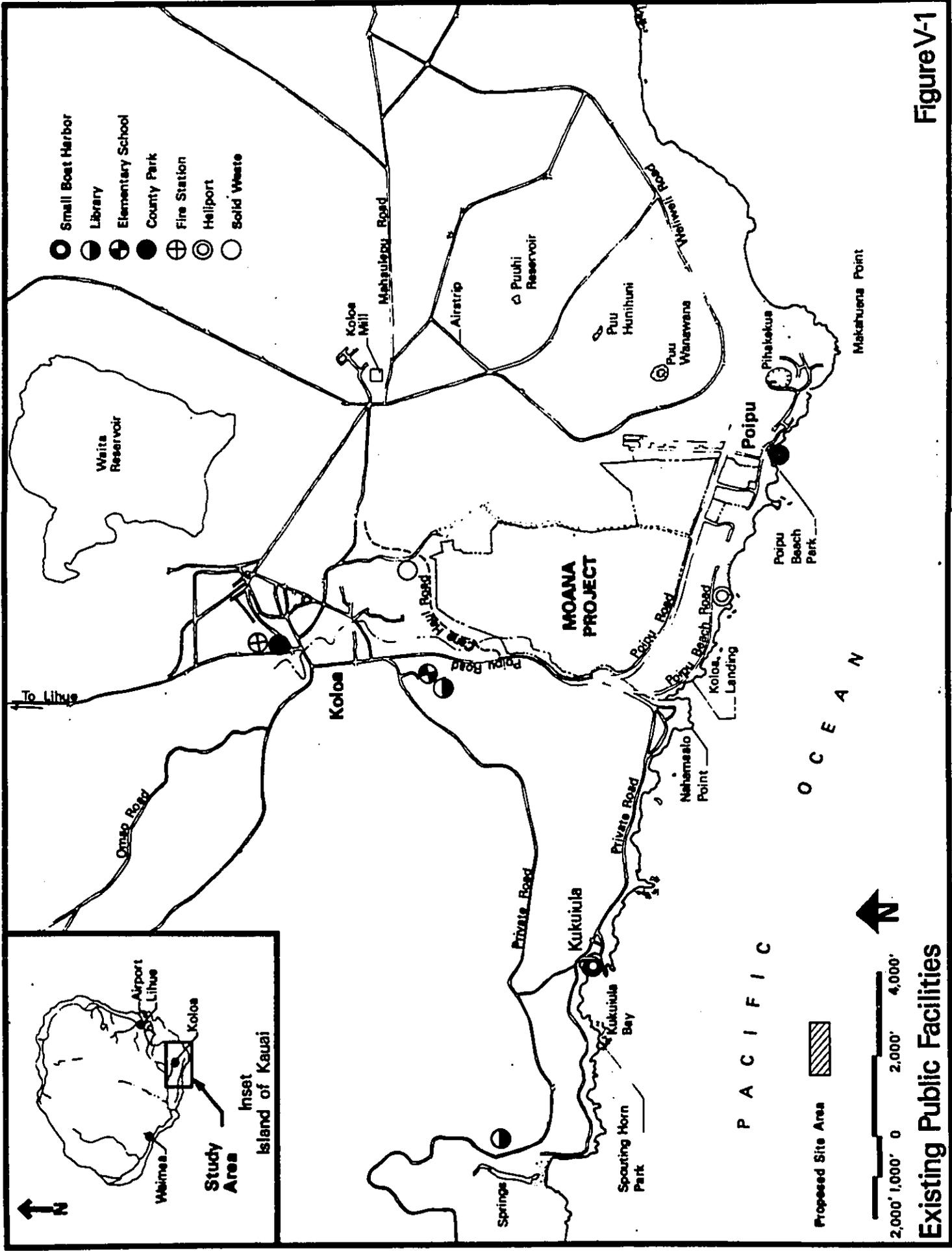


Figure V-1

Table IV-15 shows the changes occurring in county expenditures during the periods 1970 to 1975-76. The largest percentage increase (129.69%) occurred in the Parks and Recreation Department's budget.

Table IV-16 estimates the Kauai County public service expenditures for the 6-year period 1975-76 to 1980-81. The largest increase is expected to take place in public safety expenditures.

a. Police Department

The Koloa-Poipu area is currently serviced by the Waimea sub-station. The personnel at that station include three sergeants, twenty police officers, and two police recruits. They work three shifts of 8 hours each. There are three to four men working each shift.

The response time of a police officer to a dispatched radio broadcast currently is estimated to be between 5 to 7 minutes and is one indication of the level of police services currently available. According to the Kauai Police Department, the presence of a development similar to the Moana Project should not measurably affect the response time of the officers to calls. However, the increased population in the area might result in a higher frequency of calls. In the eventuality of the Moana Project, the current manpower assigned to the area should be able to furnish adequate police protection until around the eighth year of the project. As the population in the area increases, both residential and tourist, the rising police activity would necessitate the creation of a beat to serve the Koloa-Poipu area exclusively. According to the Kauai Police Department, this will require the addition of three patrolmen and an additional patrol unit. Table IV-17 gives the estimated cost of this increased police manpower.

TABLE IV-15

CHANGE IN COUNTY EXPENDITURES, 1970-71 TO 1975-76  
(In Thousands of Dollars)

	<u>1970-71</u> <sup>1</sup>	<u>1975-76</u> <sup>2</sup>	<u>% Change</u>
Legislative Functions	\$ 213	\$ 403	89.20%
Management and Other Services	1,297	2,325	79.26
Public Safety	2,816	3,750	71.55
Social Welfare	60	212	253.33
Highway and Equipment Maintenance	985	1,585	60.91
Health and Environmental Services	244	338	38.52
Parks and Recreation	448	1,029	129.69
Fringe Benefits and Other Costs	<u>1,322</u>	<u>2,248</u>	70.05
Total Estimated Expenditures	\$ 7,412	\$13,545	82.74%
County Population	29,761	31,000	1.04%
Per Capita Expenditures	\$249.05	\$436.93	75.44%

<sup>1</sup>County of Kauai Operating Budget Ordinance, Ordinance No. B-1, Bill No. 43, Fiscal Year July 1, 1975 to June 30, 1976.

<sup>2</sup>County of Kauai Operating Budget Ordinance, Ordinance No. B-12-75, Bill No. 319 (as amended), Fiscal Year July 1, 1975 to June 30, 1976.

TABLE IV-16

COUNTY OF KAUAI SIX-YEAR STATEMENT OF ESTIMATED  
EXPENDITURES FOR FISCAL YEARS 1975-76 THROUGH 1980-81<sup>1</sup>  
(In Dollars)

	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
	\$ 403	\$ 400	\$ 400	\$ 484	\$ 533	\$ 586
Legislative Functions	2,325	2,571	2,828	3,110	3,422	3,764
Management and Other Services	3,750	4,291	4,720	5,192	5,712	6,283
Public Safety	212	249	249	274	301	331
Social Welfare	1,585	1,811	1,992	2,191	2,410	2,651
Highway and Equipment Maintenance	338	367	404	444	489	538
Health and Environmental Services	1,029	1,148	1,263	1,389	1,528	1,681
Parks and Recreation	1,655	1,681	1,935	1,877	1,820	1,764
Debt Service Charges	2,248	2,170	2,279	2,393	2,511	2,637
Fringe Benefits and Other Costs						
Total Estimated Expenditures	\$13,545	\$14,688	\$16,110	\$17,354	\$18,726	\$20,235

<sup>1</sup>Finance Department, County of Kauai, 1975.

TABLE IV-17  
ANNUAL COST OF INCREASED POLICE PROTECTION

	Years <sup>1</sup>									
	1	2	3	4	5	6	7	8	9	10
Three Patrolmen <sup>2</sup>	--	--	--	--	--	\$27,252	\$30,096	\$33,192	\$34,812	\$36,576
Fringe Benefits <sup>3</sup>	--	--	--	--	--	10,585	11,689	12,892	13,521	14,206
One Patrol Unit <sup>4</sup>	--	--	--	--	--	--	9,500	2,000	9,500	2,000
Total						\$37,837	\$51,285	\$48,084	\$57,833	\$52,782
Three Patrolmen <sup>2</sup>	\$38,412	\$40,284	\$42,300	\$42,300	\$42,300	\$44,424	\$44,424	\$44,424	\$46,692	\$46,692
Fringe Benefits <sup>3</sup>	14,919	15,646	16,429	16,429	16,429	17,254	17,254	17,254	18,135	18,135
One Patrol Unit <sup>4</sup>	9,500	2,000	9,500	2,000	9,500	2,000	9,500	2,000	9,500	2,000
Total	\$62,831	\$57,930	\$68,229	\$60,729	\$68,229	\$63,678	\$71,178	\$63,678	\$74,327	\$66,827

<sup>1</sup>Year 1 represents the 1977-78 fiscal year.

<sup>2</sup>The salaries are based on the Kauai Police Department's present salary (July 1, 1975).

<sup>3</sup>Fringe benefits and other costs were estimated to be 38.84% of the salary figures based on a rate obtained from the Department of Finance, County of Kauai. The 38.84% excluded FICA contributions.

<sup>4</sup>The patrol unit was estimated to cost approximately \$5,000 plus \$2,000 to equip the vehicle for patrol, and \$2,000 per year maintenance and repair. The vehicle is replaced every two years.

Table IV-18 shows that over the period 1970 to 1975 the numerical strength, operating expenditures, and per capita operating expenditures all increased considerably for the Kauai Police Department while the population per police staff has declined. It should be noted that the population figures do not include the transient or tourist population.

Table IV-19 describes the trend in the Kauai Police Department's activity over the last few years. During this period, Part I crimes increased 116.33%, while the number of Part I crimes cleared increased 172.15%. This may be interpreted as an increase in the investigative effectiveness of the Kauai Police Department.

b. Fire Department

Fire protection for the Koloa-Poipu area is the responsibility of the Kauai County Fire Department. Presently there is in Koloa a fire station located approximately 2 miles from the project site. At the Koloa fire station, there are three captains and nine firemen assigned. The twelve men operate in three platoons, where each platoon works shifts of 24 hours per shift (56 hours per week). The primary vehicle at the station is a 1969 Crown "Pumper" truck with 1,200 gallons per minute (gmp) pumping capacity and a 1,000 gmp "Pumper" truck. This backup unit will, in the near future, be transferred to the Lihue Fire Station, leaving only the 1,200 gmp pumper to serve the Koloa-Poipu area.

The Hawaii Insurance Rating Board (HIRB) has designated the Poipu area to have a Class 6 rating for fire insurance purposes. This rating is on a scale of 1 to 10, with the lower numbers denoting higher ratings. The HIRB's ratings are determined by a number of factors including the size of the water mains, locations of fire hydrants, type of fire equipment available, etc. The Class 6 rating for the Poipu area

TABLE IV-18

KAUAI POLICE DEPARTMENT

	<u>1970<sup>1</sup></u>	<u>1975<sup>2</sup></u>	<u>% Change</u>
Numerical Strength	94	116	23.40
Operating Expenditures	\$1,007,358	\$1,980,447	96.60
Per Capita Operating Cost	\$34	\$64	88.24
Population Per Police Staff	317	267	-15.77

<sup>1</sup>Annual Report, Kauai Police Department, 1970.

<sup>2</sup>County of Kauai Tentative Operating Budget, Fiscal Year July 1, 1975 to June 30, 1976; County of Kauai Operating Budget Ordinance. Ordinance No. B-12-75, Bill No. 319 (as amended), Fiscal Year July 1, 1975 to June 30, 1976.

TABLE IV-19

KAUAI POLICE ACTIVITY<sup>1</sup>

	<u>1970</u>	<u>1974</u>	<u>% Change</u>
Number of Radio Messages Broadcasted	175,979	170,102	5.89
Number of Actual Part I Offenses <sup>2</sup>	992	2,146	116.33
Number of Part I Offenses Cleared	237	645	172.15
Per Cent of Part I Offenses Cleared	23.9	30.1	25.94
Number of Actual Part II Offenses <sup>3</sup>	1,637	1,113	-32.00
Total Motor Vehicle Traffic Accidents	777	841	8.24

<sup>1</sup>Annual Report, Kauai Police Department, 1970 and 1974.

<sup>2</sup>Part I Offenses: Murder, manslaughter, rape, robbery, assault, burglary, larceny-theft, auto theft.

<sup>3</sup>Part II Offenses: Other assaults, forgery and counterfeit, embezzlement and fraud, stolen property, weapons, prostitution, other sex offenses, offenses versus family, drug laws, liquor laws, drunkenness, disorderly conduct, vagrancy, gambling, drunk driving, all other offenses.

is about average relative to the Honolulu area with a Class 3 rating. The standards for an area are reviewed every 8 to 10 years, or in the occurrence of a major development in the area, whichever comes first.

Table IV-20 sets forth estimated annual costs of increased fire protection with the Moana Project.

Table IV-21 shows the activities handled by the Kauai Fire Department. In viewing the statistics, one should understand that in small areas such as Koloa-Poipu, the infrequency and random nature of occurrences can often skew the results. An example would be the estimated 1970 fire losses in the Koloa-Poipu area of \$354,979, of which \$335,463 was a result of a single occurrence.

c. Solid Waste

Solid waste disposal for the Koloa-Poipu area currently is handled by the Koloa dump, located on the mauka side of the proposed development. Presently, hotels in the area haul their own rubbish to the open dump site, while the residents have county operators pick up the solid waste on a periodic basis provided they place the trash containers next to a county road. County staff at the Koloa dump includes a full-time employee.

According to Kauai's Department of Health and Environmental Services, solid waste disposal for Kauai will in the future (2 years) be handled by a centralized sanitary landfill. This will be in compliance with Chapter 43, Air Pollution Control, Public Health Regulations, published by the Department of Health, State of Hawaii. The exact site and operating costs are unknown at this time. Possibly the rubbish collection and maintenance costs of the sanitary landfill could be handled through user charges of some sort. Since the plans to develop the new sanitary landfill are not as a direct result of the Moana Project, its development is not considered a project cost.

TABLE IV-20  
ESTIMATED ANNUAL COST OF INCREASED FIRE PROTECTION WITH MOANA PROJECT

	Years <sup>1</sup>									
	1	2	3	4	5	6	7	8	9	10
Captain <sup>2</sup>	--	--	--	--	--	--	--	\$ 15,072	\$ 15,756	\$ 16,488
Fire Apparatus Operator <sup>2</sup>	--	--	--	--	--	--	--	12,636	13,212	13,788
Firefighter <sup>2</sup>	--	--	--	--	--	--	--	31,896	33,300	34,776
Fringe Benefits <sup>3</sup>	--	--	--	--	--	--	--	23,151	24,185	25,266
Fire Truck <sup>4</sup>	--	--	--	--	--	--	--	84,000	3,000	3,000
Total								\$166,755	\$ 89,453	\$ 93,318
	11	12	13	14	15	16	17	18	19	20
Captain <sup>2</sup>	\$17,232	\$ 18,024	\$ 18,876	\$ 19,752	\$ 19,752	\$ 19,752	\$ 20,664	\$ 20,664	\$ 20,664	\$ 21,649
Fire Apparatus Operator <sup>2</sup>	14,424	15,072	15,756	16,488	16,488	16,488	17,232	17,232	17,232	18,024
Firefighter <sup>2</sup>	36,288	37,908	39,636	41,364	41,364	41,642	43,272	43,272	43,272	45,216
Fringe Benefits <sup>3</sup>	26,389	27,578	28,846	30,141	30,141	30,141	31,525	31,526	31,526	32,970
Fire Truck <sup>4</sup>	3,000	3,000	3,000	3,000	3,000	3,000	3,000	84,000	3,000	3,000
Total	\$97,333	\$101,582	\$106,114	\$110,745	\$110,745	\$111,023	\$115,693	\$196,694	\$115,694	\$120,859

<sup>1</sup>Year 1 represents the 1977-78 fiscal year.

<sup>2</sup>The salaries are based on the Kauai Fire Department's present salary schedule (July 1, 1975).

<sup>3</sup>Fringe benefits were estimated to be 38.84% of the salary figures based on a rate obtained from the Department of Finance, County of Kauai. This percentage excludes FICA contributions.

<sup>4</sup>Estimated cost of a new pumper truck is \$81,000 with annual operating expenses estimated to be \$3,000. The pumper truck is replaced after a 10-year period.

TABLE IV-21

KAUAI FIRE DEPARTMENT ACTIVITY<sup>1</sup>

<u>Kauai</u>	<u>1970</u>	<u>1975<sup>2</sup></u>	<u>% Change</u>
Emergency Calls <sup>3</sup>	50	211	163.75
Fire Alarms	266	351	31.95
Fire Losses	\$417,314	\$1,343,351	221.90
<u>Koloa-Poipu</u>			
Emergency Calls <sup>3</sup>	12	26	116.67
Fire Alarms	35	63	80.00
Fire Losses	\$345,979	\$360,050	4.07

<sup>1</sup>Kauai Fire Department, Lihue, August 13, 1975.

<sup>2</sup>July 1, 1974 through June 30, 1975.

<sup>3</sup>Emergency calls: Auto accidents and wash downs, heat/oxygen aid, land rescue/manpower and helicopter, ocean rescue/manpower and helicopter, auto deaths, false alarms, miscellaneous.

d. Sewer

The Koloa-Poipu area has no public sewer system. Improvements in the sewer facilities will be necessary to bring the area into compliance with the standards set by the Environmental Protection Agency. The Moana Corporation has developed a private tertiary sewage treatment facility. Also, Moana, Island Holidays, and Ohbayashi-Gumi plan to develop a subregional sewage facility to handle the needs of the proposed Moana Project and other developments, in which case public funds to develop sewage treatment facilities would not be required. A comprehensive discussion of sewerage treatment, as it relates to the Moana Project, will be forthcoming in an infrastructure plan currently under preparation by Belt, Collins and Associates, Ltd. of Honolulu.

e. Parks and Recreation

Present recreation facilities in the Koloa-Poipu area consist of the Koloa Park, Poipu Beach Park, and Kukuiula Small Boat harbor. The park in Koloa, covering 8± acres is owned by the County with various recreational facilities such as playground equipment, athletic field, etc. The county beach park at Poipu occupies a 3+ acre site, of which 11,000 square feet were recently added. The primary emphasis at Poipu Beach Park is beach recreation. Kukuiula Small Boat Harbor, the other recreational facility, is tentatively scheduled for future expansion of its facilities. According to the Kauai Parks and Recreation Department, other areas of expansion or improvement include Prince Kuhio Park and Spouting Horn Park.

Part of the proposed Moana Project includes dedication of 20 acres to the County to expand the beach park at Poipu. Intended use of this dedicated land would be for passive recreation.

This would include picnic tables, pavilions, park and open space. According to the Parks and Recreation Department, development costs of the dedicated land are estimated to be \$500,000, with maintenance costs of approximately \$10,000 annually. This expenditure by the County is assumed to be a public cost associated with the development of the Moana Project.

With the proposed dedication by the Moana Corporation, the Kauai Subdivision Ordinance's park space requirements are analyzed. The park space requirements for R-3 and R-10 density districts are 450 and 320 square feet, respectively. Applying these figures to the study area:

R-3	450 sq.ft. per unit x 300	= 135,000
R-10	320 sq.ft. per unit x 1,150	= <u>368,000</u>
		503,000 = 11.55 acres

The required 11.55 acres of park space will be more than adequately satisfied by the dedication of the 20 acres to the County of Kauai.

Tables IV-22 and IV-23 analyze the future parks and recreation situation in the Koloa-Poipu area. There currently are deficits in both the Koloa-Poipu area and Kauai County as a whole in the number of public tennis courts, beach camping sites, and boat moorages. The requirements are derived from the draft State Comprehensive Outdoor Recreation Plan, SCORP Report, prepared for the Department of Planning and Economic Development by Aotani and Hartwell Associates, Inc., Honolulu, July, 1975. The recreation requirements were developed with the cooperation of the Kauai County Parks and Recreation Department.

TABLE IV-22

KAUAI OUTDOOR RECREATION PLAN<sup>1</sup>

Activity	1975 Supply	Unit of Measure	1975		1980		1990	
			Require- ments	Deficit/ Excess	Require- ments	Deficit/ Excess	Require- ments	Deficit/ Excess
Swimming/Sunbathing, Beach	75.60	Acres	14.18	61.42+	17.48	58.12+	22.19	53.51+
Swimming/Sunbathing, Pool	0.28	Acres	0.17	0.11+	0.18	0.10+	0.21	0.07+
Tennis, Public	12.00	Courts	14.05	2.05-	15.13	3.13-	17.40	5.40-
Tennis, Private	31.00	Courts	4.19	26.81+	4.92	26.08+	6.86	24.14+
Camping, Beach	362.00	Sites	486.50	124.50-	533.00	171.00-	657.50	295.50-
Camping, Inland	99.00	Sites	4.00	95.00+	5.25	93.75+	7.50	91.50+
Picnicking, Beach Park	131.66	Acres	77.84	53.82+	84.75	46.91+	102.19	29.47+
Picnicking, Inland	51.15	Acres	0.45	50.70+	0.49	50.66+	0.66	50.49+
Golf	4.00	Courses	1.80	2.20+	2.13	1.87+	2.87	1.14+
Hiking	117.40	Miles	12.10	105.30+	13.07	104.33+	15.49	101.91+
Boat Launching	11.00	Lanes	4.70	6.30+	5.21	5.79	6.69	4.31+
Boat Moorages	86.00	Moorages	166.75	80.75-	193.50	107.50-	246.75	160.75-
Active Games	151.30	Acres	20.57	130.73+	22.53	128.77+	27.28	124.02+

<sup>1</sup>Draft State Comprehensive Outdoor Recreation Plan, prepared for the Department of Planning and Economic Development, by Actani and Hartwell Associates, Inc., July, 1975.

TABLE IV-23  
 KOLOA-POIPU AND KALAHEO-KEKAHA OUTDOOR RECREATION PLAN<sup>1</sup>

Activity	1975			1975			1980			1990		
	Supply	Unit of Measure	Requirements	Deficit/Excess	Requirements	Deficit/Excess	Requirements	Deficit/Excess	Requirements	Deficit/Excess		
Swimming/Sunbathing, Beach	37.64	Acres	4.17	33.47+	4.90	32.74+	5.90	31.74+	5.90	31.74+		
Swimming/Sunbathing, Pool	0.21	Acres	0.06	0.15+	0.06	0.15+	0.07	0.14+	0.07	0.14+		
Tennis, Public	8.00	Courts	9.76	1.76-	10.34	2.34-	11.55	3.55-	11.55	3.55-		
Tennis, Private	7.00	Courts	0.15	6.85+	0.18	6.82+	0.25	6.75+	0.25	6.75+		
Camping, Beach	170.00	Sites	275.50	87.50-	273.25	103.25-	305.00	135.00-	305.00	135.00-		
Picnicking, Beach Park	35.46	Acres	19.93	15.54+	21.16	14.30+	23.70	11.76+	23.70	11.76+		
Picnicking, Inland	50.55	Acres	0.41	50.14+	0.45	50.10+	0.60	49.95+	0.60	49.95+		
Golf	0.50	Courses	0.20	0.30+	0.24	0.26+	0.33	0.17+	0.33	0.17+		
Hiking	66.70	Miles	7.96	58.74+	8.99	57.71+	9.43	57.27+	9.43	57.27+		
Boat Launching	4.00	Lanes	1.42	2.58+	1.54	2.46+	1.85	2.15+	1.85	2.15+		
Boat Moorages	57.00	Moorages	58.50	1.50-	65.00	8.00-	76.25	19.25-	76.25	19.25-		
Active Games	82.45	Acres	10.60	71.85+	11.26	71.19+	12.50	69.96+	12.50	69.96+		

<sup>1</sup> Draft State Comprehensive Outdoor Recreation Plan, prepared for the Department of Planning and Economic Development, by Aotani and Hartwell Associates, Inc., July, 1975.

According to the SCORP report, the Koloa-Poipu area in the near future will require two additional public tennis courts as an addition to the existing courts located in Koloa town. Their development cost is estimated at \$30,000 to \$35,000, with operating and maintenance costs of approximately \$300 per month. The development plans for the Moana Project include a tennis court complex (nearly completed). Hence, the excess demand for the limited County facilities should not be exacerbated as a result of the project. To the contrary, since the Moana facility will be open to the public for a slight user charge, the project should help alleviate the excess of demand over supply for public facilities.

Although the SCORP report lists a deficit in beach camping sites for the Koloa-Poipu area, the Parks and Recreation Department does not plan additional sites in the area. Beach camping activities are not a desired use for the area due to their associated operational problems.

The area of boat moorages is another deficit listed in the SCORP report. The (tentative) expansion of the Kukuiula Small Boat Harbor is scheduled in the future with or without the development of the Moana Project. The estimated growth in the Koloa-Poipu area should be adequately served by the scheduled improvements.

Golf courses are another area in which the SCORP report lists a possible problem area in the future. The proposed 18-hole golf public golf course of the Moana Project should adequately serve the public needs for the area.

In the future, parks and recreation needs for the Koloa-Poipu area can be expected to be sufficiently served in the eventuality of the Moana Project. However, the County's development costs

of the dedicated park land should be considered as a public cost. Although the land is being dedicated, the County of Kauai will have to develop the property in order for the public to utilize it as park and recreation space. This County expenditure is a direct result of the Moana Project, to be considered along with the fact that the dedication is a direct benefit.

Other Public/Private Service Expenditures

a. Water

The Koloa-Poipu area currently is served by two deep wells mauka of Koloa town, transmission mains of various sizes, and the PANAU tank which has a 250,000 gallon capacity. The ability of the present water system to handle the increase in demand created by the Moana Project depends primarily on three factors: water source, water transmission mains, and storage facilities. The Kauai County Department of Water states that the present water source facilities are not able to handle the heavy additional demand of the proposed development, since the capacity of the present supply facilities already is nearly reached. Also, the present transmission mains are not adequate for the delivery of the required fire flow plus maximum day demand flows. Concerning the inadequacy of the present storage facilities, under their 6-year CIP, a one million gallon storage tank is envisioned (PUUHI tank).

Possibly a cooperative effort among the various developers with the water department will be required in order to ensure the needed additional water supply for the Koloa-Poipu area. Tentative funding from the State of Hawaii to develop the needed water source will include \$700,000. Once the source

is developed, the operations and maintenance costs of providing the water are almost self-supporting. The \$700,000 water source development expenditure by the State is considered a direct cost of the project and other proposed projects which will draw upon the source.

A comprehensive description of the impacts of the Moana Project on the Koloa-Poipu infrastructure currently is being prepared by Belt, Collins and Associates, Ltd. of Honolulu.

b. Education

Koloa Elementary School is located 1-2 miles from the project site. The high school students attend Kauai High School in Lihue, and Kauai Community College in Lihue is available for junior college students. Starting in the 1977-78 school year, grades 7 and 8 at Koloa Elementary School will begin attending Kauai High School. Current expansion of the education facilities for the Koloa-Poipu area include a community-school library, administrative building, four additional classrooms, and a cafeteria-auditorium. The additions to Koloa Elementary School should be completed by October, 1975.<sup>1</sup> Also, a new campus for Kauai Community College is under construction and is scheduled for completion by the 1976-77 school year.

Table IV-24 shows the estimated annual number of school children generated by the completed Moana Project. For the purpose of estimating the number of elementary and secondary school students, enrollment factors generated by the State Department of Education are used. These factors determine the number of children attending school on the basis of housing unit type and income level. It is assumed that only the net resident population

---

<sup>1</sup>This analysis acknowledges the November, 1973 fire occurring at Koloa Elementary School and the resultant building and property damage.

TABLE IV-24

ESTIMATED SCHOOL ENROLLMENT AS A RESULT OF THE MOANA PROJECT<sup>1</sup>

<u>Grade</u>	<u>Single-Family Units (Net resident population, 180 units)</u>	<u>Total School Children Generated</u>
K- 6	180 x 0.50 =	90
7- 8	180 x 0.15 =	27
9-12	180 x 0.20 =	36
13-14	-- <sup>2</sup>	<u>9</u>
TOTAL		162

<sup>1</sup>McDonald & Smart, Inc.

<sup>2</sup>Kauai Community College.

of Kiahuna will contribute to an increase in the student population on Kauai. The students of the current resident population already are accounted for in the DOE's expenditure for the County of Kauai, and it is assumed that the non-resident population of the project will not generate any additional students to be educated at the expense of the State of Hawaii. Table IV-25 shows the estimated per pupil cost based on average enrollment by cost categories.

The school enrollment at Koloa Elementary School is shown on Table IV-26. Because of the declining school enrollment and the recent expansion in the educational facilities, the net impact on the educational capacity of Kauai as a result of the project is not expected to be significant. However, there are certain expenditure categories that will be affected as a result of the additional students from the Moana Project. Table IV-27 shows these cost categories to be attendance and health services, pupil transportation, and food service. The other cost categories are not considered to be affected by the increase in students. For example, previous declining enrollment in the Koloa-Poipu area and the present expansion of the present facilities should enable the projected Moana Project students to be assimilated into the system at no increase in the number of teachers or additional capital outlay.

Table IV-28 projects the estimated number of students generated by the Project during the development period. Also, the corresponding per pupil education expenditures are calculated.

c. Library

The Koloa-Poipu area will be served by the new community-school library in Koloa, slated for completion in October, 1975. The facility will have approximately 20,000 volumes. Five full-time

TABLE IV-25

PER PUPIL COST BASED ON AVERAGE  
ENROLLMENT BY COST CATEGORIES<sup>1</sup>

<u>Cost Categories</u>	<u>1969-70</u>	<u>1973-74</u>	<u>% Change</u>
Administration	\$ 50.87	\$ 66.77	31.26
Instruction	538.89	783.79	45.45
Attendance and Health Service	11.81	36.15	206.10
Pupil Transportation	13.87	21.48	54.87
Operation of School Plants	26.92	54.45	102.27
Maintenance of School Plants	38.64	32.77	- 15.19
Fringe Benefit Costs	70.19	162.80	131.94
Food Services	67.00	99.19	48.04
Capital Outlay	<u>175.62</u>	<u>190.48</u>	<u>8.46</u>
Total	\$993.81	\$1,447.88	45.69
Average Daily Enrollment	179,364	176,494	- 1.60

<sup>1</sup>Financial Report on Operating and Capital Improvement Project Funds, Department of Education, State of Hawaii, 1974.

TABLE IV-26

KOLOA ELEMENTARY SCHOOL ENROLLMENT<sup>1</sup>

<u>Grade</u>	<u>1970-71</u>	<u>1974-75</u>	<u>% Change</u>
K	47	46	- 2.13
1	61	57	- 6.56
2	61	44	127.87
3	54	51	- 5.56
4	60	37	- 38.33
5	53	56	5.66
6	57	50	- 12.28
7 <sup>2</sup>	61	51	- 16.39
8 <sup>2</sup>	<u>60</u>	<u>56</u>	<u>- 7.14</u>
TOTAL	514	448	- 12.84

<sup>1</sup>Department of Education, State of Hawaii.

<sup>2</sup>Seventh and eighth grades in Koloa will go to Kauai High School beginning with the 1977-78 school year.

TABLE IV-27

ESTIMATED PER PUPIL EXPENSES EFFECTED BY THE MOANA PROJECT<sup>1</sup>

<u>Cost Categories</u>	<u>1973-74</u>
Administration	-- <sup>2</sup>
Instruction	-- <sup>2</sup>
Attendance and Health Service	\$ 36.15
Pupil Transportation	21.48
Operation of School Plants	-- <sup>2</sup>
Maintenance of School Plants	-- <sup>2</sup>
Fringe Benefit Costs	-- <sup>2</sup>
Food Service	99.19
Capital Outlay	<u>--<sup>2</sup></u>
Total	\$156.82

<sup>1</sup>McDonald & Smart, Inc.

<sup>2</sup>Per pupil expense not considered to be directly related to the Moana Project.

TABLE IV-28

ESTIMATED INCREASE IN EDUCATION COSTS AS A RESULT OF THE MOANA PROJECT<sup>1</sup>

	Years <sup>2</sup>									
	1	2	3	4	5	6	7	8	9	10
School Enrollment <sup>3</sup>	2	6	13	22	32	43	54	65	76	86
Annual Expenditure for Increased Enrollment	\$ 314	\$ 941	\$ 2,038	\$ 3,450	\$ 5,018	\$ 6,743	\$ 8,468	\$ 10,193	\$ 11,918	\$ 13,487
School Enrollment <sup>3</sup>	11	12	13	14	15	16	17	18	19	20
Annual Expenditure for Increased Enrollment	\$ 97	\$ 108	\$ 119	\$ 130	\$ 140	\$ 149	\$ 156	\$ 160	\$ 162	\$ 162
School Enrollment <sup>3</sup>	\$ 15,212	\$ 16,937	\$ 18,662	\$ 20,387	\$ 21,955	\$ 23,366	\$ 24,464	\$ 25,091	\$ 25,405	\$ 25,405

<sup>1</sup>McDonald & Smart, Inc.

<sup>2</sup>Year 1 represents the 1977-78 fiscal year.

<sup>3</sup>Rounded to nearest whole number.

staff members will be employed there. According to the Regional Librarian for Kauai, the planned library in Koloa will be operating at levels below capacity with the development of the Moana Project.

d. Health Care

Kauai's health care needs are served by 42 physicians/surgeons and 20 dentists. Kauai's "doctor to general population" ratio is 1:743 relative to the State's ratio of 1:733.<sup>1</sup> There are three hospitals located in Kauai. Of health services available specifically in the Koloa-Poipu area, there are the Koloa Dispensary and the Kauai Medical Group. Ambulance service to the area is provided by Pacific Ambulance Service which is contracted to the State of Hawaii.

The occupancy rates of the two island hospitals offering general services, Kauai Veterans Memorial and Wilcox Memorial, during 1973 were 50% and 58%, respectively. Kauai Veterans Memorial related that their present occupancy rate was 43%, and Wilcox Memorial stated that their present occupancy rate was approximately 50%. The proposed Project should have no significant impact on the level of hospital services currently available to the residents of Kauai. (See Table IV-29.)

Currently, ambulance service to the Koloa-Poipu area is provided by Pacific Ambulance Service which operates out of Lihue. The service operates under a contract with the State of Hawaii. Their response time to the Koloa-Poipu area is approximately 20 to 30 minutes, depending upon the location. Pacific Ambulance

---

<sup>1</sup>Statistical Report, Department of Health, State of Hawaii, 1973.

TABLE IV-29

HOSPITAL FACILITIES BY HOSPITAL, LOCATION, OCCUPANCY, AND PATIENT DAYS, 1973<sup>1</sup>

	Type	Location	Ownership	Beds	Per Cent Occupancy	Annual Patient Days
Kauai Veterans Memorial	General	Waimea	State	48	50	8,099
G.N. Wilcox Memorial	General	Lihue	NPA	85	58	18,062
G.N. Wilcox Memorial	Long-Term	Lihue	NPA	75	66	18,109
Samuel Mahelona Memorial	Mental	Kapaa	State	72	40	12,550
Samuel Mahelona Memorial	TB	Kapaa	State	12	17	765
Samuel Mahelona Memorial	Long-Term	Kapaa	State	22	96	7,744

<sup>1</sup>Statistical Report, Department of Health, State of Hawaii, 1973.

Service feels that with a development the size of the Moana Project, an ambulance station in the Koloa area would be necessary. This would increase the contract bid to the State of Hawaii approximately \$25,000 a year. It is estimated that this addition would be necessitated around the seventh year of the development period.

e. Electricity

Electrical service to the Koloa-Poipu area is provided by the Kauai Electric Company, a division of the Citizens Utility Company. According to Kauai Electric, the proposed Moana Project is not expected to place excessive demands on Kauai's total energy system, provided that development occurs in an orderly manner. For a more comprehensive analysis of the Project's impact on Kauai's electrical system, refer to the infrastructure plan currently in progress by Belt, Collins and Associates, Ltd., Honolulu.

f. Gas

Gas or propane gas made available by Isle Gas Division of Gasco, Inc. in cylinders or on a bulk-tank basis is used by 70% of the households on Kauai. Propane gas also is available through a community feeder system provided by community systems in Kekaha and Lawai. (Gas prices are directly affected by the price of crude oil and liquid propane gas purchased from foreign suppliers. Kauai receives gas from manufacturers on Oahu and from foreign sources, such as Venezuela.) According to Gasco, they will be able to provide adequate services to the proposed project barring any unforeseen circumstances.

g. Telephone

Telephone service to the Koloa-Poipu area is provided by the Hawaiian Telephone Company. The Hawaiian Telephone Company relates that full telephone service could be provided to the proposed development without a reduction in the quality and level of service now maintained.

Public Expenditure Summary

Table IV-30 and IV-31 show both the major public and private expenditures realized as a result of the Moana Project. We investigated the major expenditure categories directly affected by the project.

REVENUE-EXPENDITURE SUMMARY

No Project Alternative

Table IV-32 presents the revenues and expenditures realized by the County if no development were to occur on the Knudsen Trusts in the Koloa-Poipu area. The cumulative difference under the no project alternative is estimated to be \$453,120 over the 20-year development period. The primary revenue sources are taxes on real property. Although certain public services do indeed provide services to the Knudsen Trusts under consideration, such as fire protection, the land is assumed to incur no public service expenditures for the purpose of this analysis.

Moana Project Alternative

Table IV-33 shows the associated revenues and expenditures of the Moana Project alternative. At the end of the development period, the cumulative difference between the County's revenues and expenditures is estimated to be \$12,446,632. Subtracting the no project alternative net revenue from the Moana Project alternative net revenues yields \$11,993,512.

TABLE IV-30  
 ESTIMATED COUNTY OF KAUAI PUBLIC EXPENDITURES AS A RESULT OF THE MOANA PROJECT<sup>1</sup>  
 (In Dollars)

	Years <sup>2</sup>									
	1	2	3	4	5	6	7	8	9	10
Police	--	--	--	--	--	37,837	51,285	48,084	57,883	52,782
Fire	--	--	--	--	--	--	--	166,755	89,453	93,318
Solid Waste Disposal	--	--	--	--	--	--	--	--	--	--
Sewer	--	--	--	--	--	--	--	--	--	--
Parks and Recreation	250,000	250,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Total Annual Expenditures	250,000	250,000	10,000	10,000	10,000	47,837	61,285	224,839	157,336	156,100
Cumulative Annual Expenditures	250,000	500,000	510,000	520,000	530,000	577,837	639,122	863,961	1,021,297	1,177,397
Police	11	12	13	14	15	16	17	18	19	20
Fire	62,831	57,930	68,229	60,729	68,229	63,678	71,178	63,678	74,327	66,827
Solid Waste Disposal	97,333	101,582	106,114	110,745	110,745	110,745	115,694	196,699	115,694	120,858
Sewer	--	--	--	--	--	--	--	--	--	--
Parks and Recreation	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Total Annual Expenditures	170,164	169,512	184,343	181,474	188,978	184,423	196,872	270,377	200,021	197,685
Cumulative Annual Expenditures	1,347,561	1,517,073	1,701,416	1,882,890	2,071,868	2,256,291	2,453,163	2,723,540	2,923,561	3,121,246

<sup>1</sup>McDonald & Smart, Inc.

<sup>2</sup>Year 1 represents the 1977-78 fiscal year.

TABLE IV-31  
ESTIMATED OTHER PUBLIC/PRIVATE SERVICE EXPENDITURES AS A RESULT OF THE MOANA PROJECT<sup>1</sup>  
(In Dollars)

	Years <sup>2</sup>									
	1	2	3	4	5	6	7	8	9	10
Water	375,000	375,000	--	--	--	--	--	--	--	--
Education	314	941	2,038	3,450	5,018	6,743	8,468	10,193	11,918	13,487
Health (Ambulance Service)	--	--	--	--	--	--	25,000	25,000	25,000	25,000
Total Annual Expenditures	375,314	375,941	2,038	3,450	5,018	6,743	33,468	35,193	36,918	38,487
Cumulative Annual Expenditures	375,314	751,255	753,293	756,743	761,761	768,504	801,972	837,165	874,083	912,570
Water	11	12	13	14	15	16	17	18	19	20
Education	--	--	--	--	--	--	--	--	--	--
Health (Ambulance Service)	15,212	16,937	18,662	20,387	21,955	23,366	24,464	25,091	25,405	25,405
Total Annual Expenditures	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Cumulative Annual Expenditures	40,212	41,937	43,662	45,387	46,955	48,366	49,464	50,091	50,405	50,405
	952,782	994,719	1,038,381	1,083,768	1,130,723	1,179,089	1,228,553	1,278,644	1,329,049	1,379,454

<sup>1</sup> McDonald & Smart, Inc.

<sup>2</sup> Year 1 represents the 1977-78 fiscal year.

TABLE IV-32

NO PROJECT ALTERNATIVE - REVENUES AND EXPENDITURES<sup>1</sup>  
(In Dollars)

	Years <sup>2</sup>									
	1	2	3	4	5	6	7	8	9	10
Real Property Taxes	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656
Total Public Revenues	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656
Cumulative Revenues	22,656	45,312	67,968	90,624	113,280	135,936	158,592	181,248	203,904	226,560
Cumulative Expenditures	--	--	--	--	--	--	--	--	--	--
Real Property Taxes	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656
Total Public Revenues	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656	22,656
Cumulative Revenues	249,216	271,872	294,528	317,184	339,840	362,496	385,152	407,808	430,464	453,120
Cumulative Expenditures	--	--	--	--	--	--	--	--	--	--

<sup>1</sup>See Table V-8.

<sup>2</sup>Year 1 represents the 1977-78 fiscal year.

TABLE IV-33  
 MOANA PROJECT ALTERNATIVE - PUBLIC REVENUES AND EXPENDITURES  
 (In Dollars)

	Years <sup>1</sup>									
	1	2	3	4	5	6	7	8	9	10
Annual County Revenues <sup>2</sup>	127,543	201,514	276,487	348,181	433,350	505,475	578,294	651,151	724,009	799,097
Cumulative County Revenues <sup>2</sup>	127,543	329,057	605,544	953,725	1,387,075	1,892,550	2,470,844	3,121,995	3,846,004	4,645,101
Annual State Revenues <sup>3</sup>	44,400	44,400	44,400	44,400	88,800	88,800	88,800	88,800	88,800	88,800
Cumulative State Revenues <sup>3</sup>	44,400	88,800	133,200	177,600	266,400	355,200	444,000	532,800	621,600	710,400
Annual County Expenditures <sup>4</sup>	250,000	250,000	10,000	10,000	10,000	47,837	61,285	224,839	157,336	156,100
Cumulative County Expenditures <sup>4</sup>	250,000	500,000	510,000	520,000	530,000	577,837	639,122	863,961	1,021,297	1,177,397
Annual Other Expenditures <sup>5</sup>	375,314	375,941	2,038	3,450	5,018	6,743	33,468	35,193	36,918	38,487
Cumulative Other Expenditures <sup>5</sup>	375,314	751,225	753,268	756,718	761,736	768,479	801,947	827,140	864,058	902,545
Annual County Revenues <sup>2</sup>	872,226	942,585	1,015,443	1,088,302	1,161,160	1,163,342	1,167,357	1,169,945	1,171,111	1,170,851
Cumulative County Revenues <sup>2</sup>	5,517,327	6,459,912	7,475,355	8,563,657	9,724,817	10,888,159	12,055,516	13,225,461	14,396,572	15,567,423
Annual State Revenues <sup>3</sup>	88,800	88,800	88,800	88,800	88,800	88,800	88,800	88,800	88,800	88,800
Cumulative State Revenues <sup>3</sup>	799,200	888,000	976,800	1,065,600	1,154,400	1,243,200	1,332,000	1,420,800	1,509,600	1,598,400
Annual County Expenditures <sup>4</sup>	170,164	169,512	184,343	181,474	188,978	184,423	196,872	270,377	200,021	197,685
Cumulative County Expenditures <sup>4</sup>	1,347,561	1,517,073	1,701,416	1,882,890	2,071,868	2,256,291	2,453,163	2,723,540	2,923,561	3,121,246
Annual Other Expenditures <sup>5</sup>	40,212	41,937	43,662	45,787	46,955	48,366	49,464	50,091	50,405	50,405
Cumulative Other Expenditures <sup>5</sup>	942,757	984,694	1,028,356	1,074,143	1,121,098	1,169,464	1,218,928	1,269,019	1,319,424	1,369,829

<sup>1</sup>Year 1 represents the 1977-78 fiscal year. <sup>2</sup>See Table V-12. <sup>3</sup>See Table V-13. <sup>4</sup>See Table V-30. <sup>5</sup>See Table V-31, Other Public/Private Expenditures.

Hence, if the no project alternative is decided upon, the opportunity cost to the County of Kauai is \$11,993,512 at the end of the development period. This figure represents the net estimated revenues (i.e., amount of public revenues in excess of public costs) that the County would have realized if the Moana Project were developed according to the buildout schedule and accompanying assumptions. As the time horizon under consideration is expanded beyond the 20-year development period, this opportunity cost of not building the project increases.

#### SUMMARY OF THE ANALYSIS

Presently, the Knudsen Trusts in the Koloa-Poipu area generate \$22,656 annually in property tax revenues to the county. The cumulative net revenues (revenues minus expenditures) realized by the County under the "no project alternative" at the end of the 20-year development period are \$453,120.

The cumulative revenues realized by the County of Kauai under the "Moana Project Alternative" at the end of the 20-year development period are \$15,567,423, the public expenditures are \$3,121,246, and the cumulative net revenues (revenues minus expenditures) are \$12,446,177.

Cumulative excise tax and personal income tax revenues to the State as a result of the Kiahuna project are \$5,353,363 at the end of the development period.

Cumulative public expenditures by the State for water, education, and health services as a result of the Moana Project are \$1,369,829 at the end of the development period.

## COMMENTS

### Public Revenues

As in any analysis of this kind, certain basic assumptions have to be made which seldom are borne out exactly in the course of actual development. The objective, then, is to work from assumptions which, based on experience, are thought to reasonably represent likely futures at a level of accuracy sufficient to permit decisions to be made. A satisfactory level of accuracy is one in which the actuality does not deviate from the assumption to such a degree that, had the decision-makers been able to predict actuality, he would have made a different decision. The most critical assumption made in developing the estimates of the public revenues from the proposed development was the estimated buildout schedule provided by Moana Corporation, and independently confirmed as realistic by our market analysis.

The buildout schedule was formulated with the intent that it would be realized over the defined development period and at the projected rate. Realistically, it is unlikely that the schedule will be exactly realized; but the magnitude and direction of the actual results should not differ materially from the schedule and the analysis derived therefrom.

This analysis only investigated the major revenue categories. This omission would tend to bias the revenue estimates downward. Hence, our estimate of net revenue that can be realized by the County is conservative.

### Public/Private Service Expenditures

In analyzing the expenditures associated with the Moana Project, we contacted the responsible public and/or private officials to see how their budgeted expenditures would react to the proposed development. The alternative to this method would be to use average per capita figures.

Determining the incremental or marginal costs associated with the project is more difficult, but more realistic, in describing actual project impacts. Applying average per capita expenditures for all service categories would in many cases grossly misrepresent the actual associated costs of the project. For instance, even a large project of the magnitude of the Moana Project should not be expected to increase general government expenditures, but it surely is going to increase the public expenditures associated with police and fire protection. To estimate public expenditures for increased legislative and safety (police and fire) services solely on a per capita basis would in all probability overestimate the associated general government expenditures and underestimate the associated safety expenditures, depending, of course, on their respective present capacity service levels.

In analyzing the Moana Project, the responsible officials were asked to comment on how they expected the proposed development to affect their current levels of services. Then they were asked what increased expenditures would be necessary to provide the same level of public services currently available to the new project while maintaining that level for the community at large. This approach assumes that the current level is adequate. The level of adequacy is a value judgment that is dependent upon the elected public officials who allocate the public funds at budget time. The project's effect on the present levels of services was the concern of this report. The extent to which the current prevailing levels are adequate was not investigated.

Only public services were considered which were assumed to be project-related, i.e., those services whose level would be affected by the Moana Project. There were other categories, such as electric and telephone services, that were assumed to be covered by user charges.

#### Results of the Analysis

The "Public Expenditure Summary" (p. 128) summarizes the major findings of this report. On the County level, the results are fairly complete. Cumulative net revenues realized by the County are \$12,446,177. On the State level, gross excise taxes and State personal income taxes were the only State revenue sources investigated. The State receives income taxes on both direct income changes and indirect income generated through the economic multiplier process. An estimate of the employment and income changes resulting from the Moana Project were developed in the section on Moana Project private sector income and employment analysis. The research tool to investigate the primary and secondary income effects was an input-output model.

The way in which these public revenues and expenditures relate to the County's future overall fiscal status are shown in Table IV-34. According to the County's 6-year financial projection, the excess of estimated County expenditures over revenues is expected to increase in the future. If the Federal revenue-sharing program is not renewed when it expires in 1976 or State grants-in-aid do not increase (they are not anticipated to vary from the present fixed amount) in the future, the County of Kauai is expected to incur a persistent deficit in the County operating budget. Even with revenue-sharing, the situation is marginal. This deficit will have to be cured by either decreasing public expenditures, increasing public revenues, or borrowing

TABLE IV-34

COUNTY OF KAUAI SIX-YEAR FINANCIAL PROJECTION  
FOR FISCAL YEARS 1975-1976 THROUGH 1980-1981<sup>1</sup>  
(In Dollars)

	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
Estimated Revenue						
Taxes	7,037,950	7,822,850	8,693,000	9,655,850	10,736,000	11,946,000
Licenses and Permits	754,800	746,800	766,000	789,000	820,000	855,000
Use of Money and Property	741,600	749,200	750,000	700,000	660,000	635,000
Other Agencies	3,238,028	3,239,146	3,241,000	3,242,000	3,244,000	3,245,000
Charges for Current Services	326,550	338,100	353,000	362,000	384,000	391,000
Charges to Other Funds	126,586	140,600	148,000	145,000	150,000	160,000
Other Revenues	69,300	76,500	81,000	90,000	105,000	112,000
Total Estimated Revenue	12,294,814	13,113,196	14,032,000	14,983,850	16,099,000	17,344,000
Estimated Expenditures						
Legislative Functions	305,659	400,318	440,349	484,383	532,821	586,103
Management and Other Services	2,320,637	2,570,661	2,827,727	3,110,499	3,421,548	3,763,702
Public Safety	3,780,922	4,291,190	4,720,309	5,192,339	5,711,572	6,282,729
Social Welfare	212,738	248,825	248,975	273,872	301,259	331,384
Highway and Equipment Maintenance	1,649,479	1,811,020	1,992,122	2,191,334	2,410,267	2,651,293
Health and Environmental Services	338,000	367,310	404,041	444,445	488,889	537,777
Parks and Recreation	1,031,914	1,147,810	1,262,591	1,388,850	1,527,735	1,680,508
Debt Service Charges	1,654,727	1,681,461	1,935,380	1,876,554	1,820,242	1,764,137
Fringe Benefits and Other Costs	2,120,492	2,170,150	2,278,657	2,392,589	2,512,218	2,637,828
Total Estimated Expenditures	13,414,568	14,688,745	16,110,151	17,354,865	18,726,551	20,235,461
Excess of Estimated Expenditures Over Revenue	1,119,754	1,575,549	2,078,151	2,371,015	2,627,551	2,891,461

<sup>1</sup> Department of Finance, County of Kauai, 1975.

funds. Presently, the County Finance Department states that this projected deficit most likely will have to be met by increasing the tax base of Kauai. The Moana Project would have a major positive impact on the tax base expansion, while requiring additional public service costs significantly lower than public revenues generated.

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

# CORRECTION

THE PRECEDING DOCUMENT(S) HAS  
BEEN REPHOTOGRAPHED TO ASSURE  
LEGIBILITY  
SEE FRAME(S)  
IMMEDIATELY FOLLOWING

•anojnozliw

funds. Presently, the County Finance Department states that this projected deficit most likely will have to be met by increasing the tax base of Kauai. The Moana Project would have a major positive impact on the tax base expansion, while requiring additional public service costs significantly lower than public revenues generated.

## V. PROJECT-GENERATED PRIVATE SECTOR INCOME AND EMPLOYMENT

This section analyzes the Moana Project's estimated impact upon private sector income and employment. We have analyzed both primary and secondary impacts -- i.e., jobs and income generated through direct employment by the project and jobs and income generated in the Kauai economy outside of the project but which are a result of the Project.

Based on these analyses, which are documented in the following materials, we estimate that, upon completion of the condominiums in year 15, the Moana Project will provide at least 390 permanent jobs, of which 383 will be filled by Kauai residents. Average total annual wages to be paid permanent employees are estimated at \$3,600,000.

In addition, the project will result in temporary construction employment through the 15-year period averaging 105 jobs annually. Of these 105 jobs, it is estimated that 93 will be filled by Kauai residents. Average total annual wages to be paid construction workers are \$1,300,000.

The secondary economic impacts of the Moana Project are substantial. The average wage dollar paid in Kauai gets spent 3.09 times during the year. On the average, a construction job creates 1.41 jobs throughout the County's economy, and a hotel-related job creates 1.20 jobs throughout the economy.

In analyzing the Moana Project, it is again important to compare it to a "no project alternative," which we assume to produce no jobs. Hence, the Moana Project income and employment impacts represent the difference between the Moana Project alternative and the no project alternative (which assumes the lack of equivalent new job and income generating projects elsewhere).

As subsequently documented in this section, the total annual economic change estimated to occur in Kauai as a result of \$1,313,250 in construction wages associated with the Moana Project is \$4,061,702. The total annual economic change estimated to occur due to the project's \$3,637,600 in tourist activity wages is \$11,250,597.

The annual project permanent employment wage -- which ranges from \$811,185 in year 1 to \$3,637,600 beginning in year 15 -- is estimated to generate total economic changes which range from \$2,508,883 in year 1 to \$11,250,597 in year 15 and thereafter.

Hence, the total gross annual economic change ranges from \$8,695,020 in year 1 to \$20,263,149 in year 15. Thereafter, it declines (because of termination of construction) and remains at \$14,888,197 annually.

#### KAUAI COUNTY POPULATION, INCOME, AND EMPLOYMENT

##### Population

Table V-1 describes selected population characteristics for Kauai's resident population and also for the Koloa-Poipu area, Census Tract 406. The data were collected and organized by the State Department of Labor and Industrial Relations from the 1970 U.S. Census of Population.

Table V-2 presents an update of selected population characteristics for Kauai and the Koloa-Poipu area.

TABLE V-1  
SELECTED POPULATION CHARACTERISTICS, 1970<sup>1</sup>

	County of Kauai		Koloa-Poipu	
	Number	Per Cent Distribution	Number	Per Cent Distribution
Population				
White	7,695	26.1	1,080	34.4
Non-White	21,779	73.9	2,061	65.6
Total	29,474	100.0	3,141	100.0
Labor Force Status				
Employed	11,856	96.3	1,362	96.5
Unemployed	456	3.7	50	3.5
Civilian Labor Force	12,312	100.0	1,412	100.0
Population 16-21 Years of Age, Not in School, Unemployed or Not in Labor Force	320	12.7	41	14.0
Class of Worker				
Wage and Salaried	9,382	79.1	1,130	83.0
Government	1,949	16.4	215	15.8
Self-Employed	480	4.1	17	1.2
Unpaid Family Worker	45	0.4	0	0
Total Workers	11,856	100.0	1,362	100.0
Industry				
Construction	827	7.0	79	5.8
Manufacturing	1,322	11.2	45	3.3
Transportation	466	3.9	70	5.1
Communication and Utilities	684	5.8	74	5.4
Wholesale Trade	240	2.0	24	1.8
Retail Trade	1,847	15.6	215	15.8
Finance, Insurance, and Real Estate	251	2.1	42	3.1
Business and Repair Services	272	2.3	19	1.4
Personal Services	1,562	13.2	277	20.3
Health Services	574	4.8	53	3.9
Educational Services	580	4.9	61	4.5
Other Professional Services	348	2.9	11	0.8
Public Administration	861	7.3	122	9.0
Other Industries	2,022	17.0	270	19.8
Total Workers	11,856	100.0	1,362	100.0

<sup>1</sup>Selected Manpower Indicators for Kauai County, Department of Labor and Industrial Relations, State of Hawaii.



TABLE V-2

SELECTED POPULATION CHARACTERISTICS, 1974<sup>1</sup>

	<u>Kauai County</u>	<u>Koloa- Poipu</u>
Resident Population	29,460	2,850
Percentage Change from 1970 Census	-0.2	-9.3
Number of Households	8,550	880
Percentage	100	10.3
Median Household Size	3.02	3.0
Median Household Income in Dollars	10,750	10,600
Median Number of Years of Adults in the Community	27.7	23.5
Adults Born on Kauai in Percentages	53.6	50.3
Sex		
Male	51.8	51.1
Female	48.2	48.9
Median Age	27.1	27.0

<sup>1</sup>Kauai Socioeconomic Profile, Center for Non-Metropolitan Planning and Development, University of Hawaii.

### Income and Employment

Table II-3 described Kauai's labor force from 1971 to 1975. These estimates, provided by the State Department of Labor and Industrial Relations, present a detailed description of the various categories in which Kauai's labor force is employed.

Table V-3 shows, by percentage breakdown, the major employment categories for Kauai's labor force. Approximately 85% of Kauai's present labor force is employed in the private sector of the economy.

### Unemployment

Table V-4 shows Kauai's unemployment rate. According to the State Department of Labor and Industrial Relations, the estimated unemployment of Kauai County as of June, 1975 was 9.6% or 1,500 persons, of the County's estimated labor force of 15,200 persons.

Table V-5 shows a comparison of the insured unemployed by employment categories from September 15 through 20 in 1973 and 1974. Of the approximately 1,175 unemployed in 1974, 393 were covered by unemployment insurance. Contract construction shows the largest number of claimants with 24.9% in 1974.

Appendix A presents the unfilled job openings by counties for January, 1975. Unfilled job openings data provide information about the employment demand and supply situation currently existing. The data are fairly comprehensive, enabling a detailed examination of unfilled job openings by exact job category.

TABLE V-3

KAUAI'S MAJOR EMPLOYER CATEGORIES,  
PER CENT OF LABOR FORCE<sup>1</sup>

<u>Employer</u>	<u>1960</u>	<u>1970</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
Service and Miscellaneous	7%	18%	16%	18%	18%
Government	12%	17%	16%	15%	15%
Trade	11%	16%	15%	15%	16%
Agriculture	25%	12%	13%	11%	10%
Manufacturing	23%	11%	13%	10%	10%
Transportation, Communication, Utilities	4%	8%	7%	7%	8%

<sup>1</sup>Labor Area Summary, Department of Labor and Industrial Relations, State of Hawaii.

TABLE V-4

KAUAI COUNTY EMPLOYMENT<sup>1</sup>

	1971	1972	1973	1974	1975			
					March	April	May	June
Civilian Labor Force	13,550	14,470	14,730	14,275	14,600	14,400	14,800	15,200
Employed	12,850	13,530	13,780	13,150	13,400	13,400	13,600	13,700
Unemployed	700	920	930	1,175	1,100	1,100	1,100	1,500
Unemployment Rate	5.2%	6.3%	6.3%	8.2%	7.9%	7.5%	7.8%	9.6%

<sup>1</sup>Department of Labor and Industrial Relations, State of Hawaii.

TABLE V-5

UNEMPLOYMENT INSURANCE CLAIMANTS BY INDUSTRY AND SEX, KAUAI<sup>1</sup>  
(September 16-22, 1973 and September 15-20, 1974)

	Total Claimants				Men				Women			
	1973		1974		1973		1974		1973		1974	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Contract Construction	103	20.8	98	24.9	103	36.8	98	42.4	--	--	--	--
Manufacturing	49	9.9	30	7.6	25	8.9	15	6.5	24	11.2	15	9.2
Transportation, Communication, Utilities	20	4.1	20	5.1	10	3.6	20	8.7	10	4.7	--	--
Wholesale and Retail Trade	98	19.8	78	19.9	44	15.7	44	14.7	54	25.1	44	27.2
Finance, Insurance, Real Estate	10	2.0	15	3.8	5	1.8	--	--	5	2.3	15	9.3
Services	147	29.7	74	18.8	59	21.1	15	6.5	88	40.9	59	36.4
All Other	68	13.7	78	19.9	34	12.1	49	21.2	34	15.8	29	17.9
Total	495	100.0	393	100.0	280	100.0	231	100.0	215	100.0	162	100.0

<sup>1</sup> Characteristics of the Insured Unemployed, 1973, State of Hawaii, Department of Labor and Industrial Relations, Research and Statistics Office, Honolulu, Hawaii, April, 1974.

Appendix B describes the occupational employment trends by employment category for the various counties. This information, along with Appendix A, provides a complete background analysis of the current employment demand and supply conditions for Kauai County.

#### KAUAI COUNTY INPUT-OUTPUT MODEL

In analyzing the total impact on Kauai's economy resulting from the Moana Project, a method was needed to show how one part of the economy relates to another. The direct or first-round effects of the proposed development are not hard to estimate. The direct wage and income effects are given in Tables V-11 and V-12 (these appear later in this section). However, now as Kauai's household sector has more money to spend, they purchase more goods and services from local businesses. These local businesses, in turn, purchase more labor and/or goods and services from other local businesses. How is the total effect of this sort of secondary economic activity measured? An input-output model is one economic tool that attempts to quantify these primary and secondary effects to attain the total gross economic effect on a local or regional economy.

A study recently completed by a group of economists from the University of Hawaii developed an input-output model for the County of Kauai. The input-output model was a portion of the Kauai Socioeconomic Profile published in May, 1975, by the University of Hawaii's Center for Non-Metropolitan Planning and Development. Using their input-output model, the direct and indirect effects of the Moana Project are analyzed. But first, this portion of the report will briefly describe the model developed in the Kauai Socioeconomic Profile and its underlying assumptions.

The following is a brief overview of the components making up the Kauai County input-output model:

- Transactions table, Table V-6, exhibits the dollar flow of purchases and sales among the economic sectors within the County of Kauai.
- The technical coefficient table, Table V-7, presents the cost structure of each individual sector.
- The interdependence table, Table V-8, displays the area resulting from economic changes occurring in the sector.

#### Assumptions of the Kauai Input-Output Model

There are several assumptions built into the input-output method. For most input-output models, including the Kauai County input-output model, the same general assumptions apply:

a. Linear sector production functions. Each sector's column in the technical coefficient table (Table V-7) represents that sector's production function. As total sales of a sector change, it is assumed that the same proportion of the input factors remain constant. For example, if wage costs were X% of total sales before an increase in the sales of a sector, wage costs are assumed to remain at X% of total expenditures after the increase in total sales.

b. Homogeneous sector components. The economic units grouped together into a sector are assumed to possess the same linear sector production function and similar purchase and sales patterns.



TABLE V-7  
 TECHNICAL COEFFICIENT TABLE, KAUAI, 1973<sup>1</sup>

Sector Titles	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) Sugar and sugar processing	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(2) Livestock	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(3) Forestry, fishing products	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(4) Other agricultural products	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(5) Food processing and manufacturing	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(6) Non-food processing and manufacturing	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(7) Building construction	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(8) Heavy and special trade contractors	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(9) Transportation	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(10) Communication and utilities	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(11) Wholesale trade	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(12) Eating and drinking places	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(13) Retail food stores	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(14) Auto dealers, service stations, and auto repairs	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(15) Apparel and accessory stores	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(16) Furniture, home furnishings and equipment stores	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(17) Building materials	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(18) Miscellaneous retail stores	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(19) Finance, insurance, real estate	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(20) Hotels	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(21) Business services	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(22) Amusement and recreation services	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(23) Personal services	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(24) Other services	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(25) Non-classifiable establishments	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(26) Tourist transportation	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(27) Tourist gifts and souvenirs	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(28) Tourist entertainment	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(29) County government	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(30) Household	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

<sup>1</sup>Kauai Socioeconomic Profile, Center for Non-Metropolitan Planning and Development, University of Hawaii.

TABLE V-8  
INTERDEPENDENCE TABLE, KAUAI, 1973<sup>1</sup>

Sector	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) Paper and super processing	0.000132	0.004855	0.000156	0.000127	0.000148	0.000237	0.000129	0.000191	0.000164	0.000091	0.000212	0.000235	0.000215
(2) Forestry	0.011245	0.009328	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127
(3) Other agricultural products	0.006704	0.007016	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127
(4) Food processing and manufacturing	0.000001	0.004502	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127
(5) Non-food processing and manufacturing	0.010945	0.007459	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127
(6) Building construction	0.015950	0.009328	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127
(7) Heavy and special trade contractors	0.024652	0.019177	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127
(8) Transportation	0.021474	0.013586	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127
(9) Communication and utilities	0.012110	0.013586	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127	0.000127
(10) Wholesale trade	0.137953	0.373772	0.114390	0.119714	0.229320	0.123653	0.156453	0.170534	0.091117	0.272879	1.212196	0.166758	0.166758
(11) Eating and drinking places	0.016796	0.455790	0.001319	0.027560	0.031539	0.010875	0.021526	0.048271	0.021826	0.027718	0.027872	0.012103	0.012103
(12) Retail food stores	0.119404	0.082529	0.005926	0.101594	0.108947	0.108947	0.121110	0.156354	0.071549	0.090749	0.074975	0.081460	0.081460
(13) Auto dealers, service stations, and auto repairs	0.037480	0.051953	0.010737	0.120742	0.120742	0.052749	0.181319	0.181319	0.071143	0.071143	0.071143	0.051489	0.051489
(14) Apparel and accessory stores	0.037480	0.051953	0.010737	0.120742	0.120742	0.052749	0.181319	0.181319	0.071143	0.071143	0.071143	0.051489	0.051489
(15) Furniture, home furnishings and equipment stores	0.018164	0.013035	0.001010	0.019564	0.020376	0.005456	0.019925	0.023563	0.011759	0.015250	0.005129	0.012078	0.012078
(16) Building materials	0.039148	0.028250	0.001920	0.050844	0.026243	0.010680	0.155242	0.060243	0.027622	0.027622	0.007245	0.012645	0.012645
(17) Miscellaneous retail stores	0.021152	0.010591	0.023515	0.021942	0.021942	0.091491	0.025348	0.013734	0.015250	0.015250	0.007245	0.009639	0.009639
(18) Finance, insurance, real estate	0.001180	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(19) Hotels	0.001180	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(20) Business services	0.016153	0.001453	0.003751	0.018437	0.054473	0.021491	0.014101	0.014101	0.021491	0.021491	0.007810	0.014101	0.014101
(21) Amusement and recreation services	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(22) Educational services	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(23) Non-classifiable establishments	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
(24) Tourist transportation	0.000337	0.000232	0.000016	0.000242	0.000301	0.000098	0.000391	0.000413	0.000209	0.000209	0.000001	0.000201	0.000104
(25) Tourist gifts and souvenirs	0.000337	0.000232	0.000016	0.000242	0.000301	0.000098	0.000391	0.000413	0.000209	0.000209	0.000001	0.000201	0.000104
(26) Tourist entertainment	0.001180	0.001395	0.000963	0.001402	0.001528	0.001859	0.001859	0.001859	0.001859	0.001859	0.001859	0.001859	0.001859
(27) County government	0.021211	0.005490	0.005490	0.015245	0.009289	0.009289	0.009289	0.009289	0.011032	0.011032	0.005168	0.005132	0.005132
(28) Household	0.637248	0.437026	0.034898	0.481873	0.519016	0.189150	0.645251	0.845274	0.392304	0.483104	0.137241	0.358429	0.203492

Kauai Socioeconomic Profile, Center for Non-Metropolitan Planning and Development, University of Hawaii.

c. Static model structure. It is assumed that the technical coefficients change slowly over time as the relative prices of the input factors, technology, and the sector's method of operation change. This enables the future use of the input-output model for analysis purposes.

d. Total revenues equal total expenditures. All revenues and expenditures for the various sectors are accounted for.

#### Transactions Table

Interpreting the entries of the Kauai County transactions table, Table V-6:

- The sales of the individual sectors are read going across each sector's row.
- The purchases of each sector are obtained by reading down each sector's column.

Looking at the first column in row 11, the wholesale trade sector, reflects the dollar purchases by the sugar and sugar processing sector for goods from the wholesale trade sector. Every other entry in the transactions table represents a sale by one sector and a purchase by another sector. These dollar transactions are for the base year 1973. At the bottom of the first column, the figure \$43,903,000 represents the sum of the sugar and sugar processing sector's total purchases. Analogously, the summation of the sugar and sugar processing sector's row entries represent the total sector sales. In 1973, the sugar and sugar processing sector's sales totaled \$43,903,000. All succeeding calculations of the Kauai County input-output model are based on the entries in the transactions table.

### Technical Coefficient Table

The technical coefficient table, Table V-7, presents each sector's individual costs as a proportion of the sector's total production. Each coefficient is derived directly from its corresponding entry in the Kauai County transactions table. These coefficients are derived by dividing the dollar amount of each sector's purchases of inputs by the sector's total dollar production.

As represented in the transactions table, the sugar and sugar processing sector purchased \$561,000 in goods from the wholesale trade sector. The corresponding entry in the technical coefficient table is 0.0127782. This figure was obtained by dividing the amount spent of \$561,000 by the sector's total purchases of \$43,903,000. The figure 0.0127782 is the proportion of the sugar and sugar processing factor's total output spent in the wholesale trade sector during the base year of 1973. Each of the coefficients in the technical coefficient table can be interpreted in a similar manner. The individual sector columns of the table represent the proportional input production functions of each sector to produce their respective outputs. Table V-7 contains the technical coefficients for sectors 1 through 30; the technical coefficients for sectors 31 through 39 are omitted from the table, as their development is not necessary for formulation of the input-output model.<sup>1</sup>

### Interdependence Table

Economic activity in one area of Kauai's economy has, to some degree, an effect upon the activity in other sectors of the

---

<sup>1</sup>Refer to Appendix I, Kauai Socioeconomic Profile.

economy. The interdependence table, Table V-3, places these relationships into perspective. The Kauai County interdependence table is derived from the data developed in the technical coefficient table. The resultant coefficients show the total amount of output required both (directly and indirectly) from each sector to deliver one dollar's worth of a given sector's output to satisfy a dollar increase in final demand or external sales.

In estimating the total effect external sales will have on the internal economy, that includes sectors 1 through 30, the appropriate column is multiplied by the change of \$X's in final demand. To illustrate this, assume that export demand for the sugar and sugar processing sector's output increased by \$100,000. To obtain the sector-by-sector economic effect resultant in Kauai's economy, each entry in the sugar and sugar processing sector's column in the interdependence table is multiplied by the initial economic change of \$100,000. Summing the effects on each of the individual sectors, an initial increase of \$100,000 in sugar and sugar processing sales resulted in a total increase in dollar transactions of \$255,000 for Kauai County's total economy. The sum of the individual coefficients in each column of the interdependence table is that sector's total output multiplier. For example, the total output multiplier for the sugar and sugar processing sector is approximately 2.55. Multiplying 2.55 times \$100,000 yields the above total increase in sales of \$255,000. The output multiplier for all of the sectors is given in Table V-9.

#### Employment Multiplier

An employment multiplier is defined as being the change in total employment in the economy resulting from a one-unit change in employment in the corresponding sector. The employment multipliers for the Kauai County input-output model are listed in Table V-10. For the actual development of the employment

TABLE V-9  
 OUTPUT MULTIPLIERS<sup>1</sup>

Sector Title	Output Multiplier
(1) Sugar and Sugar Processing	2.55
(2) Livestock	2.46
(3) Forestry, Fishing Products	1.37
(4) Other Agricultural Products	2.32
(5) Food Processing and Manufacturing	2.75
(6) Non-Food Processing and Manufacturing	1.74
(7) Building Construction	2.94
(8) Heavy and Special Trade Contractors	3.00
(9) Transportation	1.98
(10) Communication and Utilities	2.36
(11) Wholesale Trade	1.55
(12) Eating and Drinking Places	2.21
(13) Retail Food Stores	1.70
(14) Auto Dealers, Service Stations, Auto Repairs	2.35
(15) Apparel and Accessory Stores	1.64
(16) Furniture, Home Furnishing, and Equipment Stores	1.67
(17) Building Materials	1.72
(18) Miscellaneous Retail Stores	1.91
(19) Finance, Insurance, Real Estate	2.92
(20) Hotels	2.37
(21) Business Services	2.56
(22) Amusement and Recreation Services	2.59
(23) Personal Services	2.79
(24) Other Services	2.73
(25) Non-Classifiable Establishments	2.23
(26) Tourist Transportation	2.30
(27) Tourist Gifts and Souvenirs	2.02
(28) Tourist Entertainment	2.58
(29) County Government	3.99
(30) Household	3.09

<sup>1</sup>Kauai Socioeconomic Profile, Center for Non-Metropolitan Planning and Development, University of Hawaii.

TABLE V-10  
EMPLOYMENT MULTIPLIERS<sup>1</sup>

Sector Title	Employment Multiplier
(1) Sugar and Sugar Processing	1.125153
(2) Livestock	1.156878
(3) Forestry, Fishery Products	1.378413
(4) Other Agricultural Products	1.107512
(5) Food Processing and Manufacturing	1.357617
(6) Non-Food Processing and Manufacturing	1.123258
(7) Building Construction	1.408973
(8) Heavy and Special Trade Contractors	1.114985
(9) Transportation	1.078038
(10) Communication and Utilities	1.209207
(11) Wholesale Trade	1.373732
(12) Eating and Drinking Places	1.145804
(13) Retail Food Stores	1.659738
(14) Auto Dealers, Service Stations, Auto Repairs	1.623748
(15) Apparel and Accessory Stores	1.167622
(16) Furniture, Home Furnishing, Equipment Stores	1.245923
(17) Building Materials	1.175296
(18) Miscellaneous Retail Stores	1.394603
(19) Finance, Insurance, Real Estate	1.558208
(20) Hotels	1.201509
(21) Business Services	1.071084
(22) Amusement and Recreation Services	1.149274
(23) Personal Services	1.098800
(24) Other Services	1.107986
(25) Non-Classifiable Establishments	1.840673
(26) Tourist Transportation	1.033722
(27) Tourist Gifts and Souvenirs	1.226559
(28) Tourist Entertainment	1.115524
(29) County Government	1.465238

<sup>1</sup>Kauai Socioeconomic Profile, Center for Non-Metropolitan Planning and Development, University of Hawaii.

multiplier derived by the University of Hawaii's Center for Non-Metropolitan Planning and Development, refer to Appendix I, "Methodology and Data of the Input-Output Study," in the Kauai Socioeconomic Profile.

#### MOANA PROJECT INCOME AND EMPLOYMENT IMPACTS

This section will analyze the impact on the County's total economy of the resulting initial employment change resulting from the Moana Project.

#### Projected Income and Employment

Table V-11 shows the projected income and employment as a result of the Moana Project. Over the 15-year development period, the temporary construction employment reflects the actual direct employment of construction workers by Moana Corporation. Although construction of the single-family units is expected to continue through year 19, the associated employment is not attributed directly to Moana Corporation. The construction of the single-family units is dependent upon their individual owners. For the permanent employment, the 15-year development period is the length of time necessary before the estimated annual employment is considered to reach its permanent level. The annual permanent employment by the Moana Project at year 15 is 390, and this same level is expected to continue thereafter.

Table V-12 indicates the proportion of jobs, both temporary and permanent, estimated to be filled by local residents. These estimates by Moana Corporation, in cooperation with McDonald & Smart, Inc., are based on their past experience in Hawaii and on the Mainland in obtaining adequate employees for newly created job openings.

TABLE V-11

PROJECTED EMPLOYMENT AS A RESULT OF THE MOANA PROJECT<sup>1</sup>

	Years <sup>1</sup>														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>Temporary Employment</b>															
Construction Employment															
Management	2	3	3	3	3	3	2	2	2	2	2	2	2	2	2
Foreman/Supervisor	10	12	12	10	8	8	8	8	8	8	8	8	8	8	8
Building Trader	75	75	65	65	65	65	55	55	55	55	55	55	55	55	55
Unskilled	50	50	35	35	35	35	30	30	30	30	30	30	30	30	30
<b>Total Temporary Annual Employment</b>	<b>137</b>	<b>140</b>	<b>115</b>	<b>113</b>	<b>111</b>	<b>111</b>	<b>95</b>								
<b>Permanent Employment</b>															
Sales															
Management/Sales	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Clerical/Secretarial	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Single-Family Units	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
Building and Grounds Maintenance	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Maid Service															
Multi-Family Units/Rental															
Management	2	2	2	2	2	2	3	3	3	3	3	4	4	4	6
Clerical/Secretarial	8	11	14	17	20	23	26	29	32	35	38	41	44	47	50
Building and Grounds Maintenance	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Maid Service	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
Golf Course/Clubhouse															
Management	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3
Clerical/Secretarial	2	2	2	3	3	3	3	3	4	4	4	4	4	4	4
Building Maintenance	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Food Service	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Tennis Pro	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
Other Maintenance	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
<b>Total Permanent Annual Employment</b>	<b>87</b>	<b>108</b>	<b>128</b>	<b>152</b>	<b>173</b>	<b>194</b>	<b>216</b>	<b>236</b>	<b>261</b>	<b>282</b>	<b>303</b>	<b>325</b>	<b>346</b>	<b>367</b>	<b>390</b>

<sup>1</sup>Moana Corporation.

<sup>2</sup>Year 1 represents fiscal year 1977-78.

TABLE V-12  
EMPLOYMENT AND INCOME<sup>1</sup>

	Annual Employment	Average Salary	Salary Range	Average Wage Bill	Per Cent Local Employees
<b>Temporary Employment<sup>2</sup></b>					
Construction Employment					
Management	2	\$25,000	\$20,000-\$30,000	\$ 50,000	50%
Foreman/Supervisor	9	14,250	13,500- 15,000	128,250	75
Building Trader	60	13,250	10,000- 16,500	795,000	85
Unskilled	34	10,000	9,000- 11,000	340,000	100
Temporary Annual Employment	105	\$12,507		\$1,313,250	
<b>Permanent Employment<sup>3</sup></b>					
<b>Sales</b>					
Management/Sales	2	\$24,000	\$18,000-\$30,000	\$ 48,000	50
Clerical/Secretarial	2	9,100	6,200- 12,000	18,200	100
<b>Single-Family Units</b>					
Building and Grounds Maintenance	30	9,900	7,300- 12,000	297,000	100
Maid Service	15	8,300	6,200- 10,000	124,500	100
<b>Multi-Family Units/Rental</b>					
Management	6	24,000	18,000- 30,000	144,000	50
Clerical/Secretarial	50	8,300	6,200- 12,000	415,000	100
Building and Grounds Maintenance	90	9,900	7,300- 12,500	891,000	100
Maid Service	135	8,300	6,200- 10,400	1,120,500	100
<b>Golf Course/Clubhouse</b>					
Management	3	17,500	15,000- 20,000	52,500	50
Clerical/Secretarial	4	9,100	6,200- 12,000	36,400	100
Building Maintenance	20	9,900	7,300- 12,000	198,000	100
Food Service	10	8,000	6,000- 10,000	80,000	100
Tennis Pro	3	17,500	15,000- 20,000	52,500	67
Other Maintenance	20	8,000	6,000- 10,000	160,000	100
Permanent Annual Employment	390	\$ 9,327 <sup>4</sup>		\$3,637,600	

<sup>1</sup>Moana Corporation. <sup>2</sup>Average temporary employment over the 15-year development period. <sup>3</sup>Annual permanent employment at the end of the 15-year development period. <sup>4</sup>Excluding tips.

### Income Impacts

The total impact on Kauai's economy resulting from the Moana Project is illustrated in Tables V-13 and V-14. The direct and indirect requirements column is from the household column in the interdependence table. The requirements column is multiplied by the initial economic change from temporary and permanent employment, respectively, to obtain the total dollar change.

Tables V-15 and V-16 separate this total economic change into components:

a. Initial Economic Change. The initial economic change in the demand for labor by the construction and hotel sectors results in the increase of total wages to households.

b. Primary Economic Effect. As the total wages to the household sector increase, expenditures by households increase. Their expenditure pattern is obtained from the household column of the technical coefficient table.

c. Secondary Economic Effects. The secondary economic effect is the result of the increase in expenditures by sectors other than the household sector. As the households increase their purchases from local businesses, the local businesses also increase their purchases to meet the increase in the demand for their goods and/or services. This secondary effect goes on and filters throughout the economy.

### Total Multiplier Effect

The total economic change for Kauai includes all of the times that each dollar from the initial economic change is re-spent within the local economy. How large the total impact is depends upon:

TABLE V-13

CONSTRUCTION ACTIVITY IMPACTS<sup>1</sup>

Sector Title	Direct and Indirect Requirements <sup>2</sup>		Initial Economic Change <sup>3</sup>	Dollar Change
(1) Sugar and Sugar Processing	0.0002600	x	\$1,313,250 =	\$ 341
(2) Livestock	0.0172178	x	1,313,250 =	22,611
(3) Forestry, Fishing Products	0.0009725	x	1,313,250 =	1,277
(4) Other Agricultural Products	0.0138763	x	1,313,250 =	18,223
(5) Food Processing and Manufacturing	0.0112065	x	1,313,250 =	14,717
(6) Non-Food Processing and Manufacturing	0.0241882	x	1,313,250 =	31,765
(7) Building Construction	0.0718240	x	1,313,250 =	94,323
(8) Heavy and Special Trade Contractors	0.0240201	x	1,313,250 =	31,544
(9) Transportation	0.0295377	x	1,313,250 =	38,790
(10) Communication and Utilities	0.0548694	x	1,313,250 =	72,057
(11) Wholesale Trade	0.2400791	x	1,313,250 =	315,285
(12) Eating and Drinking Places	0.0804800	x	1,313,250 =	105,690
(13) Retail Food Stores	0.2635913	x	1,313,250 =	346,161
(14) Auto Dealers, Service Stations, Auto Repairs	0.2602329	x	1,313,250 =	341,751
(15) Apparel and Accessory Stores	0.0838033	x	1,313,250 =	110,055
(16) Furniture, Home Furnishing, Equipment Stores	0.0395883	x	1,313,250 =	51,989
(17) Building Materials	0.0718071	x	1,313,250 =	94,301
(18) Miscellaneous Retail Stores	0.0509669	x	1,313,250 =	66,932
(19) Finance, Insurance, Real Estate	0.1018980	x	1,313,250 =	133,818
(20) Hotels	0.0066846	x	1,313,250 =	8,779
(21) Business Services	0.0712473	x	1,313,250 =	93,566
(22) Amusement and Recreation Services	0.0137495	x	1,313,250 =	18,057
(23) Personal Services	0.0174548	x	1,313,250 =	22,923
(24) Other Services	0.1039562	x	1,313,250 =	136,520
(25) Non-Classifiable Establishments	0.0004091	x	1,313,250 =	537
(26) Tourist Transportation	0.0007349	x	1,313,250 =	965
(27) Tourist Gifts and Souvenirs	0.0007183	x	1,313,250 =	943
(28) Tourist Entertainment	0.0042710	x	1,313,250 =	5,609
(29) County Government	0.0258585	x	1,313,250 =	33,959
(30) Household	1.4073591	x	1,313,250 =	\$1,848,214
Total	3.0928627	x	\$1,313,250 =	\$4,061,702

<sup>1</sup>Change in economic activity in Kauai County due to an increase of \$1,313,250 in wages to the household sector from construction activity associated with the Moana Project.

<sup>2</sup>Kauai input-output model.

<sup>3</sup>See Table VI-12.

<sup>4</sup>Total multiplier effect.

Source: McDonald & Smart, Inc.

TABLE V-14

TOURIST ACTIVITY IMPACTS<sup>1</sup>

Sector Title	Direct and Indirect Requirements <sup>2</sup>	Initial Economic Change <sup>3</sup>	Dollar Change
(1) Sugar and Sugar Processing	0.0002600	x \$3,637,600 =	\$ 946
(2) Livestock	0.0172178	x 3,637,600 =	62,631
(3) Forestry and Fishing Products	0.0009725	x 3,637,600 =	3,538
(4) Other Agricultural Products	0.0138763	x 3,637,600 =	50,476
(5) Food Processing and Manufacture	0.0112065	x 3,637,600 =	40,765
(6) Non-Food Processing and Manufacturing	0.0241882	x 3,637,600 =	87,987
(7) Building Construction	0.0718240	x 3,637,600 =	271,267
(8) Heavy and Special Trade Contractors	0.0240201	x 3,637,600 =	87,376
(9) Transportation	0.0295377	x 3,637,600 =	107,446
(10) Communication and Utilities	0.0548694	x 3,637,600 =	199,593
(11) Wholesale Trade	0.2400791	x 3,637,600 =	873,312
(12) Eating and Drinking Places	0.0804800	x 3,637,600 =	292,754
(13) Retail Food Stores	0.2635913	x 3,637,600 =	958,840
(14) Auto Dealers, Service Stations, Auto Repairs	0.2602329	x 3,637,600 =	946,623
(15) Apparel and Accessory Stores	0.0838033	x 3,637,600 =	304,843
(16) Furniture, Home Furnishing, Equipment Stores	0.0395883	x 3,637,600 =	144,006
(17) Building Materials	0.0718071	x 3,637,600 =	261,206
(18) Miscellaneous Retail Stores	0.0509669	x 3,637,600 =	185,397
(19) Finance, Insurance, Real Estate	0.1018980	x 3,637,600 =	370,664
(20) Hotels	0.0066846	x 3,637,600 =	24,316
(21) Business Services	0.0712473	x 3,637,600 =	259,169
(22) Amusement and Recreation Services	0.0137495	x 3,637,600 =	50,015
(23) Personal Services	0.0174548	x 3,637,600 =	63,494
(24) Other Services	0.1039562	x 3,637,600 =	378,151
(25) Non-Classifiable Establishments	0.0004091	x 3,637,600 =	1,488
(26) Tourist Transportation	0.0007349	x 3,637,600 =	2,673
(27) Tourist Gifts and Souvenirs	0.0007183	x 3,637,600 =	2,613
(28) Tourist Entertainment	0.0042710	x 3,637,600 =	15,536
(29) County Government	0.0258585	x 3,637,600 =	94,063
(30) Household	<u>1.4073591</u>	x 3,637,700 =	<u>\$5,119,409</u>
Total	3.0928627	x \$3,637,600 =	\$11,250,597 <sup>4</sup>

<sup>1</sup>Change in economic activity in Kauai County due to an increase of \$3,637,600 in wages to the household sector from tourist activity associated with the Moana Project.

<sup>2</sup>Kauai input-output model.

<sup>3</sup>See Table VI-12.

<sup>4</sup>Total multiplier effect.

Source: McDonald & Smart, Inc.

# CORRECTION

THE PRECEDING DOCUMENT(S) HAS  
BEEN REPHOTOGRAPHED TO ASSURE  
LEGIBILITY  
SEE FRAME(S)  
IMMEDIATELY FOLLOWING

Wilson Jones

TABLE V-14

TOURIST ACTIVITY IMPACTS<sup>1</sup>

Sector Title	Direct and Indirect Requirements <sup>2</sup>		Initial Economic Change <sup>3</sup>	Dollar Change
(1) Sugar and Sugar Processing	0.0002600	x	\$3,637,600 =	\$ 946
(2) Livestock	0.0172178	x	3,637,600 =	62,631
(3) Forestry and Fishing Products	0.0009725	x	3,637,600 =	3,538
(4) Other Agricultural Products	0.0138763	x	3,637,600 =	50,476
(5) Food Processing and Manufacture	0.0112065	x	3,637,600 =	40,765
(6) Non-Food Processing and Manufacturing	0.0241882	x	3,637,600 =	87,987
(7) Building Construction	0.0718240	x	3,637,600 =	271,267
(8) Heavy and Special Trade Contractors	0.0240201	x	3,637,600 =	87,376
(9) Transportation	0.0295377	x	3,637,600 =	107,446
(10) Communication and Utilities	0.0548694	x	3,637,600 =	199,593
(11) Wholesale Trade	0.2400791	x	3,637,600 =	873,312
(12) Eating and Drinking Places	0.0804800	x	3,637,600 =	292,754
(13) Retail Food Stores	0.2635913	x	3,637,600 =	958,840
(14) Auto Dealers, Service Stations, Auto Repairs	0.2602329	x	3,637,600 =	946,623
(15) Apparel and Accessory Stores	0.0838033	x	3,637,600 =	304,843
(16) Furniture, Home Furnishing, Equipment Stores	0.0395883	x	3,637,600 =	144,006
(17) Building Materials	0.0718071	x	3,637,600 =	261,206
(18) Miscellaneous Retail Stores	0.0509669	x	3,637,600 =	185,397
(19) Finance, Insurance, Real Estate	0.1018980	x	3,637,600 =	370,664
(20) Hotels	0.0066846	x	3,637,600 =	24,316
(21) Business Services	0.0712473	x	3,637,600 =	259,169
(22) Amusement and Recreation Services	0.0137495	x	3,637,600 =	50,015
(23) Personal Services	0.0174548	x	3,637,600 =	63,494
(24) Other Services	0.1039562	x	3,637,600 =	378,151
(25) Non-Classifiable Establishments	0.0004091	x	3,637,600 =	1,488
(26) Tourist Transportation	0.0007349	x	3,637,600 =	2,673
(27) Tourist Gifts and Souvenirs	0.0007183	x	3,637,600 =	2,613
(28) Tourist Entertainment	0.0042710	x	3,637,600 =	15,536
(29) County Government	0.0258585	x	3,637,600 =	94,063
(30) Household	<u>1.4073591</u>	x	3,637,700 =	<u>\$5,119,409</u>
Total	3.0928627	x	\$3,637,600 =	\$11,250,597 <sup>4</sup>

<sup>1</sup>Change in economic activity in Kauai County due to an increase of \$3,637,600 in wages to the household sector from tourist activity associated with the Moana Project.

<sup>2</sup>Kauai input-output model.

<sup>3</sup>See Table VI-12.

<sup>4</sup>Total multiplier effect.

Source: McDonald & Smart, Inc.

TABLE V-15

COMPONENTS OF THE CONSTRUCTION ACTIVITY MULTIPLIER<sup>1</sup>

Sector Title	Initial Economic Change	+	Primary Economic Effect	+	Secondary Economic Effect	=	Dollar Change
(1) Sugar and Sugar Processing	\$ 0	\$	0	\$	341	\$	341
(2) Livestock	0		5,785		16,826		22,611
(3) Forestry and Fishing Products	0		14		1,263		1,277
(4) Other Agricultural Products	0		6,887		11,336		18,223
(5) Food Processing and Manufacturing	0		3,074		11,634		14,717
(6) Non-Food Processing, Manufacturing	0		20,479		11,286		31,765
(7) Building Construction	0		49,701		44,622		94,323
(8) Heavy and Special Trade Contractors	0		3,831		27,713		31,544
(9) Transportation	0		16,567		22,223		38,790
(10) Communication and Utilities	0		28,979		43,078		72,057
(11) Wholesale Trade	0		3,829		311,456		315,285
(12) Eating and Drinking Places	0		74,395		31,295		105,690
(13) Retail Food Stores	0		244,673		101,488		346,161
(14) Auto Dealers, Service Stations, Auto Repairs	0		222,580		119,171		341,751
(15) Apparel and Accessory Stores	0		77,379		32,676		110,055
(16) Furniture, Home Furnishing, Equipment Stores	0		35,668		16,321		51,989
(17) Building Materials	0		56,019		38,282		94,301
(18) Miscellaneous Retail Stores	0		42,866		24,066		66,932
(19) Finance, Insurance, Real Estate	0		71,894		61,924		133,818
(20) Hotels	0		5,339		3,440		8,779
(21) Business Services	0		55,717		37,849		93,566
(22) Amusement and Recreation Services	0		12,057		6,000		18,057
(23) Personal Services	0		15,101		7,822		22,923
(24) Other Services	0		92,079		44,441		136,520
(25) Non-Classifiable Establishments	0		65		472		537
(26) Tourist Transportation	0		650		315		965
(27) Tourist Gifts and Souvenirs	0		664		279		943
(28) Tourist Entertainment	0		3,956		1,653		5,609
(29) County Government	0		17,660		16,299		33,959
(30) Household	1,313,250		54,690		480,274		1,848,214
Total			\$1,313,250		\$1,222,598		\$1,525,854=\$4,061,702

<sup>1</sup>McDonald & Smart, Inc.

TABLE V-16

COMPONENTS OF THE TOURIST ACTIVITY MULTIPLIER<sup>1</sup>

Sector Title	Initial Economic Change	+	Primary Economic Effect	+	Secondary Economic Effect	=	Dollar Change
(1) Sugar and Sugar Processing	\$ 0	\$	0	\$	946	\$	946
(2) Livestock	0		16,024		46,607		62,631
(3) Forestry and Fishing Products	0		38		3,500		3,538
(4) Other Agricultural Products	0		19,077		31,399		50,476
(5) Food Processing and Manufacturing	0		8,515		32,250		40,765
(6) Non-Food Processing, Manufacturing	0		56,724		31,263		87,987
(7) Building Construction	0		137,668		123,599		261,267
(8) Heavy and Special Trade Contractors	0		10,611		76,765		87,376
(9) Transportation	0		45,888		61,558		107,446
(10) Communication and Utilities	0		80,270		119,323		199,593
(11) Wholesale Trade	0		10,607		862,705		873,312
(12) Eating and Drinking Places	0		206,067		86,687		292,754
(13) Retail Food Stores	0		677,726		281,114		958,840
(14) Auto Dealers, Service Stations, Auto Repairs	0		616,530		330,093		946,623
(15) Apparel and Accessory Stores	0		214,332		90,511		304,843
(16) Furniture, Home Furnishing, Equipment Stores	0		98,799		45,207		144,006
(17) Building Materials	0		155,169		106,037		261,206
(18) Miscellaneous Retail Stores	0		118,736		66,661		185,397
(19) Finance, Insurance, Real Estate	0		199,142		171,522		370,664
(20) Hotels	0		14,788		9,528		24,316
(21) Business Services	0		154,333		104,836		259,169
(22) Amusement and Recreation	0		33,397		16,618		50,015
(23) Personal Services	0		41,828		21,666		63,494
(24) Other Services	0		255,050		123,101		378,151
(25) Non-Classifiable Establishments	0		180		1,308		1,488
(26) Tourist Transportation	0		1,801		872		2,673
(27) Tourist Gifts and Souvenirs	0		1,839		774		2,613
(28) Tourist Entertainment	0		10,958		4,578		15,536
(29) County Government	0		48,917		45,146		94,063
(30) Household	3,637,600		151,487		1,330,322		5,119,409
Total			\$3,637,600		\$3,386,501		\$4,226,496
							= \$11,250,597

<sup>1</sup>McDonald & Smart, Inc.

a. The proportion of the initial economic change spent within Kauai County is referred to as the initial economic effect; the greater this portion, the larger the total multiplier.

b. The secondary adjustments are dependent upon the number of sectors and their degree of involvement with the chain of events activated by the initial economic change; the greater the degree of interrelationships within the economy, the larger the total multiplier.

#### Summary of Income and Employment Impacts

Table V-17 summarizes the income impact as a result of the Moana Project. During the development period, average annual construction wages are estimated to be \$1,313,250 (initial economic change). The construction wages annually will generate approximately \$4,061,702 (total economic change) in economic activity for the county through the multiplier process.

Table V-17 shows that at the end of the development period, the average annual permanent wage of \$3,637,600 (initial economic change) will generate annually, through the multiplier process, \$11,250,597 (total economic change) in economic activity.

The average wage dollar paid in Kauai gets spent approximately 3.09 times during the year. A year is the estimated time it takes for the greatest portion of the secondary economic effects to filter throughout the economy.

Table V-18 summarizes the total change in employment resulting from the project. Every construction job creates 1.41 jobs throughout the County's economy and every hotel-related job creates 1.20 jobs throughout the County's economy. The actual job breakdown would be in proportions similar to the construction and hotel columns in the interdependence table.



TABLE V-18

TOTAL CHANGE IN EMPLOYMENT<sup>1</sup>

<u>Sector Title</u>	<u>Direct Employment Change<sup>2</sup></u>	<u>Employment Multiplier<sup>3</sup></u>	<u>Total Employment Change</u>
Building Construction	105	1.408973	148
Hotels	390	1.201509	469

<sup>1</sup>McDonald & Smart, Inc.

<sup>2</sup>See Table VI-12.

<sup>2</sup>See Table VI-10.

In contrasting the Moana Project with a no project alternative, the no project alternative is assumed to produce no private employment. The derived Moana Project income and employment impacts would in this case also represent the net difference between the project alternative and the no project alternative.

Figure V-1 graphically displays the economic activity which would result from the Moana Project.

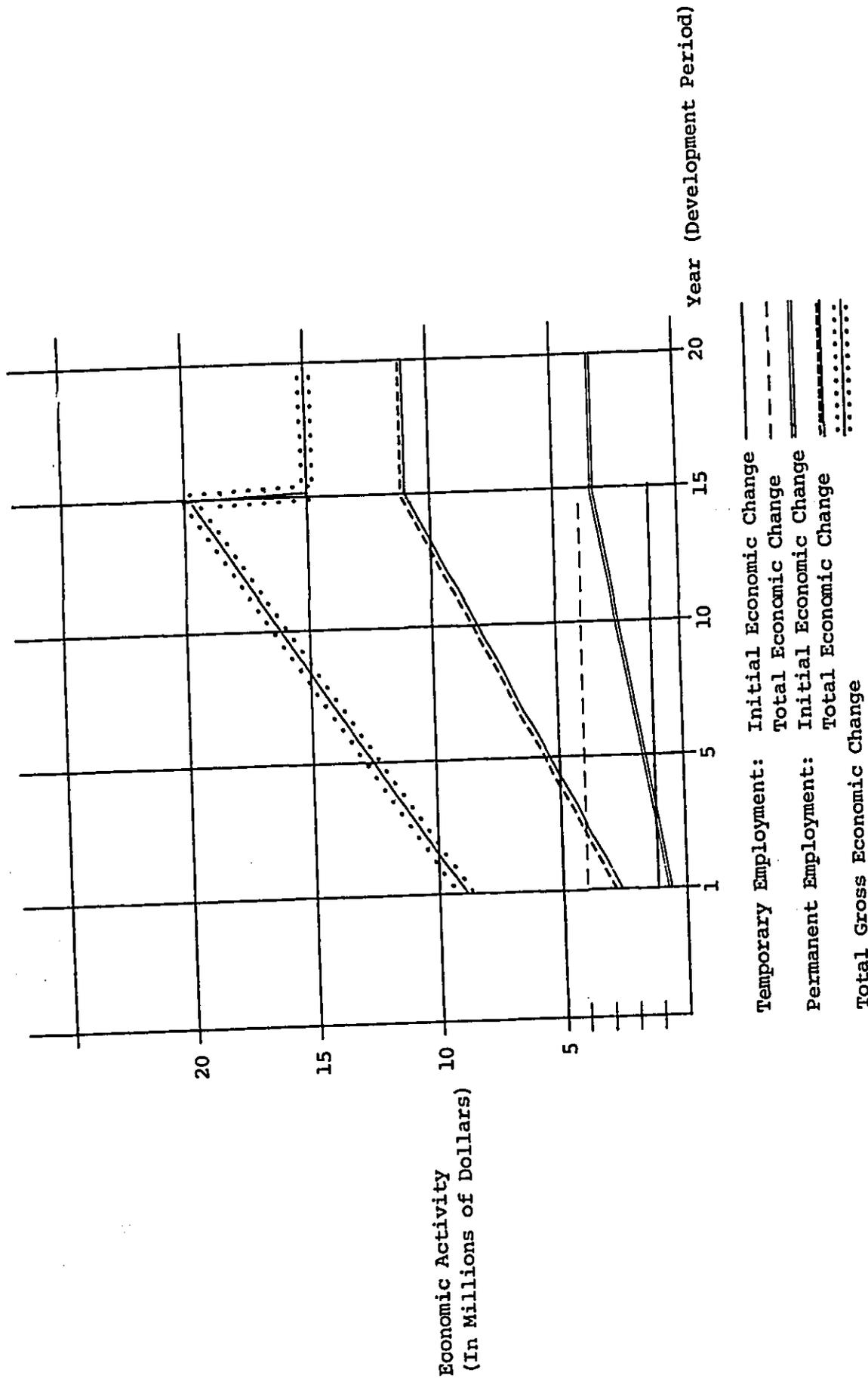
#### COMMENTS ON THE ANALYSIS

All changes in economic activity estimated by the input-output model are actually predictions of long-term effects. In the long-run, the model assumes that permanent changes in the total sales of a sector will result in increased expenditures by the sector. These expenditures are assumed to be proportionate to the present expenditures pattern of the sector. This may not be what actually occurs.

If the change in sales were small, even long-run expenditures might not increase proportionately because of unfilled capacity. For example, if there were a small increase in manufacturing sales, raw materials costs would probably increase proportionately but labor costs would not. On the other hand, if an increase in sales were larger, this might involve a change in technology and therefore a change in the present proportion of expenditures.

If there were a large increase in some agricultural sector, the new production probably would involve the latest, most efficient technology. This would probably imply a change in the expenditure pattern or the technical coefficients of the sector. For these reasons, any use of the input-output model to predict the effect of a change in sales should be viewed as an approximation of the actual economic effects.

FIGURE V-1  
MOANA PROJECT ECONOMIC ACTIVITY<sup>1</sup>



<sup>1</sup>McDonald & Smart, Inc.

PART II

THE PHYSICAL IMPACT  
OF  
KIAHUNA GOLF VILLAGE

---

Prepared by:

BELT, COLLINS AND ASSOCIATES, LTD  
745 Fort Street, Suite 514  
Honolulu, Hawaii 96813

## I. SUMMARY OF PHYSICAL FINDINGS

From a purely physical standpoint, the 480-acre site of the proposed Moana Project is appropriate for development as a resort residential community. This statement is predicated on the following aspects: a gently sloped site suitable for the type of development proposed; a warm and sunny climate with generally mild, constant breezes; and the site's proximity to excellent beaches, resort hotels, and historic, cultural, and scenic areas of interest. These factors are combined with the fact that the site presently has very low productivity for agricultural uses due to the rockiness of the land and shallowness of the soil. Past efforts towards sugarcane cultivation have been unsuccessful. The implementation of the proposed project would complement the Poipu area, which has been designated by both the State and the County of Kauai as a principal resort destination area.

There are no known rare or endangered animal or plant life that would be destroyed or disturbed by the proposed project. The proposed landscaping and golf course development could create a habitat for numerous types of birds which are now not found on the site.

The Moana Project will be a quality development, master planned and constructed in such a fashion as to provide a physical environment which will benefit all of its residents, while preserving a generally rural character. All important archaeological findings will be surveyed to ascertain their relative importance, and those sites which are considered significant will be set aside as preservation sites. All buildings will be low-rise, basically three stories or less. Upon total development, nearly 70% of the project site will remain as uncovered open space, and the visual nature of the site will be greatly enhanced through landscaping.

Infrastructure requirements can generally be met with little difficulty. However, an additional source of domestic water must be developed as the project is developed over time because the present system is nearly capacity. The existing sewage treatment plant facility, just mauka of Poipu Road, will also require expansion. Power, gas, and telephone needs will be met as the demand arises.

The three areas of some concern are: (1) impact on the air due to automobile emissions and construction; (2) noise created by vehicles and construction; and (3) water pollution, specifically to coastal water due to fertilization and irrigation practices in the future at the Moana Project. Because of the nature and size of this community, it is felt that these impacts will probably not have great adverse effect. Projected traffic as a result of this community does not appear to overburden the capacity of Poipu Road.

## II. PHYSICAL SETTING

### THE PHYSICAL ENVIRONMENT

#### Geology

The major portion of Kauai, and the underlying base material, is comprised of the Waimea Canyon volcanic series. The Waimea Canyon volcanic series derives all of its material from the main shield volcano of Kauai, which began erupting about 4 million years ago in the Pliocene epoch of the tertiary period. Near the end of the eruption, the shield collapsed and a broad caldera was formed. All of the lava flows and associated pyroclastic rocks that accumulated on the flanks of the major Kauai shield volcano have been named the Napali formation of the Waimea Canyon volcano series. The thickness of the Napali formation, which extends 15,000 feet below sea level, is approximately 19,000 feet. The Napali formation comprises most of the upper highlands exterior of the shield, as well as most of the underlying base material for the coastal areas. Within this formation is the primary basal water aquifer.

After the eruption of the major Kauai shield volcano terminated, there was a period of volcanic inactivity. Continued erosion took place, which resulted in the formation of rich topsoil. Subsequent intermittent eruptions developed additional volcanic shields to the south and east of the original major shield. This new volcanic material, which overlaid the original Napali formation, is called the Koloa volcanic series. The evolution of the Koloa volcanic series, layered over the Waimea Canyon volcanic series, can be seen in exposed canyon walls. The topography in the area of the proposed project is a result of the activity of numerous vents, cinder and splatter cones, and shields.

The material in both series is made up of different basalts, primarily olivine basalt. Whereas the Napali formation is highly permeable and yields high-quality basal ground water, the Koloa volcanic series is comprised of poor to moderately permeable rock; and water from this layer tends to be brackish towards the sea. This series yields water slowly to wells, and varies in its water retention characteristics. The Koloa volcanic series has an impounding effect on the basal water in the Napali formation, thus accounting for high basal hydraulic gradients found in the Napali formation.

#### Topography

The elevation on the project site varies from about 140 feet in the northern portion to about 20 feet in the southeastern end. The slope is generally between 2% to 3% throughout the project area. Due to the low permeability of the underlying rock and the relatively flat slope, there are problems with flooding along Waikomo Stream and sheet runoff during heavy rainfall in this area.

#### Soils

The predominant soils in the area are in the Reddish Brown Group, as classified by the Soil Conservation Service. The Reddish Brown Group is one of the eleven Great Soil Groups for Kauai. This group is unique to the Poipu area, and is confined to the geologically recent pahoehoe and cinder cone area near Koloa. It is related to deposits of ash, cinder, alluvium, and sugarcane trash. Generally, the deeper the topsoil, the more productive it is; however, in the project area, the topsoil is generally less than 20 inches deep, which results in a low productivity level. The soil is relatively unweathered and fairly rockly. Also

contributing to low productivity are drainage problems due to the flatness of the terrain, poor nutrient context of the soil, lack of adequate rainfall most of the year, and moderate salinity, which interferes with normal crop growth. Because of the preceding soil characteristics, the Land Study Bureau of the University of Hawaii classified this area with an overall productivity rating of "E", which is the lowest rating.<sup>1</sup>

The Reddish Brown (Soil) Group on the Moana Project site is comprised primarily of soils in the Waikomo Soil Series, as designated by the Soil Conservation Service. The following are the specific soils in the Waikomo Soil Series, which prevail the project area<sup>2</sup> (Figure 1).

o WAIKOMO STONY SILTY CLAY (WS)

In a representative soil profile, the surface layer is very dark grayish-brown stony silty clay about 14 inches thick. The subsoil, about 6 inches thick, is reddish-brown, stony heavy silty clay loam that has subangular and angular blocky structure. The substratum is hard rock. The soil is neutral to mildly alkaline throughout.

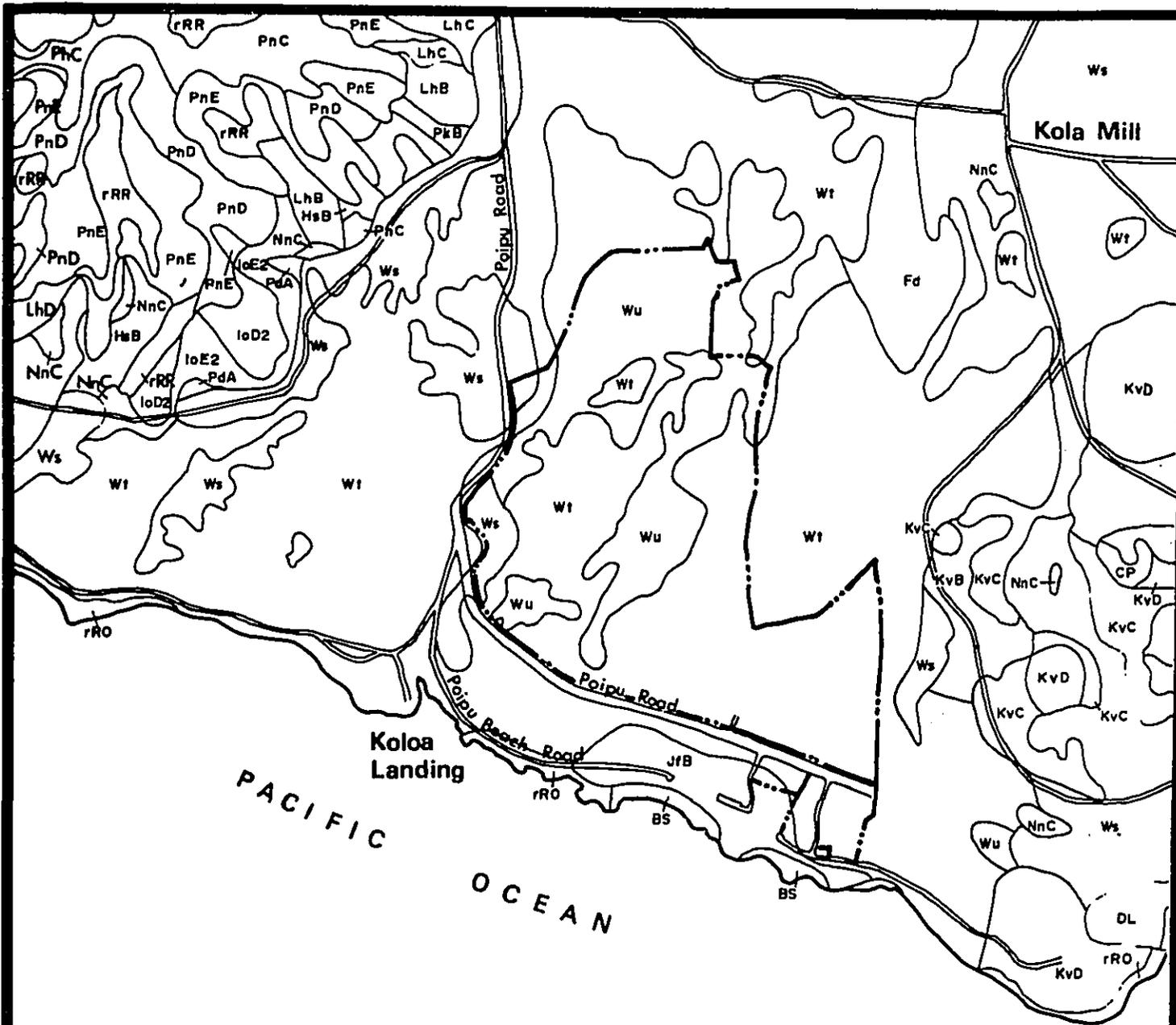
Permeability is moderate. Runoff is slow, and the erosion hazard is slight. The available water capacity is about 1.0 inch per foot of soil. Except for cracks in the rock, roots penetrate to a depth of no more than 20 inches.

The project site is comprised of approximately 10% of this class of soil.

---

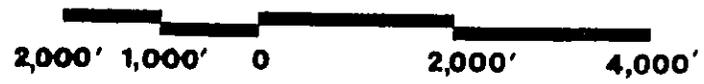
<sup>1</sup>Reference 20, pp. 5-7.

<sup>2</sup>Reference 6, pp. 132-133.



Symbol	Soil Type	Slope	Symbol	Soil Type	Slope
BS	Beaches		NnC	Nonopahu Clay	2-10 %
CP	Cinder Pit		PdA	Pakala Clay Loam	0 - 2 %
DL	Dune Land		PnC	Puhi Silty Clay Loam	8 - 15 %
Fd	Fill Land		PnD	" " " "	15 - 25 %
HsB	Honamau Silty Clay	3 - 8 %	PnE	" " " "	25 - 40 %
IoD2	Ioleau Silty Clay Loam - Eroded	12 - 20 %	rRO	Rock Outcrop	
IoE2	Ioleau Silty Clay Loam - Eroded	20 - 35 %	rRR	Rough Broken Land	
JfB	Jaucos Loamy Fine Sand	0 - 8 %	Ws	Waikomo Stony Silty Clay	
KvC	Koloa Stony Silty Clay	8 - 15 %	Wt	Waikomo Very Rocky Silty Clay	
KvD	" " " "	15 - 25 %	Wu	Waikomo Extremely Rocky Silty Clay	
LhB	Lihue Silty Clay	0 - 8 %			
LhC	" " " "	8 - 15 %			
LhD	" " " "	15 - 25 %			

Figure 1



Soils: Koloa-Poipu Area

o WAIKOMO VERY ROCKY SILTY CLAY (WT)

This soil is similar to Waikomo stony silty clay, except that rock out-crops cover 3% to 25% of the surface. This soil is used for pasture, wildlife habitat, and homesites. Some small areas are irrigated.

This soil comprises about 60% of the project site.

o WAIKOMO EXTREMELY ROCKY SILTY CLAY (WU)

This soil is similar to Waikomo stony silty clay, except that rock out-crops cover 25% to 50% of the surface.

This soil is used for pasture, wildlife habitat, and homesites.

This soil comprises about 30% of the project site.

Climate

Rainfall: Records for rainfall and temperature patterns have been taken in the past years at the National Weather Service's climatological station 935.1 near Koloa at Paanau. These characteristics are shown in Table 1. The average rainfall per annum for the area is about 45.60 inches, with most of the rainfall coming in the winter months from November through March. Light and average intensity rainfall can be absorbed by the soil on the project site; however, heavy rainfall creates drainage problems, resulting in sheet flow runoff and flooding. There are three main types of storms that account for the heaviest rainfalls. From July to December, periodic heavy tropical storms with a potential to generate hurricane intensities cause heavy rains and wind conditions. There have been, however, only four hurricanes affecting Kauai since 1904. In the winter months, there are two other types of high intensity rainstorms. A cold

TABLE 1  
CLIMATOLOGICAL DATA FOR KOLOA, KAUAI, HAWAII<sup>1</sup>

Month	Temperature - Degrees F.		Station 935.1 - Paanau			Rainfall - Inches		
	Maximum	Minimum	Maximum	Minimum	Mean	Maximum	Minimum	Mean
January	86	48	6.38	5.67	5.95	17.9	3.9	5.3
February	88	46	5.99	4.19	5.20	7.0	2.9	4.9
March	88	46	7.16	6.11	6.67	11.4	0.4	5.9
April	86	51	7.53	6.08	7.01	4.8	1.7	2.9
May	87	54	9.95	7.18	8.04	2.8	0.8	1.4
June	88	59	8.59	7.26	8.04	2.3	0.8	1.1
July	89	63	8.78	7.19	8.16	4.1	1.0	2.6
August	89	61	8.80	7.19	8.25	4.5	1.1	2.2
September	89	59	9.08	6.78	7.97	5.8	1.0	2.2
October	89	53	7.78	6.36	7.19	7.7	0.7	4.4
November	87	50	6.89	5.94	6.41	15.8	2.8	5.8
December	85	50	6.63	5.15	5.65	14.6	2.2	6.9
TOTAL			93.56	75.10	84.54	98.7	19.3	45.6
AVERAGE	89	46			73.4			

<sup>1</sup> Station number 936 in accordance with State key number system.

Note: Above data from National Weather Service Climatological Data Summaries. Temperature values are based on 33 years of record.

front storm, created when cool air comes in contact with warmer air over a land mass, lasts for a short period of time and is quite localized, but may result in high intensity rainfall. The second type of storm is a Kona storm, which occurs when a high level, low pressure trough is being fed by moisture from the winter Kona winds.<sup>1</sup> The effects of rainfall on flooding will be discussed in a later section of this report.

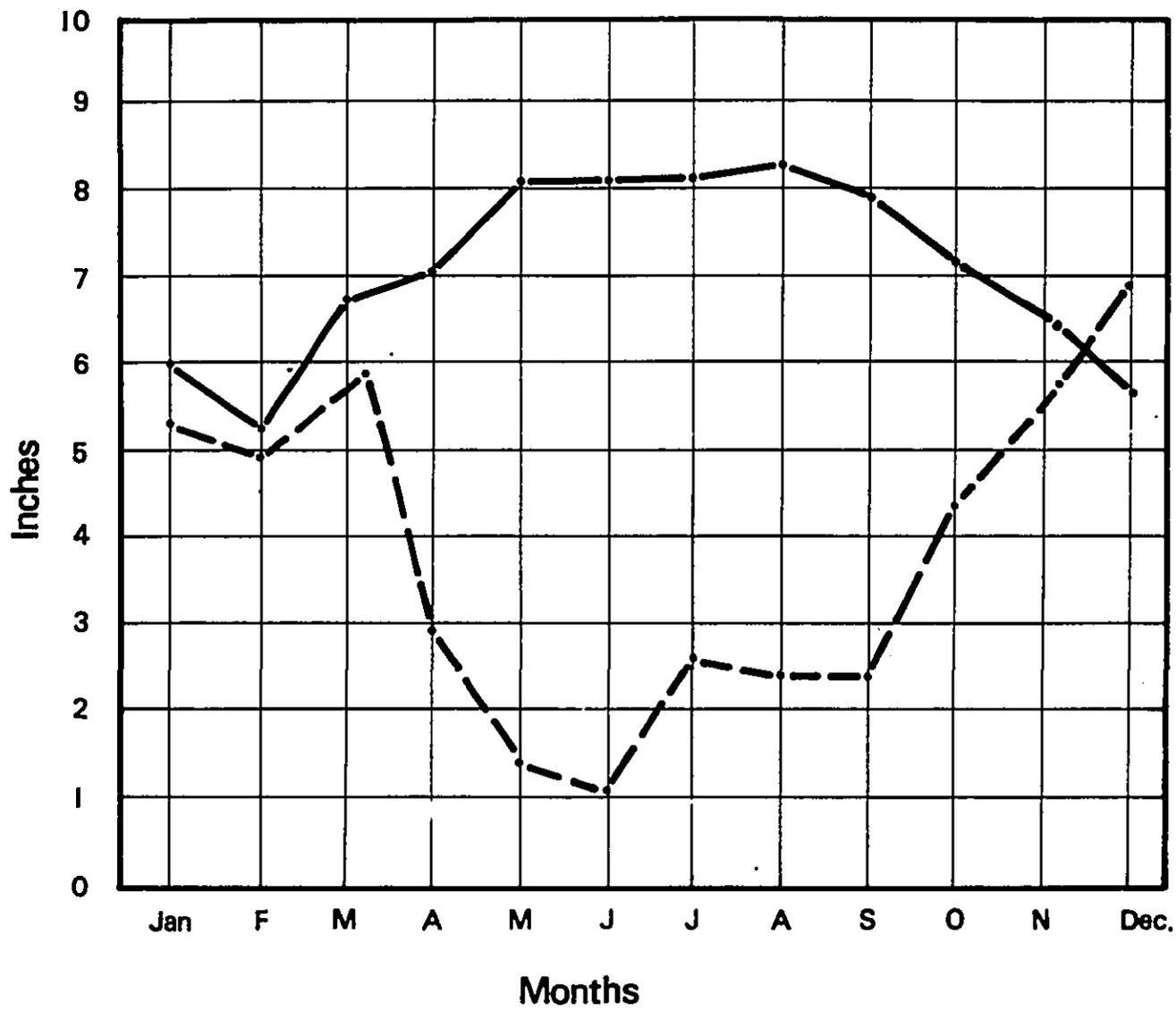
Pan Evaporation: Pan evaporation measurements have been taken from the active climatological station 935.1 (Paanau) for the past 10 years. Pan evaporation does not measure actual evaporation, but potential for evaporation. In actuality, evaporation cannot take place if there is no water present in the soil. It can be seen from the evaporation versus rainfall graph (Figure 2) that potential maximum evaporation occurs in July. However, because the evaporation rate is so great in the period between March and mid-October, there is virtually no ground water recharge. Therefore, the actual evaporation is less than the indicated pan evaporation. Low soil permeability also hinders percolation of rainfall to the basal lens, and thereby increases evaporation. Generally, the area is very dry. Ground water recharge occurs from November to March.<sup>2</sup>

Wind: There is only one National Weather Service meteorological monitoring station on Kauai, which is located in Lihue. General wind patterns, however, do not vary widely throughout the Island. Typically, the wind direction ranges from the north-northeast to the east blowing generally southwest at average speeds of between 9 and 12 knots per hour. The only significant variation to this pattern is during the winter months when periodically the Kona winds are experienced. The Kona winds originate from the west.

---

<sup>1</sup>Reference 2, p. A-2.

<sup>2</sup>Reference 11, p. 60.



●—● Evaporation Data  
 ●- - -● Rainfall Data  
 \* Taken at Climatological Station 935.1 - Paanau, Kauai

Monthly Rainfall Vs. Pan Evaporation

Figure 2

Temperature: Data for temperature has been recorded at climatological station 935.1 in Koloa for the past 33 years. Although there may be a wide monthly variation of maximum and minimum temperatures, the general monthly range is from 69.5° to 76.8°F (see Table 1). During the summer, which extends from May through September, the weather tends to be warm and dry, with the trade-winds prevailing. Average temperatures typically range from the upper 80's to the lower 60's. In the winter, which extends from October through April, the weather becomes cooler and rainier, with a more variable wind pattern, including occasional Kona winds. Average temperatures during the winter months normally range from the mid-80's to the lower 50's°F.

#### Surface Water Hydrology

The Koloa-Poipu flood plain is divided into six drainage areas (A through F), as well as the Waikomo Stream basin, as shown in Figure 3. The drainage areas' upper reaches begin well above the project area. The tributary area for Waikomo Stream is approximately 10.4 square miles; the extent of the six contiguous drainage areas within the Koloa-Poipu area is about 3.5 square miles. The Moana Project site is contained within the lower reaches of these drainage areas. On the project site, the major area of potential inundation is on the western portion of the site, adjacent to Waikomo Stream where existing culverts are inadequate to accommodate 100-year peak flood flow. The 100-year storm has a flow of 18,200 cubic feet per second; the culvert capacity is 7,000 cubic feet per second. The flood plain limit of Waikomo Stream is within drainage area "A". The other six areas have a total flow of 8,890 cubic feet per second for the 100-year storm (see 100-year storm limits in Figure I-2, Volume 1). There is little danger of flooding occurring on-site; however, sheet flow runoff may occur during heavy rainfall



because there are no natural channels in these drainage areas. This flow is tributary to depressed sump areas across Poipu Road along the old Poipu Road, where drainage is a problem.<sup>1</sup>

Tsunami may potentially contribute to flooding in the Koloa-Poipu area. Tsunami evacuation limits for the area were obtained from the Tsunami Inundation Center at the University of Hawaii. For a 30-foot wave, the limit is at the 20-foot contour inland; and for a 50-foot wave, the limit is at the 30-foot contour. These limits are shown in Figure 4. In an extreme situation, tsunami have the potential for severely damaging property on the southern portion of the site along Poipu Road. However, tsunami have never caused much damage to the Koloa-Poipu area.<sup>2</sup>

#### Ground Water Hydrology

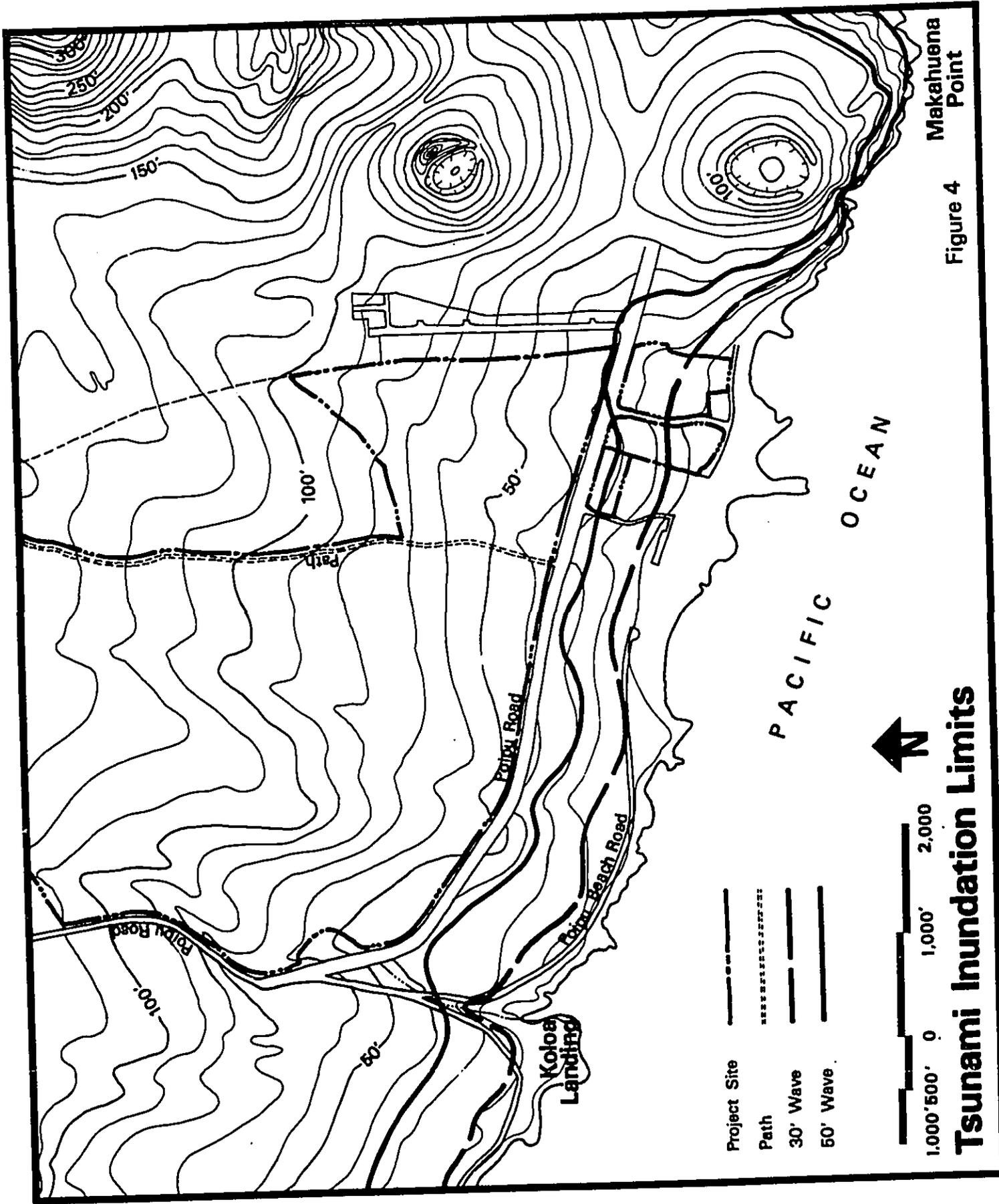
GENERAL. An understanding of the Ghyben-Herzberg lens is of major importance in the discussion of basal groundwater of an island. Basal groundwater is a large body of water which lies below the main water table near sea level. The fresher portion of the basal groundwater is called the Ghyben-Herzberg lens. Commonly, it is the body of fresh water floating in and displacing heavier sea water. The size and displacement of the lens is dependent upon a number of factors such as specific gravities of the two waters, rate of fresh water recharge, permeability of the rocks containing water, the mixing effect when the different waters come in contact, and the energy involved in movement of the water.

Groundwater also occurs as dike-impounded water, and as perched water. Dike-impounded water occurs when impermeable dikes cut across permeable rock containing groundwater, thus restricting

---

<sup>1</sup>Reference 2, pp. A-1 to A-7.

<sup>2</sup>Ibid., pp. 4-7.



the movement of groundwater. In some cases, the dikes are oriented in such a fashion as to create a compartment of groundwater, with vertical dimensions as great as, or greater than, its horizontal dimensions. Although leakage may occur through the dikes, discharge of excess water usually occurs over the crests of the dikes in the form of springs, which are cut into dikes by the action of streams. Perched water occurs when water above the basal aquifers is restricted from percolating to the basal lens by an underlying, impermeable layer of rock. The impermeable layer is normally a bed of ash, soil, and dense lava flows. Perched water bodies vary in depth and areal extent.<sup>1</sup>

SPECIFIC TO KOLOA-POIPU AREA. Basal water appears to be readily available on the southern slopes of the Haupu Ridge west of Mahaulepu. Presently, two wells (16A and 16B), just north of Koloa and west of Waita Reservoir, serve as the source of the domestic water supply for the Koloa-Poipu area. Their locations are shown in Figure 5. Water quality data for the two wells is presented in Table 2. All of the wells along this latitude in the vicinity indicate that the Napali aquifer near the ridge has the best potential for further development as a future water source. The static heads vary from 5 to 119 feet. The static heads with higher elevations are the result of the impounding effects of the rocks in the Koloa volcanic series, which lie over the Napali formation. The quality of the water from the basal fresh water aquifer is exceptional. At lower elevations on the Koloa Plain, the static heads for basal water decrease dramatically, which indicates that the Napali formation drops off steeply from Haupu Ridge towards the sea. Good quality water, however, is still available near the seashore at greater

---

<sup>1</sup>Reference 4, pp. 121-123.



TABLE 2

SAMPLE WATER QUALITY DATA FROM WELLS SUPPLYING  
DOMESTIC WATER FOR THE KOLOA-POIPU AREA

	<u>Well 16A</u>	<u>Well 16B</u>
Static Head	45.2 ft.	45.0 ft.
pH	7.4	7.5
SiO <sub>2</sub>	56 mg/l	56 mg/l
Ca	8.92	14.2
Mg	11.00	9.42
Na	20.00	20.50
K	1.20	4.00
HCO <sub>3</sub>	89	n.a.
SO <sub>4</sub>	5.9	n.a.
Cl	25	26
F	0.10	n.a.
NO <sub>3</sub>	0.20	1.61
Al	4.02	0.05
Hydroxide Alkalinity as CaCO <sub>3</sub>	0	n.a.
Carbonate Alk. as CaCO <sub>3</sub>	0	0
Bicarbonate Alk. as CaCO <sub>3</sub>	86	76
Total Alkalinity	86	76
Total Hardness	70	74.4

Note: The water from these wells, deriving their supply from the Napali formation, is generally excellent.

n.a. = Not available.

Source: U.S. Geological Survey.

depths, because the interface between the Koloa volcanic series and the Napali formation acts as an impermeable barrier to brackish water in the Koloa series. It follows that wells must be drilled deeper near the shore to come in contact with good quality basal water, which would entail considerable cost. Also, because the coastal areas are overlain with the Koloa volcanic series, fresh water outflow to the sea is considered to be minute.

Dike-impounded water may exist in small quantities in the Napali formation to the south of the Haupu Caldera. However, due to a lack of springs at easily accessible sites, indications are that this potential supply of water does not occur in large quantities. Development of this water supply would be costly and difficult because a search for these sources would have to be conducted in the rugged valleys of the Haupu Ridge. Transport of this water would create problems.

Perched water occurs in small amounts in rocks of the Koloa volcanic series. Springs and seepage occur where stream valleys intersect the perched water bodies and, in some, cases, provide small supplies of domestic water. However, the poor permeability of the Koloa volcanic series is not favorable for the development of large supplies of water in perched aquifers.<sup>1</sup>

A generalized cross-section of the Koloa-Poipu area which illustrates the above water characteristics, is presented in Figure 6.

#### Coastal Water Quality

The ocean currents just off Makahuena Point in the Koloa-Poipu area are generally from the northeast to southwest direction.

---

<sup>1</sup>Reference 4, p. 139.

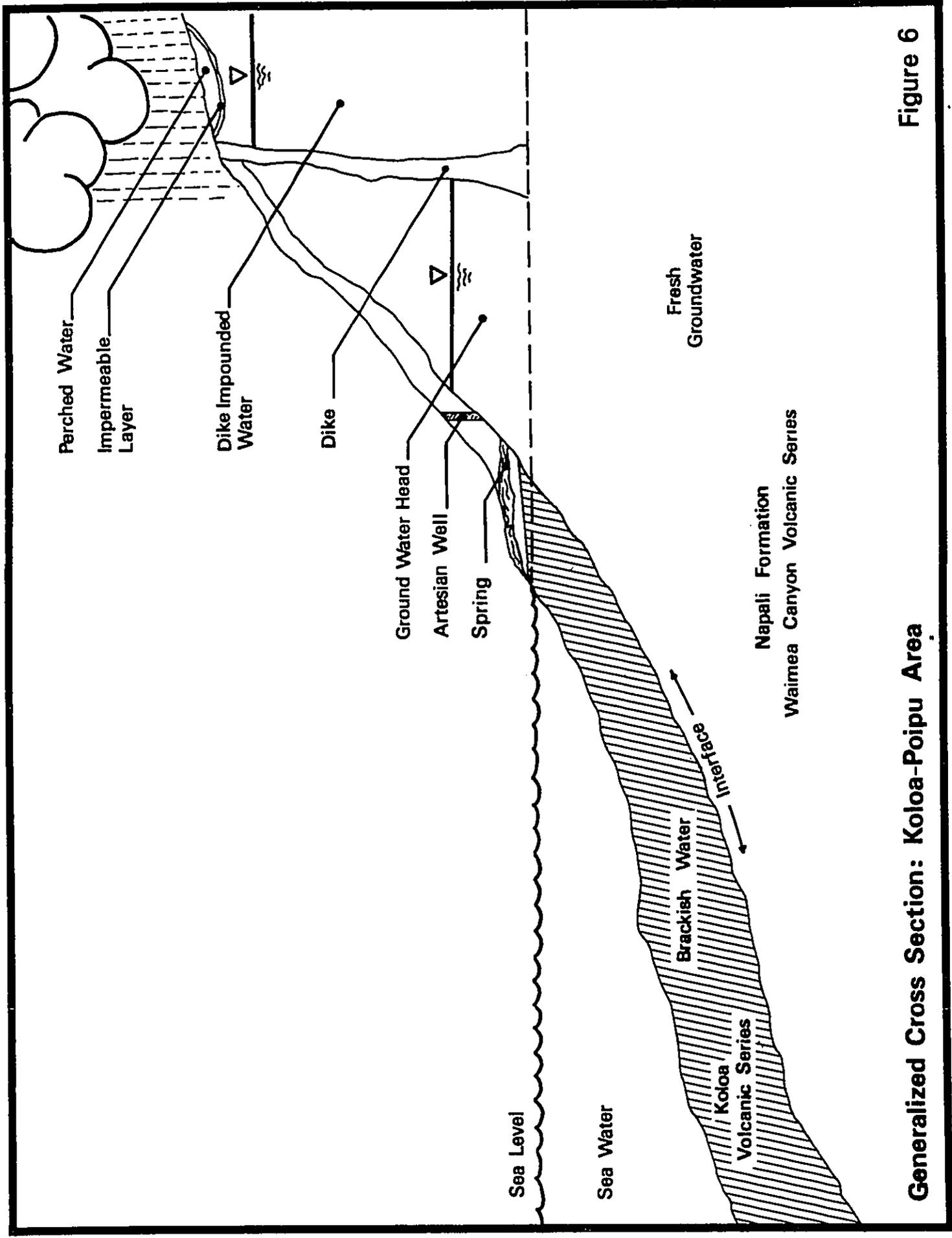


Figure 6

Generalized Cross Section: Koloa-Poipu Area

A semi-diurnal tidal current is superimposed upon this current. The velocity of these southwesterly currents, as monitored in 1966, has a range of 0.23 knots/hour to 1.08 knots/hour, and the direction of the current varies between 241° to 252° true north. Although there may be some eddy effects along the coast, which are caused by near shore currents creating a circular movement of water just off the southeast coast, the main current flows rapidly enough to the southwest so that whatever pollution entering coastal waters is adequately dispersed in the sea, and its effect minimized.<sup>1</sup>

Most of the time the quality of the coastal water is within class AA limits as designated by the Department of Health, State of Hawaii. Data from water quality sampling stations were examined to check nutrient levels as recorded by the University of Hawaii, Water Resources Research Center. This information is provided in Table 3. Total and fecal coliform data was obtained from the Department of Health and is reproduced in Table 4. It can be expected that, at times, the water quality will normally drop below class AA standards because these standards are quite stringent.<sup>2</sup>

Class AA water standards, as set forth by the Public Health Regulations, Department of Health, State of Hawaii, are as follows:

o MICROBIOLOGICAL REQUIREMENTS

The median coliform bacteria shall not exceed 70 per 100 ml. during any 30-day period nor shall samples exceed 230 per 100 ml. at any time.

---

<sup>1</sup>Reference 14, pp. 1-25.

<sup>2</sup>Eugene Akazawa, Department of Health, State of Hawaii.

TABLE 3

COASTAL WATER QUALITY DATA - NUTRIENT LEVELS

	mg/l			µg/l							ng/l		
	N	P	K	Pb	Cu	Zn	Cd	Hg	Cr	Ni	As	DDT	PCP
Koloa 21°52'51"N, 159°28'17"W	-	-	838	ND	ND	ND	ND	ND	ND	ND	ND	1	1
6/27/72												2	1
8/22/72	.104	.021	482	ND	ND	ND	ND	ND	ND	ND	1		
7/25/73	-	-	544	1	ND	3	ND						
Kiikunula 21°53'7"N, 159°30'17"W	-	-	852	2	ND							1	10
6/27/72													
Allerton's 21°53'15"N, 159°30'17"E	-	-	845	ND	ND				5	ND		1	1
6/27/72													
McBryde 21°52'51"N, 159°31'56"E	.196	.001	452	ND	ND	3	ND					1	ND
8/22/72	-	-	541	2	ND	3	ND						
7/25/73													

ND = Not detectable.

Source: Quality of Coastal Waters, Second Annual Progress Report, Water Resources Research Center, University of Hawaii, pp. 160-161.

TABLE 4

COASTAL WATER QUALITY DATA - COLIFORMS  
(MPN/100 ml)

<u>Date</u>	<u>Total Coliform</u>	<u>Fecal Coliform</u>	<u>Date</u>	<u>Total Coliform</u>	<u>Fecal Coliform</u>
1/24/72	43.0	90.0	4/30/73	4.0	>3.0
2/07/72	>3.0	>3.0	5/14/73	>3.0	>3.0
3/06/72	15.0	7.0	6/12/73	>3.0	>3.0
3/20/72	>3.0	>3.0	1/08/74	>3.0	>3.0
4/17/72	43.0	9.0	1/15/74	>3.0	>3.0
5/01/72	>3.0	>3.0	1/22/74	15.0	7.0
5/15/72	4.0	4.0	1/29/74	9.0	9.0
6/05/72	4.0	>3.0	2/05/74	4.0	>3.0
7/10/72	>3.0	>3.0	2/20/74	23.0	23.0
7/24/72	>3.0	>3.0	3/05/74	4.0	>3.0
8/14/72	23.0	23.0	3/12/74	>3.0	>3.0
8/28/72	93.0	93.0	3/19/74	75.0	75.0
9/25/72	>3.0	>3.0	3/27/74	4.0	3.0
10/16/72	21.0	21.0	4/02/74	9.0	4.0
11/06/72	>3.0	>3.0	4/09/74	9.0	9.0
11/13/72	4.0	4.0	4/16/74	43.0	9.0
12/04/72	>3.0	>3.0	4/23/74	>3.0	>3.0
12/18/72	>3.0	>3.0	4/30/74	>3.0	>3.0
1/08/73	>3.0	>3.0	5/07/74	4.0	>3.0
1/22/73	>3.0	>3.0	5/14/74	>3.0	>3.0
2/05/73	4.0	4.0	6/04/74	>3.0	>3.0
3/05/73	>3.0	>3.0	6/12/74	>3.0	>3.0
3/19/73	>3.0	>3.0	6/18/74	4.0	>3.0
4/02/73	>3.0	>3.0	6/25/74	4.0	>3.0
4/16/73	4.0	4.0			

Average Total Coliform = 11/100 ml.

Average Fecal Coliform = 9.6/100 ml.

Source: Department of Health, State of Hawaii

o pH - UNITS

Not more than 1/2 unit difference from natural conditions but not lower than 8.0 nor higher than 8.5 from other than natural causes. (Not lower than 7.0 for fresh tidal waters.)

o NUTRIENTS MATERIALS

Total phosphorus, not greater than 0.020 mg/l; total nitrogen not greater than 0.10 mg/l.

o DISSOLVED OXYGEN (except from natural causes)

Not less than 6.0 mg/l.

o TOTAL DISSOLVED SOLIDS, SALINITY, AND CURRENTS

No changes in channels, in basin geometry of the area, or in fresh water influx shall be made which would cause permanent changes in isohaline patterns of more than  $\pm 10\%$  of naturally occurring variation of which would otherwise affect biological and sedimentological situation. Total dissolved solids shall not be below 28,000 mg/l from other than natural causes.

o TEMPERATURE

Temperature of receiving waters shall not change more than  $1.5^{\circ}$  from natural conditions.

o TURBIDITY

Secchi disc or secchi disc equivalent as "extinction coefficient" determinations shall not be altered from natural conditions more than 5% for class AA or class 1 waters, 10% for class A or class 2 waters, or 25% for class B waters.

o RADIONUCLIDES

Concentrations of radioactive materials shall not exceed minimum concentrations which are feasible to achieve. In no case shall such material exceed the limits established in 1962 Public Health Service Drinking Water Standards (or later amendments) or 1/30th of the MPCw values given for continuous occupational exposure in the National Bureau of Standards Handbook No. 69. The concentrations in water shall not result in accumulation of radioactivity in plants or animals that result in a hazard to humans or harm to aquatic life.

The concentration of radioactive materials present in fresh, estuarine, and marine water shall be less than those that would require restrictions on the use of organisms harvested from the area in order to meet the Radiation Protection Guides recommended by the Federal Radiation Council.<sup>1</sup>

There appears to be no direct discharge of wastewater in this coastal area. The Moana Project sewage treatment plant discharges effluent to the land as irrigation water. The Kauai Sheraton discharges effluent to an infiltration well, and the Grove Farm Mill discharges its effluent into lagoons.

Terrestrial Biology

An accounting of the known types of flora and fauna found on the project site is present below. Generally speaking, however, both the flora and fauna are sparse and lack diversity.

---

<sup>1</sup>Reference 8, pp. 9-10.

Flora: The 480-acre project site is covered predominantly with koa haole (*Leucaena galuca* (L.) Benth) and kiawe (*Prosopis pallida*). In portions of the site, this coverage is quite dense. In other areas, the site has been virtually cleared and is utilized for pasture land for cattle. Because of the harsh environmental conditions, both the koa haole and kiawe exhibit a scrub appearance and growth habit.

In addition to the above, other plants which are found on the site are basically limited to the following:<sup>1</sup>

- o Oi (*Verbena litoralis*) - A tropical American perennial herb long established in Hawaii, and which is considered a common weed, from 1 to 6 feet high. Oi has slender, smooth, quadrangular stems and paired, long-stalked, narrow flowering heads bearing tiny blue flowers.
- o Japanese tea (*Cassia leschenaultiana*) - A partly erect shrub 2 to 3 feet high, with conspicuous yellow flowers.
- o Lantana (*Lantana montevidensis*) - A south American ornamental shrub with long-trailing branches and ovate toothed leaves an inch long, has pink flowers about 1 inch in diameter.
- o Natal Red Top (*Rhynchelytrum repens*) - A South African grass that thrives on dry, sandy soil.
- o Prickly Pear Cactus (*Opuntia Megacantha*) - A Mexican plant which may grow to 15 feet, cactus with a few bristles, fruit bearing, yellow to orange flowers.

---

<sup>1</sup>Reference 5, p. 37.

- o Rattail grass (*Sporobolus africanus*) - 0.5 to 3 feet high, with narrow leaves and spikelike panicles, tufted perennial.
- o Guava (*Psidium cocciniferum*) - Shrub tree 10 to 20 feet high with smooth cylindrical branches, dark green leaves, bears a 1 inch diameter fruit (strawberry guavas).

All of these plants are basically drought tolerant and none are considered valuable or rare, except that they provide a ground cover for soil stabilization and prevent runoff to some degree. During much of the year, their growth also presents a possible brush fire hazard due to the general dryness of the site and a constant northwesterly breeze. Because of poor soil conditions and a lack of rainfall, it is felt that there would be little change in the plant communities or growth patterns if these lands were taken out of pasture to lie fallow.

Fauna: There are a number of fairly common mammals that inhabit the Poipu coastal region of Kauai. Those which can be expected to be found on the project site are:

- o Hawaiian rat (*Rattus exulans hawaiiensis*) - native to Hawaii
- o Black rat (*Rattus Rattus*)
- o House mouse (*Mus musculus domesticus*)
- o Mongoose (*Herpestes auropunctatus*)
- o Feral cat (*Felis catus*)

These mammals are quite common and not endangered.

There are also various types of bird life that inhabit this area; however, none of the species of birds are considered rare or endangered. As a generality, except for the migratory birds, these birds stay in the area year-round nesting, foraging, and breeding. They include:<sup>1</sup>

	<u>Indigenous</u>	<u>Migratory</u>	<u>Exotic</u>
Black-crowned heron ( <i>Nycticorax nycticorax hoacti</i> )	X		
Pacific golden plover ( <i>Pluvialis dominica fulva</i> )	X	X	
Wandering tattler ( <i>Heteroscelus brevipes</i> )	X	X	
Hawaiian short eared owl ( <i>Asio falmmus sandwichensus</i> )	X		
Lace-necked dove ( <i>streptopelia chinensus</i> )			X
Barred dove ( <i>Geopelia striata</i> )			X
Barn owl ( <i>Tyto alba pratincola</i> )			X
Mocking bird ( <i>Mimum polyglottos</i> )			X
Indian mynah ( <i>Acridotheres tristis</i> )			X
White eye (Mejiro) ( <i>Fosterops japonica</i> )			X
Western meadowlark ( <i>Sturnella neglecta</i> )			X
House finch ( <i>Carpodacus mexicanus frontalis</i> )			X
English sparrow ( <i>Passer domesticus</i> )			X
Ricebird ( <i>Lonchura punetulata</i> )			X
Cardinal ( <i>Richmondena cardinalis</i> )			X

#### HISTORICAL SETTING

##### Pre-European, American Contact Period

From studies and observations made by early Christian missionaries, it is estimated that the Koloa-Poipu area contained a population of several thousand native Hawaiians before European and American settlement occurred. There are remnants of four heiaus or temple platforms in the Poipu area, two of which are considered of major size. There is no evidence that there were any villages located in the area, but only scatterings of grass huts situated along the stream banks. It was primarily a fisher/agrarian

<sup>1</sup>Reference 10.

oriented society, whose major crops were sweet potatoes, taro, mulberry, arrowroot, and hala leaves used for mats. Records also indicate that there were numerous fishponds located along the coast. Contact with the outside world generally occurred later than for other parts of the Islands, principally because of the lack of significant harbors. The shoreline in this part of Kauai is typically dotted with major coves and bays; whalers preferred anchoring at Waimea farther down the coast. By 1834, just prior to European and American settlement, the native population in the Koloa-Poipu area had dwindled to just over 2,000 people. This was principally due to continued strife and emigration.<sup>1</sup>

The Bernice P. Bishop Museum has estimated that there are about 155 sites located in the southern portion of the site, bordering Poipu Road (approximately 200 acres), which represent population settlements of the pre-European/American Contact Period. The sites basically remain intact, and are considered by the Bishop Museum as significant. This is in contrast to many of the archaeological sites in surrounding areas which have either been altered beyond recognition or have been totally destroyed. The archaeological sites and artifacts include platforms, enclosures, large walled structures, modified natural forms, agricultural complexes, lava tube shelters, stone structures, irrigated pond fields, and foot trails and historic sites, such as house, tomb, and oven sites.

#### Post-Contact Period

The first major permanent settlement of Europeans and Americans in the Koloa-Poipu area occurred in 1835, with the establishment

---

<sup>1</sup>Reference 15, p. 53.

of the Koloa Branch of the Waioli Mission by Reverend and Mrs. Peter Gulick. It was also in 1835 that the first permanent sugar plantation in the Hawaiian Islands was established at Koloa by the firm of Ladd and Compnay. The plantation's operation continued into the 1900's with mixed degrees of success. In the early 1850's, the first of a series of shiploads of immigrants arrived at Kauai to offset the diminishing local labor force. The immigrants who worked on the Koloa Sugar Plantation were first Chinese and, later, Japanese, Portuguese, and Filipinos who settled in and around Koloa Town. By 1920, the town and vicinity had a population of approximately 8,000 people.

In addition to sugar, other agricultural experimentation was undertaken by the Koloa Sugar Plantation in an attempt to increase profits. Experiments included the growing of silkworms, coffee, Kukui nuts for oil, sago, and tapioca. Unfortunately, all attempts failed for various reasons.

During the late 1800's, Koloa Landing (see Figures 1 and 2, Volume I) served as a whaling vessel resupply station, as well as an export point for sugar, sweet potatoes, and molasses.<sup>1</sup>

Since the early 1900's to the present, the majority of the land comprising the Moana Project site has either been under cattle grazing or lain fallow. The few attempts at sugarcane cultivation in this area were successful due primarily to the unsuitability of the soil, and lack of adequate water sources for irrigation.

---

<sup>1</sup>Reference 21, p. 79.

## INFRASTRUCTURE

### Water System

The Poipu area obtains its domestic water from the County's Koloa water system. The source is two deep wells mauka of Koloa town. Storage is provided by a 250,000-gallon tank at elevation 245 feet in Koloa town. Water is then transmitted through 12- and 10-inch mains down Poipu Road to the Poipu area. The Koloa system is operating near its maximum capacity in providing for present domestic water needs and is inadequate to serve the additional demands required by the proposed development.

A water master plan for the Koloa-Poipu area was developed as part of the overall water plan by the Department of Land and Natural Resources and the Kauai Board of Water Supply (Report R40 - A General Plan for Domestic Water, Island of Kauai, February, 1972). The ultimate projected water demands in the General Plan were based on existing land use designations. In computing the total demand, the Knudsen Trust lands mauka of the new Poipu Road (including the proposed project site) were classified as agricultural/open without any water demands. The new proposed land uses would generate an additional water demand above the Board of Water Supply's projections for the Koloa-Poipu area.

### Sewage Treatment

The Poipu area presently has two small sewage treatment facilities in operation. The Kauai Sheraton has a small sewage treatment plant on its site; its generated effluent flows into infiltration wells. The completed Kiahuna Condominium development makai Poipu Road uses a temporary sewage treatment plant, just

mauka of Poipu Road. The other hotels and residential areas in the Poipu area are serviced by septic tanks or cesspools.

#### Electric Power

The Koloa-Poipu area power requirements are met under normal conditions by the Koloa Mill Power Plant. If there are additional requirements for power, the Lawai Substation can also be employed. There are presently no plans for expansion of electrical service to the area.

#### Gas

The households of the Koloa-Poipu area that use gas are supplied by propane gas tanks, unless a large-scale development (3,000+ dwelling units) is constructed. No underground gas lines are planned for the future.

#### Telephone

Hawaiian Telephone has a switching station located in Koloa behind the service station. There are no plans for expansion because there is ample capacity to handle future demands at the existing switching station.

### TRANSPORTATION

#### Roads

The project area is bounded on the west and south by Poipu Road, which is the main traffic corridor from Poipu Beach to Highway 50 and Kauai's urban centers. The town of Kauai is one mile north of the proposed development, and Lihue is approximately ten miles

northeast of Koloa. Poipu Road, which replaced the old Poipu Beach Road as the main arterial to Poipu, has a 120-foot right-of-way. At this time, only a two-lane road which terminates at the Weliweli Subdivision has been constructed within the existing right-of-way. Poipu Road serves the Sheraton Kauai, Plantation Gardens, Poipu Beach Hotel, Kiahuna Resort Complex, Waiohai Hotel, and the Poipu Beach Park, as well as a few house-lots on the beach and the Weliweli Subdivision. A major road from Koloa to Poipu along the Knudsen Trusts-State of Hawaii property boundary is proposed for the future to connect into Poipu Road, thus creating better regional circulation.

#### Public and Private Ground Transportation

There are no public buses servicing the Koloa-Poipu area from Lihue. The only intercity bus service on Kauai is operating between Lihue and Wailua, north of Lihue. Visitors employ three modes of transportation, depending upon their finances and length of stay: tour buses, rental cars (U-drive), and taxis. The great majority of visitors to the Koloa-Poipu area arrive by tour bus in tour groups.

#### Harbors and Sea Transportation

Near the project area are two major and one minor harbors. The harbors of Nawiliwili, just south of Lihue, and Port Allen, 10 miles west of Koloa, have the capacity for small to medium ships (drafts of 35 to 40 feet). Both ports are used primarily as freight depots. A Coast Guard facility is also located at Port Allen. The Sea/Flite Company has a hydrofoil scheduled for one daily round-trip between Honolulu and Nawiliwili.

Three miles west of Koloa is Kukuiula Harbor which is an undeveloped small boat harbor. It has one boat dock; most visiting small boats anchor offshore and use dinghies to come ashore.

Airports and Air Transportation

Lihue Airport is the major air gateway to Kauai from the other islands, and is serviced by various inter-island airlines. The drive from the airport to the Koloa-Poipu area takes approximately 25 minutes; the distance is about 11 miles.

A heliport is located at the Kauai Sheraton in Poipu with helicopters principally flying tourists to and from Lihue Airport. A small private airstrip is located near Koloa Mill, which is used predominantly for crop dusting purposes.

III. RELATIONSHIP OF PROPOSED ACTION TO LAND  
USE PLANS, POLICIES, AND CONTROLS

The relationship of the proposed Moana Project to the County's land use plans, policies, and controls is discussed in the following paragraphs.

CONSISTENT WITH GENERAL PLAN GOALS AND OBJECTIVES

It is felt that the proposed development on the 480-acre site is consistent with the goals and objectives of the Kauai General Plan as set forth in March, 1970 (p. 25).

Goal 1

To maintain the concept of Kauai as "The Garden Isle"; thus, insuring any growth be in consonance with the unique landscape and environmental character of the island.

In this development, nearly 50% of the total acreage will be in golf course or open space uses, both of which will be landscaped and beautified to the fullest extent. Therefore, the visual image of this area will be enhanced. Also, all of the housing will be restricted to a maximum of three stories, keeping the character of this development consistent with adjacent uses (resort and agriculture).

Goal 2

To insure that all physical growth is consistent with the overall ecology of the island.

Before this project begins, the infrastructure of the site will be thoroughly planned so as to insure that any wastes generated

by the development will not affect the surrounding environment. There will be little effect on the natural systems of the island.

Goal 3

To create opportunities for a greater fulfillment of life through the development of a broad spectrum of educational and cultural pursuits.

It is expected that residents of the area will benefit from the preservation and possible restoration of the significant archeological sites within the project. Of special importance is the heiau on the 20-acre site behind Poipu Beach Park which is to be dedicated to the County and possibly developed into an historical center.

Goal 4

To create opportunities for a greater diversity of employment for residents of Kauai.

The Moana Project will expand Kauai's growing visitor/recreation industry. Jobs will open up for the tennis facility, golf course, the historical center, general grounds maintenance, and the commercial shops, not to mention indirect opportunities that may result from support industries.

Goal 5

To promote and protect the health, safety, and welfare of all residents.

Public agencies (police, fire, health care, etc.) will expand their manpower and facilities accordingly as the development grows, so that the general well-being of the residents is taken care of. Additional taxes generated by the project will more than cover the costs to the County for expanding these services.

Goal 6

To provide a desirable house or living quarters for all residents in all income levels.

Multi- and single-family dwelling units in the moderate to high income range are planned. Also included is employee housing on the project site.

Goal 7

To provide for a maximum variety of outdoor recreational activities.

The Moana Project will provide several recreational facilities which will be open to the general public. This includes a golf course which is needed in the area as well as a major tennis complex. In addition, 20 acres are being provided for expansion of the beach park.

Goal 8

To recognize those aspects of the island and its people which are historically significant, and to preserve and promote them as a continuing expansion of the island's physical and social structure.

As stated before, in the 20<sup>th</sup> park dedication to the County, there are the ruins of an ancient heiau. This has been declared an historic preservation site, and an historical center may be built by the County to contain the artifacts and the heritage for visitors to inspect. Should other important archaeological sites be discovered, they also will be set aside.

Goal 9

To promote the improvement and expansion of the island's economy by recognizing and carefully utilizing land and water resources.

An adequate water supply is crucial to the Moana Project. Therefore, the developer will continue to work closely with the County to expand the water system and develop new sources for the region.

Goal 10

To guide and control development to take full advantage of the island's form, beauty, and climate and preserve the opportunity for an improved quality of life.

For many years, Poipu has been designated as a visitor-resort destination area. The climate and proximity to the ocean makes it an ideal location for a golf course/residential development. The project does not interfere with prime agricultural lands, and preserves scenic areas for all to enjoy.

Goal 11

To guide physical growth so that island and visitor communities will develop in social and economic concert with each other.

The development will integrate a variety of housing types for different residential needs (visitor, part-time, full-time residents) with the expectations that there will be interaction between the various members of the community. In addition, all recreational facilities will be accessible to the general public.

Goal 12

To provide workable planning tools to meet the changing needs of the community.

The goal is not applicable to the proposed development.

Goal 13

To create, develop, and sustain an economy and population that will require and encourage the educated youth to live on the island and contribute to the formulation of a new dynamic society.

At the end of the 15-year development period, there will be a total of 390 new jobs as a direct result of the project.<sup>1</sup> Other jobs will be generated from this project indirectly. Many of these jobs will require skill and education. Much of this new work force will derive itself from the educated Kauai youth population.

The General Plan also lists 83 objectives which are derived from the above goals. Many of these objectives are satisfied directly by the Moana Project, such as developing beach parks (#18), golf courses (#31), and tennis courts (#63). The project does not conflict with any of the stated objectives, although there are a number of them which are not applicable to a project of this nature.

#### DESIRABLE LAND USE PATTERN

The study area will provide housing in a golf course, resort setting. The project also is providing tennis courts and a small convenience commercial center. It is within two miles of Koloa which will remain as the major commercial and civic focus of the area. The development is contiguous with the existing resort area, and its rural character will provide a transition from the hotels on Poipu Beach to the agricultural land surrounding the development.

#### RELATIONSHIP TO COUNTY DEVELOPMENT PLAN

There is no County development plan for this area at the present time.

#### CONTIGUOUS TO EXISTING URBAN AREA

The area from Waikomo Stream east, makai of Poipu Road to Makahuena Point as well as a portion of land west of the project area mauka of Poipu Road (the Weliweli Subdivision) is all in the State Urban District. The town of Koloa, which is also in an Urban District, is just northwest of the project area. Therefore, the project is contiguous with or near existing urban areas on much of its boundaries.

#### PROVIDES/MAINTAINS SHORELINE ACCESS

As stated previously, the development area is mauka of Poipu Road and is not adjacent to the ocean. Shoreline access through Poipu Beach Park will be facilitated by the 20<sup>±</sup> acres which will be dedicated to the County as park space, east of the Waiohai Hotel.

#### INTERACTION WITH ADJACENT USES

Several of the proposed uses within the project are intended to serve the entire Poipu resort community and the residents of the Koloa region. These include the golf course, tennis courts, beach park, and convenience shopping area. Residents within the proposed development are expected to utilize the beaches in the area as well as the restaurants and night clubs in the existing resort developments.

To make adjacent uses compatible, the plan has tried to place similar land uses next to existing land uses. For example, across the road from the Moana Resort complex will be similar multi-family units. The golf course will border most of the agricultural land on the project area boundaries.

The primary intent of this application with respect to land use is to propose that the development area be designated as a Project District. Of the 480 acres included in the development, about 47% will remain as open space, either as part of the golf course or actual park or open space. The remainder will be developed in various uses as shown on the Land Use Summary (Table 2, Volume 1).

#### IV. ANTICIPATED IMPACTS OF THE PROPOSED ACTION

Before the anticipated impacts are examined, it should be noted that all of the impact projections and calculations are based upon a conceptual or generalized land use plan which will be refined as the project progresses. The finding, therefore, should be viewed as order-of-magnitude approximations and general effects.

#### LAND TRANSFORMATION AND CONSTRUCTION

##### Extent of Developed Area

The total Moana Project area is approximately 480 acres and includes all of the land uses described in Project Description, Page . The majority of the land on site will be retained as open space, either unaltered or landscaped. When the golf course is excluded from the calculations for the percentages of different groundcover uses, a good idea of the character of the residential development can be obtained.

Table 5 presents a comparison of percentage ground cover between the proposed Moana Project without the golf course, a typical single-family dwelling subdivision and a typical multi-family dwelling development.

Type of Development: For 280 <sup>±</sup> ac. (excluding the golf course and park dedication)	5 units/acre Single-Family Dwelling Subdivision	20 units/acre Multi-Family Development
<u>Type of Coverage</u>	<u>Moana Project</u>	<u>Development</u>
Open Space	50	40-50
Buildings	36	40-50
Paved Area	14	10-20

### Extent of Earthwork and Imported Soil Requirements

The Moana Project site is very gently sloped (<3%) toward the shore; therefore, grading is not expected to be extensive or pose a great problem. Most of the fill material can be transported from other areas on-site. On some portions of the project site, there are clustered out-croppings of small boulders which will require removal. At the present time, it is difficult to say exactly how much earthwork will be required because the General Plan is still in a conceptual stage. However, it can be expected that more than 60% of the site will require some kind of earthwork preparation.

With respect to required topsoil, different methodologies were used to determine the actual amount required. For residential areas, the amount of paved area and building area including carports was tabulated for each residential acre. The total covered acreage was obtained and then subtracted from the total residential acreage to find the amount of uncovered area. A similar tabulation was done for the commercial center, the golf clubhouse, and the various accessways. The total uncovered acreage was then totaled. Because the soil on-site exhibits comparable characteristics as the soil on which structures are existing makai of Poipu Road, it was decided that on 30% of the uncovered acreage the soil is deep enough to be fertilized, thus not requiring any additional topsoil. This left 70% of the uncovered acreage requiring an average of 4 inches of topsoil. The total topsoil requirements for all project land uses other than the golf course are shown on Table 6.

The topsoil requirements for the golf course were obtained by calculating the amount of golf course acreage to be in roughs, fairways, and tees and greens. Typically, a golf course

TABLE 6

SUMMARY - TOPSOIL REQUIREMENTS  
(Excluding Golf Course)

Land Use	Total Acreage (Acres)	Requiring Topsoil (Acres)	70% of Land Requiring Topsoil (Acres)	Topsoil Requirement Cubic Yards
Single-family	100	59	41	21,877
Multi-family	120	65	45	24,168
Commercial Center	5	2	2	807
Park	20	-	-	-
Roads, Bicycle, Pedestrian, O.S.	35	12	8	4,469
Infrastructure	8	-	-	-
Tennis	10	-	-	-
Golf Clubhouse	<u>2</u>	<u>1</u>	<u>1</u>	<u>419</u>
Totals	300	139	97 <sup>2</sup>	51,740

<sup>1</sup> Assumption that 30% of land in residential/commercial areas will not require soil and can be fertilized.

<sup>2</sup> 97 acres at 4 inches of topsoil required.

requires 12 inches of topsoil for tees and greens and 9 inches of topsoil for fairways. Rough areas will remain in their natural condition or, where needed, fertilizer can be added. In applying these topsoil requirements, some 120,000+ cubic yards will be required in the construction of the golf course. The tabulation is shown in Table 7.

TABLE 7  
TOPSOIL REQUIREMENTS, GOLF COURSE

<u>Cover</u>	<u>9 in. Fairways</u>	<u>12 in. Tees and Greens</u>
Area	90 Ac.	7 Ac.
Cubic Yards	108,900	11,293

The total topsoil requirement is obtained by adding the residential topsoil requirement (51,740 cubic yards) to the golf course topsoil requirement (120,200 cubic yards). This gives a total of approximately 171,940 cubic yards of topsoil required for the entire project site. The topsoil will have to be imported from the Koloa area onto the site.

Other Required Site Material

Besides the soil requirements, it is important to know the amount of materials needed for the construction of roads, bicycleways, and pedestrian pathways. This information will be used in a later portion of this report to determine the daily number of trips and miles generated to obtain these materials; in turn, this information will be used in motor vehicle and noise emission calculations.

The materials to be considered are concrete, asphalt cement, and base course, which is usually some type of rock and sand aggregate used for the initial layer of a road. Concrete and asphalt cement are available in Lihue, and material for base course is available near Lawai. The standard cross-sectional composition of each type of accessway is necessary for material requirements. The composition of a roadway is 6 inches of base course covered with 2 inches of asphalt cement; for a bicycleway 4 inches of base course covered with 1.5 inches of asphalt cement is needed; and pedestrian walkways are 4 inches of concrete or asphalt cement, depending upon the slope, soil condition, and appropriateness of use.

For the Moana Project, there will be 30 acres of roadways, 6 acres of bicycleway, and 4 acres of pedestrian walkways (1 acre asphalt cement, 3 acre concrete). The resulting totals are:

<u>Material</u>	<u>Cubic Yards</u>
Concrete	1,597
Asphalt Cement	9,770
Base Course	27,394

Materials for actual dwelling unit construction were not estimated because the exact unit type and number of units have not been determined.

#### WATER RESOURCES

In this section, the effects of irrigation on the golf course, percolation of the irrigation water to the basal lens, and the impact of the basal flow to the sea will be dealt with. The

groundwater characteristics in the Koloa-Poipu vicinity are quite difficult to assay because of the complexity of the area's geology. The Koloa volcanic series overlies the Napali formation of the Waikomo series as explained in the previous section. However, between the Waikomo series and the Koloa series, there are deposits of both soil and coral sediment, creating an interface between two geologic series. The coral sediment layer is permeable, but the soil sediment layer is relatively impermeable. An accurate picture of the locations of the differing layers is not known; therefore, the actual impact to the basal water by percolating irrigation water is difficult to project.<sup>1</sup> Little data are known about the area because most of the wells for irrigation and domestic uses were drilled in a line near mountain aquifers north of the site. The shoreline shows little promise for use as a domestic groundwater source.<sup>2</sup>

Therefore, instead of trying to quantitatively estimate the impact of irrigation and fertilization of the golf course upon the basal lens, a comparative analysis between the site and adjacent agricultural uses will be examined, and related to existing coastal water quality data. This is a rougher method of estimating anticipated impacts of golf course irrigation and fertilization upon the basal lens and the coastal water, but is still considered valid for this study.

#### Impact of Irrigation and Fertilization of the Golf Course

Irrigation: The amount of irrigation required for the turfgrass on golf course tees, greens, fairways, and rough areas is the amount of water needed, in addition to the rainfall, to offset evaporation and to ensure that there is enough water for the grasses to transpire without any damage to the turfgrass. The

---

<sup>1</sup>Dr. Doak Cox, Environmental Center, University of Hawaii.

<sup>2</sup>Dan Davis, Groundwater Hydrologist, U.S. Geological Survey.

actual daily irrigation for the golf course will vary widely with the season, daily climatological conditions, and the irrigation habits of the groundkeepers. To get an approximate figure for water requirements, an average weekly irrigation demand of 0.43 million gallons per day (mgd) was used. This is based on calculations shown in Table 8. Note that in these calculations, the irrigation plus the rainfall minus the evaporation and transpiration is equal to the net percolation to the basal lens. The total amount of water applied to the golf course should approximate 2 in./acre/week for the tees, greens, fairways, and driving range; and 1 in./acre/week for the rough. For economic reasons, the percolate is kept to a minimum, if possible, unless there is a possibility of damage to the turf-grass.

As indicated above, the average irrigation requirement for the total golf course is estimated at 430,000 gallons per day (gpd), with an average daily percolation rate of 92,000 gpd. This percolate will probably filter through the ground to the upper brackish portion of the basal groundwater and then flow out to the sea with virtually no impact to the confined body of fresh water trapped in the Napali formation at an estimated 500+ feet below sea level.

Fertilization: To create the lush vegetation required for a golf course, heavy fertilization is a general practice. Rarely is the use of herbicides or pesticides employed; therefore, there will be no or very little contribution of these chemicals to the percolate into the basal groundwater.

According to Belt, Collins & Associates, landscape architects, fertilizers probably will be applied in the quantities shown in Table 9.

TABLE 8

EXPECTED DISPOSITION OF TOTAL WATER (IRRIGATION AND RAINFALL) APPLIED TO GOLF COURSE

	Average Quantity of Water - Inches/Week	
	97 Acres-Tees, Greens, Fairways, Driving Range	83 Acres Adjacent Rough
<u>Water Applied</u>		
Irrigation	1.05	0.25
Rainfall (3.8 in./mo.)	<u>0.95</u>	<u>0.95</u>
Total Applied	2.00	1.20
<u>Water Lost</u>		
Direct Evaporation (7% of ap. irr.)	0.07	0.02
Trans. by Bermuda grass (up to 100% Class A pan evap.)	<u>1.76</u>	<u>1.06</u>
Total Lost	1.83	1.08
Net Percolation	0.17	0.12

1. Irrigation Requirement - Average

$$1.05 \text{ in./wk.} = 0.15 \text{ in./day} = 0.012 \text{ ft./day} \times 43,560 \text{ ft.}^2/\text{ac.} \times 97 \text{ ac.} \times 7.48 \text{ gal/ft.}^3 = 0.38 \text{ mgd}$$

$$0.25 \text{ in./wk.} = 0.035 \text{ in./day} = 0.002 \text{ ft./day} \times 43,560 \text{ ft.}^2/\text{ac.} \times 83 \text{ ac.} \times 7.48 = \underline{0.05} \text{ mgd}$$

2. Total Percolate - Average

$$0.29 \text{ in./wk.} = 0.041 \text{ in./day} = .0034 \text{ ft./day} \times 43,560 \times 83 \times 7.48 = 92,000 \text{ gpd}$$

TABLE 9  
EXPECTED GOLF COURSE FERTILIZATION

Nutrient and Probable Carrier	Applications (lb/acre/yr)			Weighted Average Over 180 Acres <sup>1</sup>
	On Greens (4 Acres)	On Tees (3 Acres)	On Fairways and Driving Range (87 Acres)	
Nitrogen as weight of N in the carrier	750	540	280	230
Nitrogen carrier Urea CO (NH <sub>2</sub> ) <sub>2</sub>	1,730	1,200	620	510
Phosphorous as weight of P in the carrier	195	135	70	60
Phosphorous carrier, triple superphosphate 8P 2O 5-Ca(H <sub>2</sub> PO <sub>4</sub> ) - 10 Ca SO <sub>4</sub>	885	615	320	260
Potassium as weight of K in carrier	390	270	140	115
Potassium carrier, Potash K <sub>2</sub> CO <sub>3</sub>	780	540	280	295

<sup>1</sup>Three acres within the course will be sand traps which will not be fertilized.

The three major fertilizer nutrients -- nitrogen, phosphorous, and potassium -- are likely to be applied on the golf course in the weight ratio of four parts nitrogen, one part phosphorous, and two parts potassium. (Initially, relatively higher amounts of phosphorous and potassium will be added. Since this will be for several months only, the focus here will be on the long-term impact that the regular fertilization schedule will have).

The impact to the receiving basal groundwater will not be discussed because the receiving groundwater is highly saline and is not a domestic water source anywhere in the region. Therefore, the impact is expected not to affect any important fresh water sources.

#### Impact on Coastal Waters

The percolating water will carry with it some of the chemicals contained in the fertilizer to the basal lens. Then the mixture of percolate will further mix with the brackish groundwater and flow out to the ocean. It is difficult to project the exact concentrations in the basal lens of chemicals, how the chemicals will mix, and how the discharge to the ocean will affect the coastal water quality.

However, to the immediate west of the project site is land owned by McBryde Sugar Co., Ltd. McBryde Sugar owns more than 13,000 acres of land, of which approximately half is under cultivation and the other half is harvested yearly. One sugarcane crop in Hawaii averages a two-year period from planting to harvest.<sup>1</sup> The range of yearly requirements for fertilization of sugarcane lands is shown in Table 10.

---

<sup>1</sup>Reference 16, pp. 5-7.

TABLE 10  
YEARLY FERTILIZER REQUIREMENTS, SUGARCANE<sup>1</sup>

Nutrient and Probable Carrier	Applications (lb/acre/yr)
Nitrogen as weight in N in the carrier	250-400
Nitrogen carrier Urea (CO NH <sub>2</sub> ) <sub>2</sub>	580-930
Phosphorous as weight of P in the carrier	46- 86
Phosphorous carrier, triple super phosphate 8P <sub>x</sub> 05 - Ca (H <sub>2</sub> PO <sub>4</sub> ) - 10 CaSO <sub>4</sub>	195-390
Potassium as weight of K in carrier	68-136
Potassium Carrier - Potash K <sub>2</sub> CO <sub>3</sub>	135-270

<sup>1</sup>Reference 20, p. 23.

These figures can be compared with the amount of fertilization required for the golf course. It can be seen that on an overall per acre per year basis, the golf course and the sugarcane fields may require similar amounts of fertilization; although for specific golf course uses, such as tees and greens, required fertilization will be much more than what is necessary for the sugarcane fields. On a quantity basis, much more nutrient material is used for cultivation than will be used on the Moana Project; however, the coastal water is still in the range of class AA water.

The major contributors to the impact to groundwater and coastal water are nitrogen and phosphorous compounds. The different soil types on adjacent agricultural lands and on the site will have some effect on the percolation of irrigation water and nutrients to the basal lens. The agricultural land has at least 3 feet of topsoil, as opposed to 20 inches or less of topsoil on the project site. The soil on the agricultural land will retain nutrients longer, while more percolate will reach the

basal lens from the poor soil on-site. On the other hand, turf-grass root systems are extensive and hold nutrients in soil better than sugarcane. It should be noted that the concentrations of nutrients other than nitrogen are minute and will not have an impact on coastal waters. Nitrogen is highly soluble and will not be retained in the soil. It should be expected that 10% to 15% of the applied nitrogen will percolate to the basal lens and have an impact on coastal water. Phosphorous is highly insoluble and is retained in the soil for use by ongoing plant life.

#### Impact of Irrigation and Fertilization of Other Landscaped Areas

To obtain a complete picture of the irrigation and fertilization impacts for the Moana Project, it is necessary to examine the irrigation and fertilization requirements of areas other than the golf course primarily in the residential areas. From the table of topsoil requirements (excluding the golf course), all of the areas requiring topsoil will also require irrigation and fertilization. At the completion of the Moana Project, this will mean approximately 139 areas.

It is expected that this land will be irrigated mainly from the domestic water supply for two reasons. First, the type of grass and ornamentals probably will not be hardy enough to be able to stand the salt content of brackish water. Second, the treated sewage effluent to be generated at the project completion will be used principally for the irrigation of the golf course, with little, if any, available for landscape irrigation.

It is assumed that the average watering for this acreage will be about 1 inch per week; additional water requirements will normally be supplied by natural rainfall. It is recognized

that irrigation practices will vary widely with the individual homeowner, but over the entire project the variations should average out. The landscaped areas will, therefore, require approximately 0.53 mgd of irrigation with a percolation rate of 63,400 gpd, as shown in Table 11.

TABLE 11

EXPECTED DISPOSITION OF TOTAL WATER (IRRIGATION AND RAINFALL)  
APPLIED TO LANDSCAPED AREAS (OTHER THAN THE GOLF COURSE)

	<u>Average Quantity of Water - Inches/Week</u>
<b>Water Applied</b>	
Irrigation	1.00
Rainfall (3.8 inches/month)	<u>0.95</u>
<b>Total Applied</b>	<b>1.95</b>
<b>Water Lost</b>	
Direct Evaporation (7% of applied irrigation)	0.07
Transpiration by grasses and ornamentals (up to 100% Class A pan evaporation)	<u>1.76</u>
<b>Total Lost</b>	<u><b>1.83</b></u>
<b>Net Percolation</b>	<b>0.12</b>

1. Average Irrigation Requirement:

$$1.00 \text{ in/wk} = 0.142 \text{ in/da} = .0118 \text{ ft/da} \times 43,560 \times 139 \times 7.48 =$$

$$0.53 \text{ mgd}$$

2. Average Percolate:

$$0.12 \text{ in/wk} = 0.017 \text{ in/da} = .0014 \times 43,560 \times 139 \times 7.48 =$$

$$63,400 \text{ gpd}$$

The probable "hit and miss" fertilizer applications will be approximated here by assuming that a mixed 15-15-15 fertilizer will be applied at 1-lb/100 sq.ft. every three months. Mixed fertilizers contain all three of the major nutrients, most likely as combinations of  $(\text{NH}_4)_3\text{PO}_4$ ,  $\text{NH}_4\text{NO}_3$ , and  $\text{K}_2\text{O}$ . The 15-15-15 designation designates the percentage by weight of elemental nitrogen, phosphorous as phosphoric oxide ( $\text{P}_2\text{O}_5$ ), and potassium as potash ( $\text{K}_2\text{O}$ ). Resulting nutrient application rates would be as shown in Table 12.

TABLE 12  
FERTILIZATION IN LANDSCAPED AREAS OTHER THAN THE GOLF COURSE

<u>Nutrient and Carrier</u>	<u>Application (lb/ac/yr)</u>
Total of element Nitrogen	260
Nitrogen in $\text{NH}^{+4}$	207
Nitrogen in $\text{NO}^{-3}$	53
Total of element Phosphorous, all in $\text{PO}_4$	114
Total of element Potassium, all in $\text{K}_2\text{O}$	216

Based upon the same assumptions used in the impact of the fertilization of the golf course and agricultural lands, it is felt that the effect of the fertilization upon the coastal water quality will be small. Again, it should be noted that nitrogen will have the greatest impact on the coastal water quality, as it is applied in the greatest quantities during fertilization of open areas.

#### BIOLOGICAL ASPECTS

##### Impact on Terrestrial Plant Life

As explained in the Physical Setting segment of this Volume, the site is predominated by haole koa and other minimum value scrub bushes and weeds. With the initiation of the construction of

the Moana Project, the mass grading and soil conditioning that will be necessary will eliminate much of this vegetation. The surface rockiness will be reduced, rocks will be bulldozed away, and new soil will be added to this area. Irrigation and landscaping will change the basic color of the site from its red-brown-grayish appearance to predominantly a green area as new landscaping begins to flourish. The only places that the existing vegetation will be virtually untouched will be the golf course rough areas. However, for the sake of visual attractiveness, these areas may also be landscaped. In addition, the introduction of coconut palm and other trees will change the visual character of the area by increasing the height of the tallest vegetation. Ornaments near the building units will change the visual character of the area by increasing the height of the tallest vegetation. Ornaments near the building units will also be used, such as bougainvillea, succulents, and plumerias. All in all, new introduced vegetation will be used to create and enhance the visual appearance quality of the environment. Moana Corporation's Kiahuna Condominiums makai of Poipu Road has received praise for its sensitive treatment of landscaping and buildings, and can be thought of as a smaller scale model of the proposed 480<sup>±</sup> acre Moana Project.

#### Impact on Existing Animal Life

During the project construction phase, earthmoving, mass grading, dust, and noise generated from heavy machinery will probably encourage most of the on-site animal life to migrate to adjacent undisturbed land. Fortunately, there are no endangered species of animals on the site which will be adversely affected.

At the termination of construction and completion of landscaping, much of this animal life will probably return to the site. Rodents and other small field animals will inhabit brush and grass areas.

Other animals such as mongoose may choose to stay in the less developed areas to avoid contact with humans. Many bird species that are relatively unaffected by human contact will return to the area (doves, sparrows, finches, cardinals, jarks, plovers). Others may choose to remain in the wilder, agricultural or open space areas (herons, owls). In this region, there is plenty of undeveloped land which will suit these conditions as most of the land around Koloa, Lawai, and Kalaheo are in agriculture or conservation districts as set forth by the State of Hawaii.

It is certainly conceivable that with the extensive new landscaping, the site will attract greater quantities of birds, especially those attracted to flower and berry bearing trees and shrubs.

#### ARCHEOLOGICAL SITES

Moana Corporation has submitted, under separate cover, a study entitled Archaeological Reconnaissance Survey of Knudsen Trust Lands at Koloa, Poipu, Kauai, conducted by the Bishop Museum in June, 1975. The survey consisted of an on-site inspection to determine the presence and extent of archeological sites. It did not include the detailed recording of archeological sites, their locations, or research into their origins and uses. These aspects are to be covered in later phases of the archeological investigation.

The survey indicated a substantial number of relatively undisturbed archeological sites within the southern and eastern portions of the project area. The sites appear to be the remains

of "an extensive agricultural complex that at one time stretched from the present Koloa town area to the coast."<sup>1</sup>

In a letter to the Kauai Planning Commission dated August 20, 1975, Moana Corporation states its intention to preserve the significant archeological remains in the project area. When the exact locations and significance of the sites have been determined, the land use and circulation plan will be revised to reflect their presence.

It should also be noted that there are significant archeological sites including a large heiau within the area to be dedicated to the County for expansion of Poipu Beach Park. These sites have been incorporated into the County's preliminary park improvement plans for the expansion area.

#### VISUAL CHARACTER

##### Present Visual Character

The lack of adequate precipitation governs the existing visual character of the proposed project site. As indicated previously, the general overall colors of the site are blends of reds, grays, and browns. The site is predominated by haole koa and other types of scrubby vegetation which give a very dry appearance most of the year. The pasture areas are also very dry, and there are rock outcrops and remnants of old walls scattered throughout the site. The site cannot readily be seen from Poipu Road, as there is a curtain of vegetation which prevents this. This land presently lacks any visual definition.

##### Visual Character Changes within the Project Development

There are at least four effects which are foreseen as major alternatives to the existing project site. They are: the

---

<sup>1</sup>Reference 21.

removal of existing vegetation, grading of the site, the construction of various buildings and access ways, and landscaping.

- o The removal of existing vegetation is necessary for most of the project site. Much of the existing vegetation has very little value and is predominantly weeds. Removal of this vegetation will aid in grading and building of the site. The only vegetation that will be left intact will be on the portions of the site that will be used for the golf course rough adjacent to the fairways and along certain drainage courses.
- o Grading of the site will be needed in the construction of building pads, golf course contouring, and for general site layout. The natural contour of the land slopes approximately 3% towards the shore. Grading may be used to make the residential areas as unobtrusive as possible while enhancing the layout of the golf course by giving each hole a character of its own. Grading not only will improve the lay of the site but will also improve the vistas from dwellings within the site.
- o Once the grading has been finished and vegetation removed where deemed necessary, the building phase of the project will proceed.

As expressed in the land use plan, the developer has situated the medium density housing areas adjacent to Poipu Road along the southern boundary of the project. This was done so that they would be contiguous with similar developments makai of the road. In like fashion, the low-density, single-family units are distributed along the boundaries of the project which border sugarcane fields. All of the housing areas have a good view

to the golf course with the exception of that portion of land east of Hapa Road. However, that piece of land has a good view corridor to the tennis complex and the Poipu Beach park dedication area.

The prime considerations for the design of the building structures are grouping of the structures, actual building form, building color, and building height. For the Moana Project, the multi-family dwelling units will be arranged in a cluster fashion, thereby concentrating the living areas and allowing more land to remain as open space. The single-family units will be built within individual lots, similar to a typical subdivision, except all of the houses will front or be very close of the golf course. The multi-family buildings will be comparable to the existing buildings makai of Poipu Road -- frame structures with a Polynesian-style facade and roof.

It is anticipated that the buildings will be painted or stained earth colors (greens, tans, browns, etc.) for two reasons: (1) so that the building will blend into the surrounding environment, thus preserving the rural character of the site; and (2) so that the building structures will not distract golfers, as the golf course circumscribes the development. Buildings will not be higher than three stories and, therefore, will not be visually prominent. This effect will be enhanced by landscaping.

- o Landscaping is a prime cause of visual change on the project site. With the proper irrigation, the color of the project will change from predominantly brown to predominantly green. Landscaping will enhance the

site tremendously by providing trees which are badly needed for shade and to create visual relief and by making the golf course a thing of beauty. Landscaping will also prevent sheet runoff during heavy rainfall due to the water retention capabilities of the introduced vegetation. Trees and shrubs also may be used to create striking vistas within the project site. Lastly, the new vegetation may attract many species of birds to nest on the site, thus making the environment truly pleasant.

- o The amount of space to be used for roadways and walkways has been estimated as 40 acres -- 15 acres of major roads, 15 acres of minor roads, 6 acres for bicycleways, and 3 acres of pedestrian walkways. To keep the nature of this project low key, underground utility lines will be used. Also for street lighting, alternatives to normal urban lighting systems will be used to preserve the general rural character of the project. Perhaps lightly within the curbs or waist high lighting will be employed for this purpose.

Moana Corporation's Kiahuna Condominium project, which is located makai of Poipu Road, has received praise from both private individuals and various government officials for its sensitive landscaping and development. The same awareness of the surroundings should ensure that the proposed 480-acre increment will not only be appropriate, but its visual character will greatly enhance the existing site.

#### Visual Changes on a Regional Basis

From various elevated vantage points surrounding the site (knolls and ridges), one can see that the project site is covered with

haole koa and other scrubby vegetation, with no physical development. The Weliweli subdivision is to the east of the project site and runs perpendicular to the coastline. Because this is a State housing development, the Weliweli subdivision indicates a governmental desire for development in this area. In addition, the County has expressed that development perpendicular to the coastline rather than along the coastline is more beneficial and desirable to the regional land use pattern. This would be similar to the ahupua'a, the ancient Hawaiian land division, which was a wedge-shaped tract of land from the coastline to the mountains.

The rural profile of the area will be maintained by the golf course with the multi-story units built adjacent to Poipu Road, and the single-story units adjacent to the golf course, agriculture, and the existing subdivision.

#### INFRASTRUCTURE

##### Domestic Water

The proposed development on the Knudsen Trust lands is estimated to produce an annual average day domestic water demand of 0.592 mgd. This was determined from the following usage criteria:

Single-family residential	--	500 gallons per day per unit;
Multi-family residential	--	350 gallons per day per unit;
Commercial and Clubs	--	5,000 gallons per day per acre.

These unit flows were based in part from a study done at Kaanapali Resort by Belt, Collins & Associates and unit flows used by the Honolulu Board of Water Supply. The additional requirement means that the estimated ultimate average demand in the Kauai General

Plan will need to be increased from 2.71 mgd to 3.30 mgd for the Poipu area. The increase will require the following changes in the domestic water general plan:

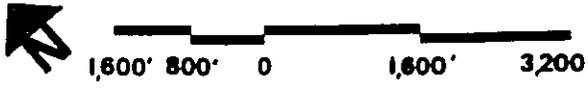
- o An additional source will have to be developed.
- o The primary transmission flow alignment from the County's proposed 1.0 mg Puuiwa reservoir will have to be redirected and extended in order to incorporate the proposed development.

The 1.0 mg Puuiwa reservoir system is to be added in order to provide adequate fire protection for the Poipu area. No increase in the planned reservoir capacity is required because of reduction in the required fire flow duration from 6 to 2 hours. This is one of the principal changes in the revised grading schedule that has been completed by the Municipal Survey Service Unit of the Insurance Services Office.

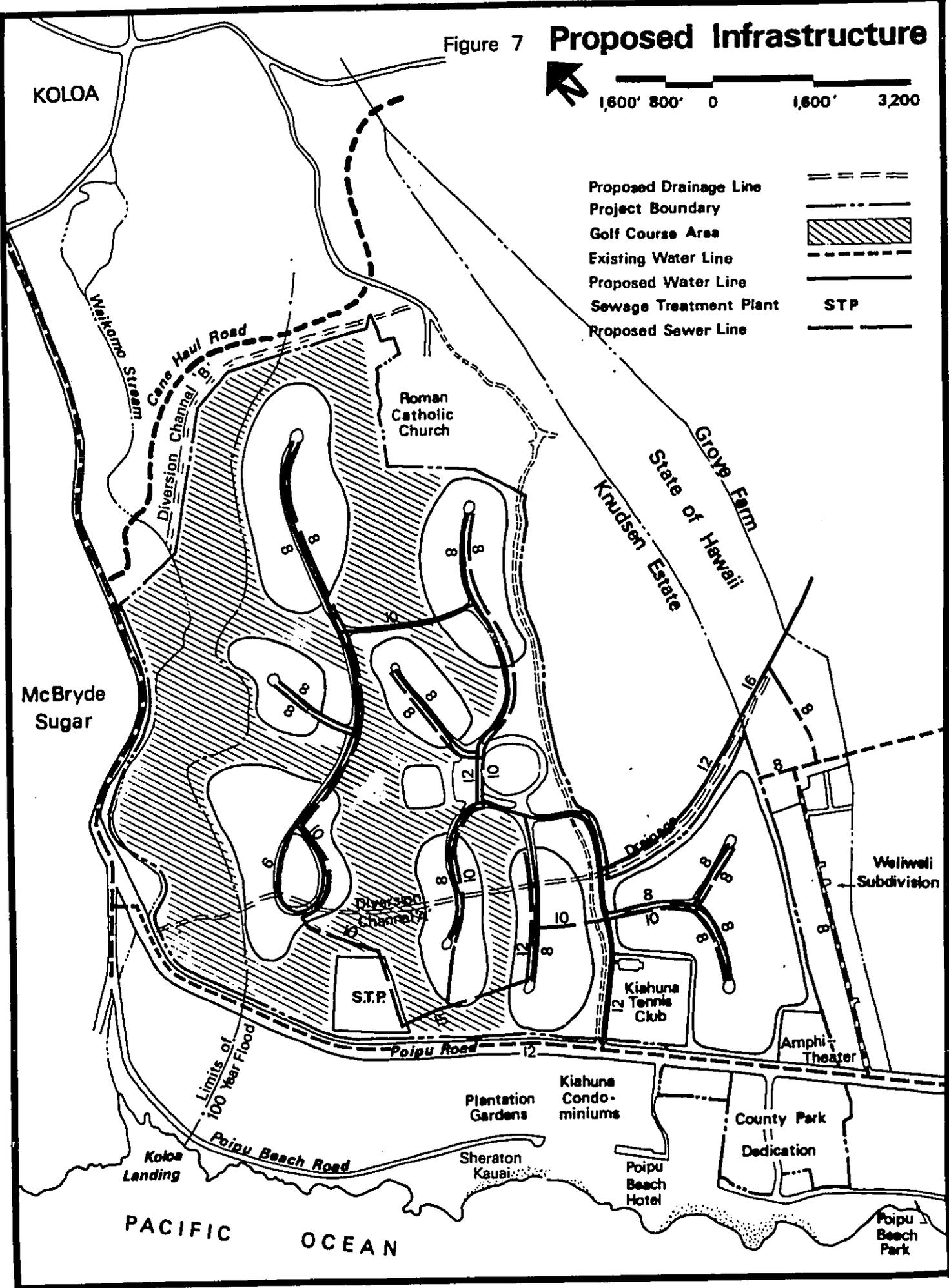
Irrigation water for the proposed 18-hole golf course will be obtained from on-site brackish wells and treated sewage effluent. The County's domestic water system will not be used. Preliminary indications from information available on existing wells and general ground conditions are that sufficient water (1.0 mgd) of adequate quality (less than 300 ppm of chlorides) can be obtained from wells along the Waikomo Stream basin.

The internal on-site water system shown in Figure 7 will consist of a network of 12-, 10-, and 8-inch distribution mains with fire hydrants located to furnish local fire protection. The mains are sized primarily to transmit fire flows. Fire flows are based on the Honolulu Board of Water Supply requirements of 1,000 gpm for one hour for single-family structures and 2,000 gpm for two hours for schools, small shopping centers, hotels, and high rises. The required residual pressure of 20 psi at hydrants will be provided.

Figure 7 **Proposed Infrastructure**



- Proposed Drainage Line
- Project Boundary
- Golf Course Area
- Existing Water Line
- Proposed Water Line
- Sewage Treatment Plant **STP**
- Proposed Sewer Line



Moana Corporation will participate in the current source development program to be undertaken by the Board of Water Supply for the Poipu area. It is expected that this source will supply the domestic needs of the proposed development.

The proposed source expansion for the area will serve Moana as well as other proposed developments in the Poipu area. Funds have been appropriated and other funds may be necessary before this additional source is developed. It is expected that additional necessary funds will come from developers in this area.

#### Sewer Availability

The proposed Knudsen Trust land development would produce an ultimate average flow of 0.466 mgd of sewage. The estimated flow was determined under the criteria of sewage flow being 80% of the water demand. In terms of land use, sewage flows would be 400 gpd per unit for single-family residential and 300 gpd per unit for multi-family residential. Golf course flows were determined by assuming an attendance of 500 persons of 15 gpd per person with an added assessment of 5,000 gpd for clubhouse activities. The City and County of Honolulu Design Standards were used to derive 4,000 gpd per acre for commercial and club zones.

The sewage collection and disposal system for the proposed development will be contained completely within the project site mauka of the Poipu Road except for the makai three-acre condominium development. The collection system as shown on Figure 7 will consist of a network of 8-, 10-, 12-, and 15-inch gravity mains terminating at the existing sewage treatment plant site along the mauka edge of Poipu Road. The existing sewage treatment plant is a private system presently serving the Kiahuna

Condominium development makai of Poipu Road. The capacity of the package unit is 75,000 gpd with tertiary treatment. The new development will require 0.466 mgd of additional sewage treatment capacity. The required additional capacity can be constructed at the present plant site just mauka of Poipu Road. The wastewater treatment plant and effluent disposal system will be designed to meet all State Department of Health standards.

The system will be privately owned; the by-products of effluent and sludge are proposed to be used on-site. It is proposed that the County operate the system with funds for its operation being provided by Moana and other developers who may utilize the plant.

#### Drainage

The development site contributes storm runoff from the area mauka of Poipu Road to the makai flood-prone areas along the old Poipu Beach Road. The flood problems have been well-documented in numerous studies, among them the Flood Plain Information Study, Koloa-Poipu, Kauai, Hawaii, by the U.S. Army Corps of Engineers, and the Flood Insurance Study, Type 15 - Koloa-Poipu Vicinity, Kauai, Hawaii, by R. M. Towill Corp. for the Federal Insurance Administration. The proposed development may increase the flood problem in these coastal areas. To reduce this problem, two diversion channels are proposed, as shown in Figure 7 -- Channel "A" in the lower region between elevations 60 and 100 feet and Channel "B" between elevations 120 to 150 feet.

Channel "A" will be about 4,600 feet long beginning at the Weliweli House Lots on the east boundary of the site traveling west across Hapa Road until it intersects Waikomo Stream just above

Poipu Road. The channel drainage area encompasses some 345 acres. The ultimate tributary area is expected to include an additional 500 acres above a future extension of Channel "A" for some 3,000 to 4,000 feet along Weliweli Road. The peak design discharge will therefore be based upon a total of 845 acres. The peak discharge for a 50-year recurrence interval is 2,800 cfs and for a 100-year recurrence interval is 3,900 cfs. The discharge rates were obtained from Plate 6 and 6A, Storm Drainage Standards, Department of Public Works, County of Kauai, February, 1972, pages 19 and 20. The diversion channel, including the future extension, is similar in concept to that proposed in the General Plans - Water, Sewerage and Drainage, County of Kauai, August, 1963, and by the Soil Conservation Service in A First Approximation of Costs for Poipu Watershed, October, 1972.

Channel "A" will be designed to handle the 50-year design storm at a peak discharge of 2,800 cfs. The channel will have a trapezoidal or rectangular lined section. Should the alignment pass through open or golf course lands, the channel will be most likely grassed. Several road crossing structures will be required. The diversion at Channel "A" will significantly reduce the storm runoff tributary area and therefore the amount of flood water reaching the flood-prone areas along the old Poipu Beach Road. The total present tributary area affected by the development site is some 1,025 acres, of which waters from 522 acres will be diverted by Channel "A". This results in a 51% reduction in tributary area by Channel "A". The determination of the actual amounts of reduced surface runoff requires extensive hydraulic analysis and is not within the scope of this discussion. A corresponding reduction in the runoff can be expected, however.

Diversion Channel "B" will be about 3,800 feet long beginning at the Catholic Church and intersecting Waikomo Stream 500 feet downstream from the cane haul road bridge. Channel "B" will

serve to divert runoff around the development site. The drainage area affected is approximately 165 acres, with peak discharge rates of 600 cfs and 800 cfs for 50-year and 100-year recurrence intervals, respectively. (Plate 6 and 6A, Storm Drainage Standards, Department of Public Works, County of Kauai, February, 1972, pages 19 and 20.)

The internal on-site drainage system will consist of swales to channelize runoff through open and golf course lands and, where required, subsurface storm drain systems constructed to applicable standards. Diversion Channel "A" will be utilized as much as possible to collect runoff and to discharge waters into Waikomo Stream. Those areas below Channel "A" will be channelized to existing culverts crossing Poipu Road.

The diversion of storm waters to Waikomo Stream may mean an increase in the flood storage level for the stream bed depending upon the rainfall distribution over the entire stream tributary basin. The present drainage area is about 10.4 square miles, with peak discharge rates of 15,700 cfs and 18,200 cfs for 50- and 100-year recurrence intervals. (See Table 1 of the Flood Plain Information Study, Koloa-Poipu.) Diversion Channels "A" and "B" will increase the drainage area by 0.80 square miles with discharge rates of 1,800 and 2,500 cfs for 50- and 100-year recurrence intervals, respectively. The inclusion of the Channel "A" extension, involving another 500 acres, would mean a total additional tributary area of 1.6 square miles with 3,400 and 4,700 cfs peak flows for 50- and 100-year return periods, respectively.

Studies by the U.S. Army Corps of Engineers state that the lower reaches of Waikomo Stream do not have the capacity for the 100-year frequency flood and that the culverts (7,000 cfs capacity)

at Poipu Road are already inadequate for any unusual storm. Improvements are needed along Waikomo Stream whether the development occurs or not. The development area affected by the 100-year frequency storm will be assigned to open or golf course use.

#### Power and Communications

The average monthly electrical consumption per dwelling unit on Kauai is 405 kwh according to Kauai Electric Co. Therefore, 1,450 new units would require over 587,000 kwh of additional power per month with a maximum demand of 1,175 kw. However, since the units are to be constructed incrementally over a 20-year period, the increased load is not expected to overburden the Company's anticipated island-wide expansion program.

The permanent on-site primary electrical distribution system will consist of 12.47 KV circuit conductors pulled into concrete encased underground ducts and manholes. These electric circuits will emanate from a substation which will be owned and operated by Kauai Electric Co. Power distribution cables within the project will be owned and maintained by Kauai Electric Co. or located within rights-of-way dedicated to the County.

Residential and apartment sites not requiring three-phase power will be served from 7.2 KV single-phase cables. Commercial centers will be served with dual three-phase 12.47 KV feeders.

Street lighting on any dedicated road will be constructed to Kauai County Standards.

Telephone service will be provided by Hawaiian Telephone Co. in accordance with their tariff structure. Basically, this means that the only costs for the developer are the installation of

an underground duct and manhole system suitable to the telephone company. Telephone manholes must be separate from both power and TV manholes; however, concrete encased duct sections may contain power, telephone, and TV ducts within the same duct section.

A television duct and handhole system will be installed to provide facilities for a future TV cable system.

#### TRANSPORTATION - TRAFFIC IMPACT<sup>1</sup>

The main impact on transportation facilities by the Moana Project will be caused by increased generation of vehicular traffic. Air and sea transportation will not be greatly affected since there appears to be ample capacity to accommodate future requirements.

##### Introduction

The Moana Project will create additional traffic on corridors in the vicinity of the Koloa-Poipu area. Because of the importance of the traffic question in considering the Moana Project, specific data was generated to project the travel habits of future project occupants. To generate such project-specific data, a survey was conducted in September, 1975 among the guests at Moana Corporation's present Kiahuna Condominium project, regarding their travel patterns. The Kiahuna Project is directly across Poipu Road from the proposed Moana Project site.

The Kiahuna guests were asked to state the number of automobile trips they had taken off-site during their visit, the purpose of their trips, the number of persons per vehicle, and other pertinent information. Their answers reflected their actual travel behavior under existing conditions.

---

<sup>1</sup>The Traffic Impact section was prepared by McDonald & Smart, Inc. and is based on a survey of traffic patterns conducted by that firm in September, 1975.

The guests then were asked to estimate the frequency of automobile trips they would take off-site if the development included the recreational and shopping amenities planned for the Moana Project.

From this data, the amount of additional off-site traffic to be generated by future residents of the Moana project was estimated.

The survey results were notable in two respects:

- o The actual number of off-site vehicle trips of guests residing at the Kiahuna Project is significantly lower than expected, in comparison with other similar areas and types of projects in Kauai.
- o The estimated off-site trips would drop substantially if the proposed amenities existed.

These findings are consistent with other comprehensively planned, recreation-oriented communities with extensive, high-quality recreational amenities on-site. The off-site travel of occupants of such communities is so much lower than that of the population at large that McDonald & Smart, Inc. has coined the phrase "containment factor" to refer to such a project's ability to contain people on-site.

The Moana Project will have an extremely high containment potential, which is clear from the survey responses as well as from a review of the planned amenities. The more facilities a development has on-site, the less off-site traffic that development will generate.

The project will contain a broad range of quality recreational facilities on-site, including swimming pools, tennis courts with a clubhouse, a championship 18-hole golf course with a clubhouse, bicycle and pedestrian pathways, and close proximity to an ocean beach. Moana Corporation plans to provide transportation between the project and the beach by jitney bus, thereby eliminating the need to use cars. The development will provide direct pedestrian and internal access for its occupants to the principal outdoor recreational activities which attract travelers to Kauai. The only major recreational activity which is not available on-site is an island tour. For most visitors, such a tour usually generates just one trip off-site, or occasionally two, during a given visit. Hence, as confirmed by the survey, it can be expected that most Moana Project guests would take only one or two off-site recreation trips during a week's stay.

In addition to the recreational amenities, the Moana Project also will include an on-site convenience shopping center, run by local businessmen, which will include a grocery store, liquor store, and sporting goods store. Except for an occasional major shopping trip to a large market, there will be little need for a project occupant to travel off-site to fill his daily needs. As indicated by the survey, this convenience center will further increase the Project's containment potential and reduce off-site travel.

#### Project Area Roads and Circulation<sup>1</sup>

The Project area is bounded on the west and south by Poipu Road, which is the main traffic corridor from Poipu Beach to Kauai's

---

<sup>1</sup>Belt, Collins & Associates, Ltd.

urban centers. Koloa is north of the Project, and Lihue is approximately ten miles northeast to Koloa. Poipu Road, which replaced the old Poipu Beach Road as the main arterial, has a 120-foot right-of-way. However, at this time, only a two-lane road which terminates at the Weliweli subdivision has been constructed within this right-of-way. Poipu Road serves the Sheraton Kauai, Plantation Gardens, Poipu Beach Hotel, Kiahuna Resort Complex, Waiohai Hotel, and the Poipu Beach Park, in addition to a few house lots on the beach and the Weliweli subdivision. Proposed for the future is a major road from Koloa to Poipu along the Knudsen Trusts-State of Hawaii property boundary to connect into Poipu Road which thus would create better regional circulation.

There is one vehicular entrance to the development area located on the mauka side of Poipu Road. The intent is to discourage any through and unnecessary traffic within the development. The internal street system has been designed with gentle curves utilizing minimum pavement widths in order to emphasize the informal setting and minimize the visual impact of the roadway within the development. Because the commercial area and golf clubhouse are the central activity nodes within the Project, most of the residential collector streets lead to this area. Since the main access road also leads to these central facilities, most residents and visitors will pass by the area as they come and go from the development.

#### Number of Vehicles Projected

The latest traffic volume data available for Poipu Road was taken by the County of Kauai over a four-day period in August, 1972. However, an analysis of other traffic counts in the

area indicated that these figures were abnormally high. Using the Traffic Summary for the Island of Kauai (State of Hawaii, Department of Transportation) in 1971, 1970, and 1969, yearly traffic volume increase percentages were derived from Kaunualii Highway and Kuhio Highway, and applied to Poipu Road. It was decided that a 12% increase per year was not unreasonable for Poipu Road. Projecting the 1971 figures to 1975, the total two-way volume was estimated to be 7,772 vehicles per day. This total volume has been split over a 24-hour period using hourly volume percentages derived from the 1972 Kauai County traffic study. (See Table 13.)

It is important to note that the traffic on Poipu Road does not exhibit characteristics typical of any urban area. Note that the traffic seems to build up to a "peak" in the afternoon, instead of having a morning peak and an afternoon peak. This is because Poipu Beach is a resort/vacation area; therefore, traffic volume on Poipu Road is more dependent upon incoming and outgoing tourist traffic than on an urban work force traffic.

In projecting traffic generated by the proposed development, the following assumptions have been made:

---

DAILY POPULATION FIGURES FOR THE COMPLETED DEVELOPMENT

	<u>Average</u>	<u>Maximum</u>
Full-time residents	834	834
Part-time residents	488	1,950
Visitors	1,366	1,950
Employees	390	390

Source: McDonald & Smart, Inc.

---

TABLE 13  
TWO-WAY TRAFFIC VOLUMES FOR POIPU ROAD

<u>Hour</u>	<u>Percentages</u> <sup>1</sup>	<u>Estimated Hourly Traffic</u>
1 a.m.	1.2	93
2	0.6	47
3	0.3	23
4	0.2	16
5	0.2	16
6	0.1	8
7	1.1	86
8	2.7	210
9	3.8	295
10	4.8	373
11	6.2	482
12	6.3	490
1 p.m.	6.8	528
2	7.4	575
3	7.3	567
4	8.2	637
5	8.2	637
6	8.2	637
7	7.1	552
8	6.0	466
9	4.5	350
10	3.7	288
11	3.0	233
12	2.1	163
	100.0%	7,772 <sup>2</sup>

<sup>1</sup>Derived from 1972 Kauai County traffic counts.

<sup>2</sup>Projected from 1969-1971 average daily traffic (ADT) for Poipu Road and the Koloa-Poipu region from Traffic Summary, Island of Kauai, 1971, State of Hawaii, Department of Transportation, Highways Division, 1972.

The population figures are based upon assumptions as to average occupancy rates and average number of persons per dwelling unit multiplied by the number of units. Maximum population was determined by assuming 100% occupancy of all units at one time. These figures are shown in Table 14.

#### Methodology for Determining Vehicle Trips Per Day

The number of trips<sup>1</sup> made per day by various categories of trip generators were assumed to be:

Full-time residents (excludes retired persons)	4.00
Employees	2.00
Part-time residents, visitors (includes retired persons living full time in the project)	1.50

The figure for full-time residents was derived by assuming that a household would make two job-related trips per day -- one trip to work and one from work -- and two shopping and/or recreation trips. It was further assumed that half of the full-time residents would be retirees and thus would have the same travel behavior patterns as part-time residents and visitors. Project employees were assumed to make two trips per day -- one trip to work and one from work. The number of trips made per day by part-time residents and visitors was based on the survey of actual travel patterns of Kiahuna guests. The pattern of travel behavior by current Kiahuna visitors was assumed to be the pattern that can be expected of visitors to the proposed Moana Project.

The survey also queried the respondents as to the number of trips they would anticipate making should the Moana Project include the amenities described elsewhere in this section. The survey results

---

<sup>1</sup> It is important to note that the figures include two trips every time an occupant leaves the property - one trip for leaving and one trip for returning. In other words, the number of times vehicles leave the property is half the number of vehicle trips shown in this analysis.

TABLE 14

POPULATION PER DWELLING UNIT<sup>1</sup>

	Average Occupancy Rate	Average Persons Per Dwelling Unit	Number of Units	Total Average Estimated Population <u>Maximum</u> <u>Average</u>
<b>Single-Family Units</b>				
Net Resident Population <sup>2</sup>	100%	2.5	180	450
Current Resident Population <sup>3</sup>	100%	3.2	120	384
<b>Multi-Family Units (Single-Owner/Non-Resident Population)</b>				
One-Bedroom	25%	3.0	425	1,275
Two-Bedroom	25%	4.5	150	675
<b>Multi-Family Units (Rental Pool/Non-Resident Population)</b>				
One-Bedroom	70%	3.0	425	1,275
Two Bedroom	70%	4.5	150	675
Total			1,450	4,734
				2,688

<sup>1</sup>McDonald & Smart, Inc.

<sup>2</sup>Net resident population refers to actual new residents to Kauai who purchase and develop a Moana Project houselot.

<sup>3</sup>Current resident population refers to current residents of Kauai who purchase and develop a Moana Project houselot.

show a dramatic decrease in the number of trips per day -- from 1.50 to 0.68 person trips per day -- and demonstrate the ability of the proposed development's amenities to contain the part-time residents and visitors on-site.

The average number of persons per vehicle was assumed to be 1.50 for full-time residents and 1.25 for employees. The figure for full-time residents was based on a combination of two job-related trips per day and two recreation/shopping trips per day. It was assumed that the great majority of job-related trips would involve a single driver and that recreation/shopping trips would include an average of two persons in a vehicle.

The number of persons per vehicle for part-time residents and visitors was based on the survey. Based on that survey, it is estimated that the average number of persons per automobile for part-time residents and visitors of the Moana Project will be 2.77. The survey revealed that 25% of visitors at the existing Kiahuna Project came with one or more families and that 21.9% of these visitors shared a car with another family. Thus, while the 2.77 persons per vehicle might seem to be high, it is well-documented.

The number of trips generated by permanent residents, employees, and part-time residents/visitors was calculated using the following formula:

$$\begin{array}{l} \text{Average} \\ \text{Vehicle} \\ \text{Trips Per Day} \end{array} = \frac{\begin{array}{l} \text{(Permanent Population) or} \\ \text{(Number of Employees) or} \\ \text{(Average Part-Time Resident/Visitor Population) (Trips Per Day)} \end{array}}{\text{(Persons Per Vehicle)}}$$

Total average vehicle trips per day is the sum of the totals for full-time residents, employees, and part-time residents and visitors.

In order to estimate peak hour traffic, two calculations were made. The first was designed to determine peak hour traffic with average occupancy. The number of average vehicle trips per day as determined by the above formula was multiplied by 0.082. As shown in Table 13, that figure represents the percentage of total vehicle trips made during the peak hour. The second calculation was designed to determine peak hour traffic with maximum occupancy. Maximum vehicle trips per day were determined by the following formula:

$$\begin{array}{l} \text{Maximum} \\ \text{Vehicle} \\ \text{Trips Per Day} \end{array} = \frac{(\text{Maximum Part-Time Resident/Visitor Population}) (\text{Trips Per Day})}{(\text{Persons Per Vehicle})}$$

The maximum vehicle trips per day then were multiplied by 0.082.

#### Projected Traffic Increase as a Result of Proposed Moana Project

Table 15 summarizes the traffic volume that can be anticipated for full-time residents, employees, and part-time residents/visitors. Since the number of full-time residents and employees are constant regardless of amenities (even though a reduction in the number of amenities would result in a reduction in employment), Table 16 sets forth projected trips generated by part-time residents and visitors. In this table, the mitigating effect of the development with the proposed amenities becomes apparent. At average occupancy levels, in the 20th year of development, over 670 fewer trips per day will be generated with the addition of amenities. At maximum occupancy levels, over 1,400 trips will be eliminated. During the peak hour, approximately 55 trips less will be made due to the inclusion of amenities at average occupancy, and over 115 less at maximum occupancy.

To understand the impact of traffic generated by a new development upon an existing traffic corridor, a service volume and capacity analysis of the corridor must be completed.

TABLE 15

PROPOSED MOANA PROJECT'S VEHICLE TRIPS GENERATION FOR FULL-TIME RESIDENTS, EMPLOYEES, AND PART-TIME RESIDENTS/VISITORS<sup>1</sup>

Year	Travel Behavior Without Proposed Amenities			Travel Behavior With Proposed Amenities				
	Trips Per Day Average	Maximum	Peak Hour Trips Average	Maximum	Trips Per Day Average	Maximum	Peak Hour Trips Average	Maximum
1	447.6	529.9	36.7	43.5	406.7	443.8	33.3	36.4
2	587.8	750.3	48.2	61.5	507.4	581.0	41.6	47.6
3	699.4	945.4	57.4	77.5	577.7	689.2	47.4	56.5
4	871.8	1,204.6	71.5	98.8	707.2	858.1	58.0	70.4
5	1,057.0	1,479.9	86.7	121.4	847.8	1,039.5	69.5	85.2
6	1,265.8	1,778.8	103.8	145.9	958.1	1,244.6	78.6	102.1
7	1,410.1	2,013.4	115.6	165.1	1,111.6	1,384.9	91.2	113.6
8	1,598.3	2,291.6	131.1	188.0	1,255.4	1,569.7	102.9	128.7
9	1,794.7	2,406.2	147.2	197.3	1,407.1	1,762.4	115.4	144.5
10	1,984.8	2,859.0	162.8	234.4	1,552.4	1,948.6	127.3	159.8
11	2,176.9	3,141.5	178.5	257.6	1,699.8	2,137.0	139.4	175.2
12	2,366.4	3,421.3	194.0	280.5	1,844.7	2,323.0	151.3	190.5
13	2,555.8	3,699.8	209.6	303.9	1,988.6	2,507.6	163.1	205.6
14	2,743.3	3,978.3	225.0	326.2	2,132.5	2,692.4	174.9	220.8
15	2,934.9	4,260.0	240.7	349.3	2,279.5	2,880.2	186.9	236.2
16 <sup>2</sup>	2,853.5	4,191.8	234.0	343.7	2,191.6	2,798.3	179.7	229.5
17	2,906.4	4,254.5	238.3	348.9	2,239.7	2,850.9	183.7	233.8
18	2,941.7	4,296.4	241.2	352.3	2,271.7	2,885.9	186.3	236.6
19	2,965.8	4,325.1	243.2	354.6	2,293.5	2,909.7	188.1	238.6
20	2,965.8	4,325.1	243.2	354.6	2,293.5	2,909.7	188.1	238.6

<sup>1</sup>The travel behavior patterns reflected in this table are based on the survey results of present Kiahuna visitors. "Average" reflects anticipated levels of occupancy; "maximum" reflects 100% occupancy.

<sup>2</sup>The decrease in trips is attributable to the cessation of temporary employment as the 15-year buildout schedule is completed.

Source: McDonald & Smart, Inc.

TABLE 16

PROPOSED MOANA PROJECT'S VEHICLE TRIPS GENERATION  
FOR PART-TIME RESIDENTS/VISITORS<sup>1</sup>

Year	Travel Behavior Without Proposed Amenities			Travel Behavior With Proposed Amenities		
	Trips Per Day Average	Maximum	Peak Hour Trips Average	Trips Per Day Average	Maximum	Peak Hour Trips Average
1	74.5	156.8	6.1	33.6	70.7	2.8
2	147.0	309.5	12.1	66.6	140.2	5.5
3	222.6	468.6	18.3	100.9	212.4	8.3
4	301.1	633.9	24.7	136.5	287.4	11.2
5	382.6	805.5	31.4	173.4	365.1	14.2
6	464.1	977.1	38.1	210.4	442.9	17.3
7	545.8	1,149.1	44.8	247.3	520.6	20.3
8	627.3	1,320.6	51.4	284.4	598.7	23.3
9	709.1	1,492.8	58.1	321.5	676.8	26.4
10	790.9	1,665.1	64.9	358.5	754.7	29.4
11	872.7	1,837.3	71.6	395.6	832.8	32.4
12	954.4	2,009.3	78.3	432.7	911.0	35.5
13	1,035.9	2,180.8	84.9	469.6	988.6	38.5
14	1,117.4	2,352.4	91.6	506.6	1,066.5	41.5
15	1,198.9	2,524.0	98.3	543.5	1,144.2	44.6
16	1,210.8	2,549.1	99.3	548.9	1,155.6	45.0
17	1,219.7	2,567.8	100.0	553.0	1,164.2	45.3
18	1,225.7	2,580.4	100.5	555.7	1,169.9	45.6
19	1,229.8	2,589.1	100.8	557.5	1,173.7	45.7
20	1,229.8	2,589.1	100.8	557.5	1,173.7	45.7

<sup>1</sup>The travel behavior pattern reflected in this table is based on the survey results of present Kiahuna visitors. "Average" reflects anticipated levels of occupancy; "maximum" reflects 100% occupancy.

Source: McDonald & Smart, Inc.

Service volume is defined as the maximum number of vehicles that can pass over a given section of roadway during a specified time period while operating conditions are maintained at a specified level of service (classified by vehicle operating speed). Capacity is defined as the maximum number of vehicles which have a reasonable expectation of passing over a given section of roadway during the same specified time period.

Using a prescribed methodology from the Highway Capacity Manual<sup>1</sup>, the capacity of Poipu Road was calculated to be 1,842 vehicles/hour, and the service volume at 35 mph was calculated to be 1,069 vehicles per hour. Given the maximum number of vehicle trips per hour for the development without amenities, which was projected to be 354.6, the service volume at peak hours would not be exceeded. (There would be 992 vehicle trips per hour; service volume is 1,069.) Should the project be built with the amenities proposed, the total maximum number of vehicles during the peak hour becomes 876, well below the service volume for Poipu Road.

It also should be noted that the peak travel period on Poipu Road is between 4-6 p.m. It can be assumed that full-time residents and employees making job-related trips would be traveling during this period; however, during the 7 a.m.-9 a.m. period, the hourly volume percentage is 2.5%. In addition, due to the service-oriented nature of much of the proposed Moana Project's employment, it can be anticipated that employee trips would be more evenly distributed over the 24-hour period, resulting in less peak hour traffic generated than stated above.

Finally, it is important to note that, because of the incremental nature of the development, the build-up of traffic occurs relatively slowly over a 20-year time frame. Tables 15 and 16 show the annual estimated increase.

One of the prime considerations for the study area is that Hapa Road be closed off to automobile traffic and be converted to a community pedestrian and bicycle way. Currently, it is bordered by old stone walls on both sides and is about 20 feet wide from wall to wall. Hapa Road is a County road and, as such, would remain in the public domain regardless of any type of improvements. Presently, it is unpaved and very rocky. Its primary function is to provide access to grazing land existing on the project site and to a garbage dump which is located to the north of the Catholic Church property.

In its present location, Hapa Road will serve as a central pedestrian and bicycle collector for residents destined for the shopping area, the tennis club, the beach park, and the resort hotels.

## V. ADVERSE ENVIRONMENTAL IMPACTS

This section deals with a description of probable physical adverse effects which cannot be avoided. These include airborne emissions, noise generation, and water pollution considerations and evaluates the probably degrees of impact.

### AIRBORNE EMISSIONS<sup>1</sup>

The impact of the Moana Project upon the existing air quality has two components. The first component is the generation of air pollutants by motor vehicles, specifically cars and trucks, and is quantifiable. The second component deals with the generation of dust and smoke, and is difficult to quantify. During the construction phase of the Moana Project, truck traffic and dust will be the prime sources of air pollution, although measures will be applied to keep dust to a minimum. Gradually, as people begin to inhabit the development and as employment increases, car traffic will play an increasing role with respect to emissions. As the construction phase of the development ends, truck traffic will be limited to service/supply vehicles, and cars will be the major contributor to air pollution.

#### Automotive Emissions

The two principal contributors to automotive emissions are cars and trucks. Truck traffic is generated by construction demands and service delivery requirements. Automobile traffic is divided into three categories: traffic generated by (1) full-time residents, (2) part-time residents and visitors, and (3) employees, both temporary and permanent. The effect of each of these

---

<sup>1</sup>The generation of airborne emission data was based upon a traffic projection calculated before the projection done by McDonald & Smart, Inc. The earlier traffic figures are, however, more conservative and therefore the emission quantities stated here may be viewed as maximum values.

components has been analyzed in relationship to the Moana Project's build-out schedule, the projected population growth, and project employment for the development periods of 1, 2, 5, 10, 15, and 20 years.

Truck Trip Generation: Requirements for materials during construction were estimated (see Table 17), then divided over the 15-year construction period with the demand for materials assigned according to the projected built-out schedule. Basic materials necessary for the project are principally topsoil from Koloa needed for the golf course and residential acres and vicinity; concrete and asphalt cement from Half Bridge and Lihue needed for roads, bicycle ways, and sidewalks; and base course material from nearby quarries needed for roads. It was determined that for building materials, one trip per working day per building specialty was needed. There are ten categories: plumbing, electrical, glass, flooring, roofing, acoustical, telephone, printing, interior/furniture, and landscaping. In addition, trips to Lihue for miscellaneous construction supplies and service deliveries were also estimated into the daily truck traffic.

An analysis of material movement and daily mileage generated by this construction activity is presented in Table 18.

Automobile Trip Generation: By far the greatest impact on the ambient air quality from the Moana Project will be generated by use of automobiles. Automobile trip generation is divided into three categories: trips by permanent residents, trips by part-time residents and visitors, and trips by temporary and permanent employees. The number of trips per category was obtained from the projected population growth (see Table 19) and

TABLE 17  
MOANA PROJECT MATERIAL REQUIREMENTS  
(Cubic Yards)

	<u>Topsoil</u>	<u>Concrete</u>	<u>Asphalt Cement</u>	<u>Base Course</u>
Year 1	67,900	400	2,500	6,900
Year 2	64,400	-	-	-
Year 5	6,500	400	2,500	6,900
Year 10	5,900	400	2,500	6,900
Year 15	5,900	400	2,500	6,900
Total 15-Year Development	192,000	1,600	10,000	27,600

TABLE 18

GENERATED TRUCK TRIP INFORMATION

	<u>Topsoil</u>	<u>Concrete</u>	<u>Asphalt Cement</u>	<u>Base Course</u>	<u>Building Materials</u>	<u>Supply Trips</u>	<u>Service Deliveries</u>	<u>Total Miles/Day</u>
Cubic Yards Per Load	40.0	7.5	7.5	28.0	-	-	-	-
Miles Per Round Trip	4	12	12	12	18	24	24	-
<u>Round Trips Per Day</u>								
Year 1	7	0.20	1.3	1	10	2	5	-
Year 2	7	-	-	-	10	1	6	-
Year 5	1	0.20	1.3	1	10	1	10	-
Year 10	1	0.20	1.3	1	10	1	12	-
Year 15	1	0.20	1.3	1	10	1	15	-
Year 20	-	-	-	-	-	-	15	-
<u>Miles Per Day</u>								
Year 1	28	2	16	12	180	48	120	406
Year 2	28	-	-	-	180	24	144	376
Year 5	4	2	16	12	180	24	240	478
Year 10	4	2	16	12	180	24	288	526
Year 15	4	2	16	12	180	24	360	598
Year 20	-	-	-	-	-	-	360	360

Source: Belt, Collins & Associates, Ltd.



projected employment (see Table 20). For the number of automobile trips generated in each category, the following formula was used:

$$\text{Automobile trips per day} = \frac{(\text{Population}) \times (\text{Trips Per Day})}{(\text{Persons Per Automobile})}$$

For the generation of total trips, the below values were used per category:

	<u>Trips/Day</u>	<u>Persons/Automobile</u>
Permanent Residents	4	1.75
Part-Time Residents and Visitors	2	1.75
Employees	2	1.25

After the number of trips were generated, it was felt that 12 miles was a good average for one trip since permanent residents would probably travel less distances and the part-time residents and visitors greater distances. An analysis of automobile trip generation and mileages is given in Table 21.

Generation of Automotive Emissions: To calculate the amount of pollutants, it was decided that the 1975 Federal Emission Standards for trucks and cars would be used. Although these standards will probably soon be out of date, it was felt that these would provide a good conservative estimation of future emissions from automobiles that may or may not adhere strictly to future standards. The 1975 standards in grams per mile are given as follows:<sup>1</sup>

<u>Pollutants/Vehicle</u>	<u>Automobile</u>	<u>Diesel Truck</u>
CO	15	40
HC	1.5	16
NOx	3.1	16
Particulates	0.1	0.5

<sup>1</sup>Shishedo, Department of Health, State of Hawaii.

TABLE 20

PROJECTED EMPLOYMENT AS A RESULT OF THE MOANA PROJECT

	Year <sup>1</sup>														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<u>Temporary Employment</u>															
Construction Employment															
Management	2	3	3	3	3	3	2	2	2	2	2	2	2	2	2
Foreman/Supervisor	10	12	12	10	8	8	8	8	8	8	8	8	8	8	8
Building Trader	75	75	65	65	65	65	55	55	55	55	55	55	55	55	55
Unskilled	50	50	35	35	35	35	30	30	30	30	30	30	30	30	30
Total Temporary Annual Employment	137	140	115	113	111	111	95	95	95	95	95	95	95	95	95
<u>Permanent Employment</u>															
Sales															
Management/Sales	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Clerical/Secretarial	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Single-Family Units															
Building and Grounds	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
Maintenance	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Maid Service															
Multi-Family Units/Rental															
Management	2	2	2	2	2	2	3	3	3	3	3	4	4	4	6
Clerical/Secretarial	8	11	14	17	20	23	26	29	32	35	38	41	44	47	50
Building and Grounds															
Maintenance	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Maid Service	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
Golf Course/Clubhouse															
Management	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3
Clerical/Secretarial	2	2	2	3	3	3	3	3	4	4	4	4	4	4	4
Building Maintenance	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Food Service	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Tennis Pro	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
Other Maintenance	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Total Permanent Annual Employment	87	108	128	152	173	194	216	236	261	282	303	325	346	367	390

<sup>1</sup>Year 1 represents fiscal year 1977-78.

Source: McDonald & Smart, Inc.

TABLE 21

## AUTOMOBILE TRIP AND MILEAGE GENERATION

	Trips Per Day					
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 5</u>	<u>Year 10</u>	<u>Year 15</u>	<u>Year 20</u>
Permanent Residents	25	75	377	1,013	1,646	1,906
Part-Time Residents and Visitors	151	291	713	1,416	2,119	2,119
Employees	<u>358</u>	<u>397</u>	<u>454</u>	<u>603</u>	<u>776</u>	<u>776</u>
TOTAL	534	763	1,544	3,032	4,541	4,801

	Miles Per Day					
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 5</u>	<u>Year 10</u>	<u>Year 15</u>	<u>Year 20</u>
Permanent Residents	300	900	4,524	12,156	19,752	22,872
Part-Time Residents and visitors	1,812	3,492	8,556	16,992	25,428	25,428
Employees	<u>4,301</u>	<u>4,764</u>	<u>5,448</u>	<u>7,360</u>	<u>9,912</u>	<u>9,312</u>
TOTAL	6,413	9,156	18,528	36,508	54,492	57,612

The standards are applied to generated mileages, then divided by 453.6 for a conversion from total grams to pounds. The results are given in Table 22.

Some of the conclusions that can be drawn from these calculations are:

1. A system of public buses that could transport the employees to and from work would substantially decrease the level of automotive emissions.
2. The inhabitants of the Moana Project could also be served by the proposed public bus system, which would also substantially decrease automotive emissions.
3. The effective application of Federal and State vehicle emission standards will mean that, even though the total vehicle miles will increase greatly in the future, the per capita vehicle emissions will greatly decrease.

The above analysis does not answer the more cogent questions regarding the quality of the air: What will be the concentrations of the particular pollutants at various points? How do these concentrations compare with the State's Ambient Air Quality Standards? What will be the effect on plant and animal life?

Projecting how pollutants will be dispersed is more difficult and not necessarily accurate. Vehicles travel at different times of the day to different points on the island. Meteorological conditions vary from place to place and from day to day. Some of the pollutants are oxidized in air in a short time -- CO to CO<sub>2</sub> for example -- resulting in relatively

TABLE 22  
VEHICLE EMISSIONS, MOANA PROJECT

	Pollutant/ Year	Year					
		1	2	5	10	15	20
Cars (lbs/day)	CO	212	303	612	1,207	1,801	1,905
	HC	21	30	61	120	180	191
	NO <sub>x</sub>	44	62	126	249	372	394
	Particulates	1.4	2.0	4.0	8.0	12.0	12
Trucks (lbs/day)	CO	36	33	42	46	53	32
	HC	14	13	17	19	21	12.7
	NO <sub>x</sub>	14	13	17	19	21	12.7
	Particulates	0.4	0.4	0.5	0.6	0.7	0.4
Total (lbs/day)	CO	248	336	654	1,253	1,854	1,937
	HC	35	43	78	139	201	203.7
	NO <sub>x</sub>	58	75	143	268	393	406.7
	Particulates	1.8	24	45	8.6	127	12.4

Source: Belt, Collins & Associates

innocuous chemical forms. Others will react in sunlight to an unknown degree to produce photo-chemical smog. These and other factors must be accounted for in a dispersion-modeling technique in order to project the concentration of pollutants in ambient air. Because many of these factors are not known and because dispersion models are in only the research stage, a quantitative accounting could only provide limited information. In light of this, it seems more appropriate to try to assess the impact of the pollutants in a qualitative manner.

It is felt that the emissions from motor vehicles will have a minimal effect on the ambient air quality for three reasons: First, in the Poipu area the land slopes toward the sea and there is usually a constant northeasterly wind, which will blow most of the airborne pollutants out to sea. Secondly, the traffic for the Moana Project is expected to be seasonal (heaviest during the summer months) and, therefore, emissions will not be concentrated year-round. Lastly, the only air quality monitoring station is located in downtown Lihue, which is subject to greater traffic than the Moana Project will generate; however, the air quality in Lihue is still rated as excellent (see Section II - Air Quality). Chapter 42 of the Public Health Regulations established the maximum permissible concentrations of identified pollutants in the ambient air.

#### Dust and Smoke

During the first two years of construction, dust generation could potentially become a nuisance. In this time period, the initial grading and filling on-site will begin, and all of the proposed recreational facilities will be built. This includes the golf course, the tennis complex, the park dedication, open space, all access ways, the commercial center, and all of the required infrastructure. Dust generated in this phase of

construction could have an impact upon existing developments nearby unless stringent dust control measures are undertaken. This means that water or oil must be applied regularly to avoid airborne dust as there is a constant northeasterly breeze.

Other than construction, road dust may be kept down also with water, and there must be a ban on open burning. Minor smoke will be generated from home cooking facilities; however, this will be dissipated rapidly.

#### NOISE GENERATION

The impact of noise by the Moana Project is examined in two parts. The construction phase will deal with noise generated by heavy earth-moving and construction equipment. The completed development phase will deal with the impact of traffic noise produced by residents' automobiles during daily usage.

##### Construction Phase

During the initial phase of construction, the major work needed to be done is the filling and grading of the site in preparation for the golf course, clubhouse, open space, bicycle and pedestrian ways, and the various infrastructure requirements. The site will be developed from its southern boundary, gradually building northward. The greatest sources of noise will come from tractors and other earth moving equipment. From Figure 8, it is assumed that the average sound pressure level for the construction phase will be 85 dBA at a distance of 50 feet. This may affect the surrounding developments.

The nearest development to the proposed Moana Project is the Plantation Gardens which is located approximately 600 feet away, across Poipu Road. Construction noise generally diminishes by 6 dBA with each doubling of the distance on a direct transmission path. At 600 feet, the noise level would be in the range of

FIGURE 8  
CONSTRUCTION EQUIPMENT NOISE RANGES

		Noise Level (dBA) at 50 Feet					
		60	70	80	90	100	110
Equipment Powered by Internal Combustion Engines	Earth Moving	Compacters (Rollers)		H			
		Front Loaders		-----			
		Backhoes		-----			
		Tractors		-----			
		Scrapers, Graders			-----		
		Pavers				H	
		Trucks			-----		
Equipment Powered by Internal Combustion Engines	Material Handling	Concrete Mixers		-----			
		Concrete Pumps			H		
		Cranes (Movable)		-----			
		Cranes (Derrick)				H	
Equipment Powered by Internal Combustion Engines	Stationary	Pumps		H			
		Generators		-----			
		Compressors		-----			
Impact Equipment		Pneumatic Wrenches			-----		
		Jack Hammers and Rock Drills			-----		
		Pile Drivers (Peaks)			-----		
Other		Vibrator		-----			
		Saws		-----			

Note: Based on limited available data samples.

64 dBA. This sound level is classified as intrusive by Figure 9. However, this figure is somewhat misleading. First, the distance of 600 feet is the closest Moana Project is to another development. Second, as the Moana Project progresses, the earth moving equipment will move farther away from Poipu Road; therefore, the 64 dBA value approximates a maximum noise level. Should the noise become very annoying due to wind conditions, this may be alleviated by the use of noise barriers, but it is doubtful that this situation will arise.

Project Completion

Upon completion of the project, the major contributor to noise generated by the Moana Project will be the cumulative automobile traffic. From the previous section, a maximum volume of 1,200 cars per hour is derived. Using a nomographic method set forth in the Manual for Highway Noise Prediction (short version) by the Department of Transportation, dBA values for various distances from the roadway (Poipu Road) are obtained, using Figure 10. The results are shown below in Table 23.

TABLE 23

TRAFFIC NOISE LEVELS AT PROJECT COMPLETION, POIPU ROAD

Maximum Vehicle Flow	1,200 vehicles per hour
Average Traffic Speed	35 mph
Percent Trucks and Buses	14%
<u>Effective Distances (ft.)</u>	<u>Sound at Observer Distance (dBA, L10)<sup>1</sup></u>
50	84
100	79
500	74
1,000	70

<sup>1</sup>L10 is the 10-percentile level; the sound level that is exceeded only 10 percent of the time, the level indicating the noisest events at a point.

FIGURE 9

### Weighted Sound Levels and Human Response

Sound Source	dB (A)*	Response Criteria
	150	
Carrier Deck Jet Operation	140	Painfully Loud
	130	Limit Amplified Speech
Jet Takeoff (200 feet) Discotheque Auto Horn (3 feet)	120	Maximum Vocal Effort
Riveting Machine	110	
Jet Takeoff (2000 feet)	100	
Shout (0.5 feet)	100	
N.Y. Subway Station	90	Very Annoying
Heavy Truck (50 feet)	90	Hearing Damage (8 hours)
Pneumatic Drill (50 feet)	80	Annoying
Freight Train (50 feet)	70	Telephone Use Difficult
Freeway Traffic (50 feet)	70	Intrusive
Air Conditioning Unit (20 feet)	60	
Light Auto Traffic (50 feet)	50	Quiet
Living room	40	
Bedroom	40	
Library	30	Very Quiet
Soft Whisper (15 feet)	30	
Broadcasting Studio	20	
	10	Just Audible
	0	Threshold of Hearing

\*Typical A—Weighted sound levels taken with a sound-level meter and expressed as decibels on the scale. The "A" scale approximates the frequency response of the human ear.  
Source: Department of Transportation.

Source: Environmental Quality - The First Annual Report of the Council on Environmental Quality, August 1970.

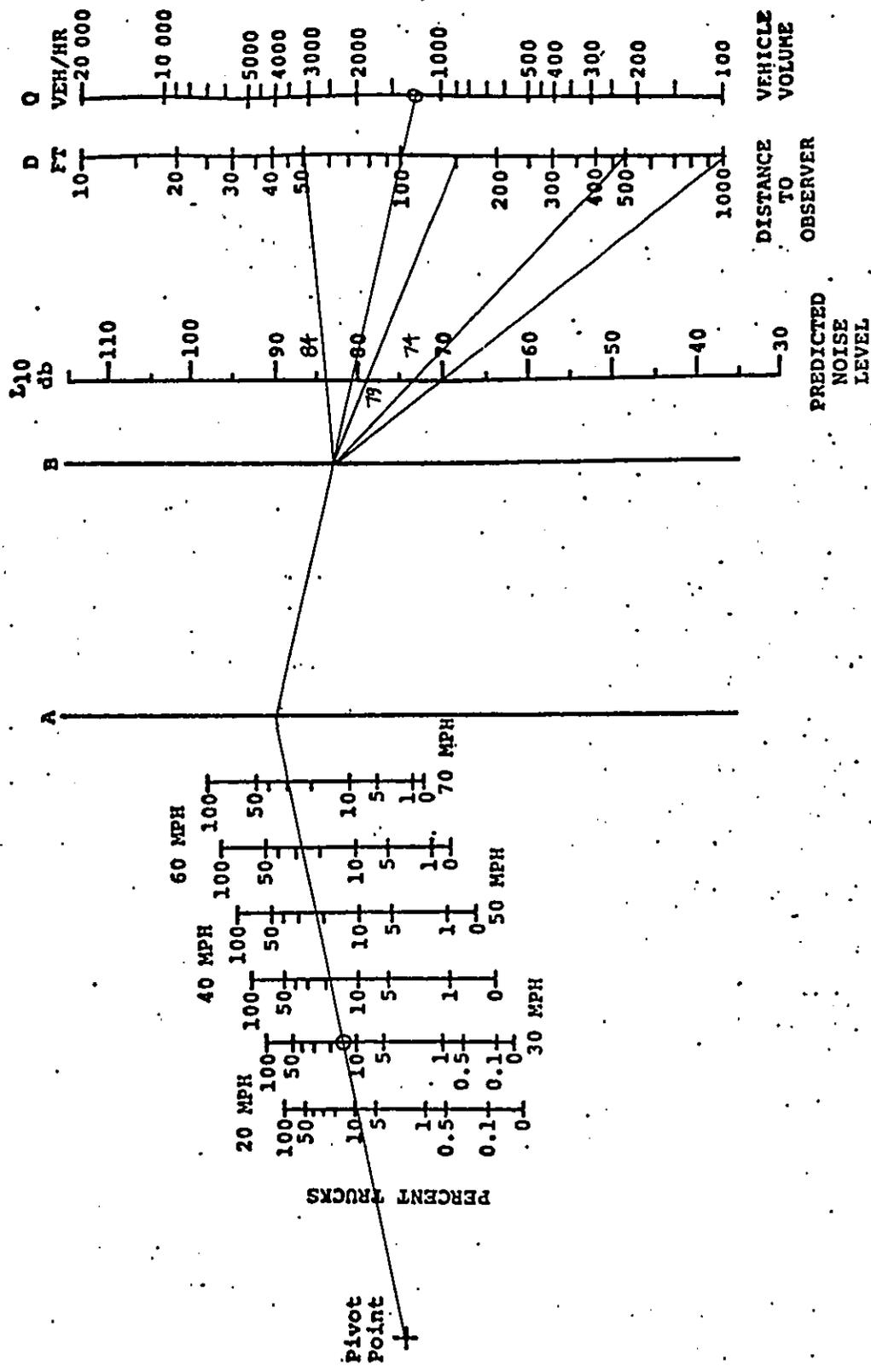


Figure 10. Nomograph for Approximate Prediction of Highway Noise Levels (Conventional Trucks).

Projected peak volumes of traffic will occur between 4 p.m. and 6 p.m. Therefore, these noise levels are within the State Noise Regulations.<sup>1</sup>

<u>Time Periods</u>	<u>Level of Noise Not to be Exceeded</u>
6 a.m.- 6 p.m.	86 dBA
6 p.m.-10 p.m.	84 dBA
10 p.m.- 6 a.m.	73 dBA

It is doubtful that noise will be a serious problem to either the Moana Project or to the surrounding developments because most of the developments are at least 300 feet from the road. Construction noise should be monitored carefully so as to avoid nuisance level noise situations.

#### WATER POLLUTION

##### Irrigation and Fertilization

It is felt that the irrigation and fertilization practices at the Moana Project will have minimum effect, as the imported topsoil and turfgrass will have better water and nutrient retention capabilities than the adjacent sugarcane lands. In addition, the area is much less than the adjacent land and there are no domestic water sources on-site. A more extensive discussion is included in the Water Resources segment of the previous section.

##### Flooding and Runoff

Because there is a potential for sheet runoff on the Moana Project site, in the infrastructure plan, two drainage ditches have been proposed. This would prevent major sheet runoff from

---

<sup>1</sup>Reference 19, p. B-6.

occurring. No structures will be constructed within the limits of the 100-year storm of Waikomo Stream. Also, the enlargement of the existing culverts under Poipu Road have been recommended.

Sewage and Solid Waste Generation

All of the domestic sewage will be treated at the existing sewage treatment plant. The effluent will be used to irrigate the proposed golf course. Solid waste will be conveyed to the open dump near the Catholic Church; however, alternatives to the open dump are definitely needed for health as well as aesthetic reasons. Refer to the Infrastructure segment.

## VI. ALTERNATIVES

This section describes three alternatives to the proposed project, and summarizes the perceived impacts of these alternatives.

### ALTERNATIVE ONE: NO AMENDMENT TO GENERAL PLAN

#### Description

This is the "no project" alternative. The alternative assumes no changes in the General Plan to permit any uses other than the present one. Hence, the land would remain zoned for agriculture and other potential job and income-generating uses would be precluded.

#### Physical and Environmental Impacts

There would be no transformation in the general character of the land and its visual qualities remain the same. As described elsewhere in this report, the site is covered predominantly by haole koa and "other minimum value scrub brushes and weeds." The present foliage is largely dull red-brown-greyish in appearance. Whether the aesthetic potential of the area is maximized by preservation of the present growth of principally natural weeds, on the one hand, or by irrigation and landscaping of the area to create a lush green appearance is, of course, a matter of personal taste. It is clear that construction of the golf course, adjacent landscaping, and landscaping associated with development of housing units would substantially alter the visual character of the land. However, we think it unlikely that the great majority of the residents of Kauai would consider the present foliage on the site as an aesthetic asset, the preservation of which should -- in and of itself -- be

considered an environmental goal. Indeed, the present growth is the product of arid, rocky land which is out of character with the general visual impact of Kauai, which is characterized by either green, verdant natural growth, cultivated crops, or attractively landscaped recreational areas. The present growth on the site is inconsistent with -- and counterproductive to -- the visual images both in and around the town of Koloa and the character of the resort developments immediately across Poipu Road on Poipu Beach. In summary, the impact of the "no project" alternative will be to maintain a large area of scrub growth with little inherent aesthetic value.

The no project alternative would have the positive impact of not disturbing existing animal life on the site. However, as is noted elsewhere in this report, there are no endangered species of animals on the site which would be adversely affected.

At the termination of construction of the proposed project and completion of landscaping, it is anticipated that much of the animal life which migrated during construction will return to the site. Since well over half of the site will remain in open space and landscaping, extensive congenial habitat will exist for small field animals and birds. Indeed, it is likely that the extensive new landscaping will attract greater quantities of birds due to the planting of flower and berry bearing trees and shrubs. Hence, while it is theoretically arguable that the no project alternative has a positive impact in that it causes no disruption of existing animal life, it is clear that such a positive impact is very slight in relation to the total animal population, and its living habits in the area.

Continuation of the status quo under the no project alternative obviously would not involve the disturbance of any archeological sites. However, this positive impact of doing nothing on the site is minimal. Because of the overgrown character of the land, any such sites are largely inaccessible to the general public. The proposed development is committed to preserving major sites and, in fact, would open them up to greater public accessibility.

The major positive impacts of the no project alternative are (a) the lack of additional traffic generation, (b) the lack of generation of additional automotive emissions, and (c) the lack of additional noise generation which, upon completion of the proposed development, would result largely from increased automobile usage. It is clear that, if nothing is done on the site, there will be substantially less traffic in the Koloa-Poipu area than if the proposed project is developed. However, as is documented elsewhere in this report, even at projected peak hour traffic levels, the additional traffic would be well within the designed capacity of Poipu Road. This results from the nature of the proposed development which tends to minimize off-site travel as compared to other types of developments. Hence, while there will be substantially less traffic under the no development alternative, this is not a case where a decision not to build is dictated by the need to avoid traffic congestion which otherwise would occur. As shown by the traffic analysis, it is not anticipated that the proposed development would create a congested situation.

Similarly, there will be substantially less automobile emissions under the no project alternative than there will be if the project is built. However, as indicated in this report's Section V, which analyzes adverse environmental impacts, it is not anticipated that the project's additional vehicles will have a significant effect on ambient air quality.

Finally, doing nothing on the property will not create any additional noise. Again, however, the additional noise created by the proposed project will occur largely in the construction stage and -- based on the experience at Kiahuna -- it is not anticipated that construction noise will have a seriously intrusive effect on surrounding developments. Moreover, as we have emphasized elsewhere, construction noise will be monitored carefully to avoid nuisance level situations. Since most of the surrounding developments are at least 300 feet from the road, it is doubtful that the automobile noise created by the proposed project will have an intrusive effect. Moreover, the noise generated by the projected peak traffic volume is within the state noise regulations.

In summary, the no project alternative will, by definition, do nothing to transform the character of the site or to cause any adverse impacts (unless one considers the mere preservation of generally unsightly ground cover to be an adverse impact). The value of preserving the environmental status quo (and hence creating no new impacts) diminishes to the degree that the proposed development alternative's impacts are relatively minor in the context of the benefits created. The Moana Project's impacts are either distinctly positive or, where they are adverse, are relatively minor, are within standards of acceptability, and/or are realistically subject to mitigation. In such a situation, the environmental impacts of doing nothing are seen to be neutral at best. (Unless, of course, one takes the position that preservation of a particular site in its existing state is meritorious simply for its own sake, regardless of the site's lack of aesthetic, recreational, or commercial value in its present condition.) The exception to that analysis is in the area of population and traffic. One may argue that the no development alternative is sound because one holds the value of no more

people and no more cars to be paramount. If those in fact are the decision-makers' prime values, then the no project alternative clearly has positive impacts. However, such considerations must be balanced against the economic impacts of the no project alternative.

#### Economic Impacts

If there is no General Plan amendment, the site will remain theoretically in agriculture. We say "theoretically" because, although the land is designated agricultural, it clearly is uneconomic to use it for that purpose. Without irrigation, there is inadequate water throughout the site for productive agriculture, and less than 20% to 25% of the entire site has adequate soil depths to cultivate any crops. Given the limited potential return, the costs of converting the site into viable agricultural land are prohibitive. (See Section VII of this report and the report of Jack Larson, agricultural consultant.)

Since the alternative uses for the site, if the General Plan is not amended, are limited to either status quo (in effect, no use) or agriculture (which cannot be profitable), the no project alternative would have the following adverse economic and social effects:

1. Substantial additional net revenues will not be realized by the County from the property. The estimated net revenue to the County from the property over the planned development period if the project is not built is \$453,000. The net cumulative revenues to the County over the projected development period if the project is built are estimated at \$12,447,000. Hence, the incremental County net revenues associated with the project approximately

are \$12,000,000 by the end of the development period. Thereafter, it is estimated that revenues to the County if the project is built will be \$1,170,851 annually. That figure represents the annual opportunity costs to the County if the project is not built.

2. Under the no project alternative, no significant additional primary or secondary employment and income will be generated from use of the land. An impact of no General Plan amendment will be to eliminate 105 construction jobs annually -- 93 of which are estimated to be filled by local Kauai residents -- throughout the 15-year period of condominium construction.

The impact on income will be to eliminate annual construction salaries of \$1,313,250. The impact of the no project alternative on permanent employment will be to eliminate at least 390 permanent jobs which otherwise would be created, of which 383 are estimated to be filled by local Kauai residents. Permanent employment annual wages eliminated by the no project alternative are estimated at \$3,637,600.

3. As noted previously, a project such as the Moana Project generates substantial secondary employment and economic activity in the economy beyond that which results from direct employment in the project itself. It is estimated that the no project alternative will eliminate approximately \$4,062,000 in secondary economic activity which otherwise would occur throughout the Kauai economy as a result of approximately \$1,300,000 of annual construction wages associated with the project during the development period. Even more significantly, the secondary economic activity

created throughout the Kauai economy as a result of the annual project permanent employee wage would be eliminated by the no project alternative. That secondary economic activity ranges from approximately \$2,581,000 in year one to \$11,251,000 in year fifteen and thereafter.

In summary, the total gross annual economic activity estimated to result from the proposed project ranges from approximately \$8,695,000 in year one to approximately \$20,263,000 in year fifteen. Thereafter, with the termination of construction, the total estimated economic activity levels out at approximately \$14,889,000 annually. The opportunity cost to the County of not amending the General Plan is measured by the jobs, personal incomes, and additional tax revenues to the County which are represented by those figures, and which will not be generated if the project is not built.

4. Given the fact that the Kauai tax base has not been expanding as fast as the rise in the cost of public services, a clear economic impact of the no project alternative is to forego the opportunity to substantially mitigate this increasing cost/revenue imbalance. Should the proposed project not be built (or other projects with equivalent economic and tax-generation capacities), an economic impact of a no General Plan amendment (or other County actions to generate an equivalent tax base expansion) will be the eventual necessity to either raise taxes for Kauai residents or reduce public services.
5. A major social and economic impact of a no General Plan amendment will be to eliminate from the Kauai housing market a substantial number of units available for housing permanent Kauai residents at price levels within the ability of substantial numbers of moderate income people to pay.

Kauai has had a substantial housing shortage. The demand for quality housing at reasonable prices is going to continue whether or not the proposed project is built. An impact of no General Plan amendment will be to sharply reduce the opportunity which otherwise would exist for the people of Kauai to own homes in a high quality, planned community with design controls and environmental preservation standards.

Since the demand for housing will remain high, while supply is constricted from the level which otherwise would exist if the General Plan were amended, an impact of no General Plan amendment will be to encourage continued random and unplanned lot and block development without adequate design controls, resulting in proliferation of housing sites, urban sprawl, and the construction of marginally acceptable housing.

#### ALTERNATIVE TWO: PARTIAL AMENDMENT TO GENERAL PLAN

##### Description

Alternative Two refers to any hypothetical alternative which would result in a General Plan amendment which would permit the proposed project to be built at an assumed reduction in magnitude. Such a hypothetical alternative could be the result either of reduced densities or a reduced project land area or a combination of both. It is difficult to assess the impacts of a partial General Plan amendment because there is almost an infinite range of possibilities as to the form that such a partial amendment could take. It is important to recognize that there is a point at which a reduction in the planned number of units becomes economically infeasible to the developer. At that point, a partial General Plan amendment, in practical effect, is equivalent to the no project alternative. This is because many of

the developer's costs will remain largely fixed whether he is allowed the number of units in the proposed project or whether the number of such units is sharply reduced. If a partial General Plan so substantially reduces the number of units available for sale, while fixed costs remain high, the project cannot be built. Sufficient units must be available for sale to permit the allocation of such fixed costs as utility and road infrastructure development, site clearing, landscaping, and golf course development to be allocated to the units without making the prices of the units so high as to be prohibitive. In other words, there must be sufficient units for sale to enable all purchasers to share the fixed costs at a reasonable price.

With that analysis, it is possible to assess in general terms some of the resulting impacts which would occur under a partial General Plan amendment. However, it is necessary to assume the substance of a partial General Plan amendment, whereas the reality of the amendment might, in fact, turn out to be very different. For the purposes of this analysis, we are assuming that a partial General Plan amendment would occur which reduces the proposed project's total number of units to 75% of the planned number. Such a partial amendment could occur either through reduction of planned densities, or an amendment which would apply to a smaller land area, or a combination of the two. Under such an amendment, the project would consist of 1,087 dwelling units instead of the proposed 1,450. The project still would include major recreational facilities such as the golf course, tennis courts, swimming pools, and bicycle paths.

#### Physical and Environmental Impacts

With the exceptions of total population and automobile traffic, there are no substantial physical and environmental impacts

which would change significantly under the assumed partial General Plan amendment from the impacts which would exist as a result of the proposed Moana Project. The transformation of the visual character of the land that would occur under the Moana Project would still occur. Landscaping along Poipu Road and throughout the development, as well as construction of the golf course, still would occur. The generally brown and arid appearance of the site would be converted to a lush, green appearance under the partial amendment to the General Plan.

Total project population and total estimated traffic generation would be reduced by 25% under the assumed partial General Plan amendment. Twenty-five percent less domestic water would be consumed. However, requirements for irrigation water and for water for fire protection would not change significantly.

#### Economic Impacts

1. Under the assumed partial General Plan amendment, both the net cumulative revenues to the County and the annual net revenues to the County after the project is completed would be reduced at least 25%. The actual reduction may be slightly higher than that, since certain of the costs associated with extending public services to the project will not decline in proportion to the reduction of population from the planned project level to the 75% level that would occur under the partial General Plan amendment. However, tax revenues would decline in proportion to the reduced population. Hence, there likely would be a slightly greater reduction in tax revenues than in public costs, resulting in net public revenues being reduced by an amount slightly over 25%.

2. Under the partial General Plan amendment, we estimate that non-management jobs will be reduced by about 25% (management jobs will be unaffected). This means that annual construction jobs are estimated to be reduced from 105 to 78, and that annual construction wages are estimated to be reduced from \$1,313,250 to \$984,900. It is estimated that the assumed partial General Plan amendment would result in a reduction of 390 estimated permanent jobs to 292 estimated permanent jobs, and that the projected annual permanent employment salary of approximately \$3,638,000 would be reduced to \$2,728,000. Similar percentage reductions would be expected to occur in the secondary jobs and economic activity which we have estimated would be created by the Moana Project.
3. The assumed partial amended General Plan would result in 25% fewer housing units priced for the moderate income housing market for purchase by local people.

As noted in the beginning of this subsection dealing with the partial General Plan amendment alternative, a large number of varying assumptions can be made as to the scope of such a partial General Plan amendment. The general estimated economic consequences of any such alternative can be derived simply by applying the assumed percentage reduction of numbers of units available to the base economic estimates that we have made in relation to the Moana Project as proposed. In evaluating the merits of any partial General Plan amendment, the decision-maker will want to consider two constraints. The first is whether a reduced project remains economically viable from the standpoint of the developer. If not, a partial General Plan amendment is tantamount to no General Plan amendment because the project likely will not be built. If, however, the developer decides to proceed in such a situation, the risk of an unsuccessful project grows substantially due to the point

mentioned earlier -- i.e., the unavailability of an adequate number of units for sale to bear the costs of recreational and service infrastructure without pricing the units out of the market. Project failure is worse than no project at all, since it results in empty units, poor maintenance, and gradual project deterioration to the point where it can be a blight on the landscape. Hence, a first consideration in evaluating alternatives is to determine a scale which is both economic for the developer and consistent with County objectives.

The second constraint which the decision-maker will want to consider in evaluating alternatives is the balancing of economic and social considerations, on the one hand, with environmental considerations on the other. In considering a partial General Plan amendment, the County will want to consider whether a reduced project produces net environmental gains sufficient to warrant substantial reduction in economic benefits to the residents of Kauai and to the County's cost/revenue relationship. One judgment is that a reduction in project scope -- while maintaining a sufficient scale to preserve a viable project -- would not produce sufficient environmental benefits to justify the corollary loss of economic benefits to the County.

#### ALTERNATIVE THREE: INCREMENTAL AMENDMENT TO THE GENERAL PLAN

##### Description

Under this approach, the General Plan would be amended in increments. The County would have the presumed advantage of assessing the success and quality of each project within the total site before granting subsequent General Plan amendments to develop additional projects within the site.

### Infeasibility of Incremental General Plan Amendments

From the developer's point of view, incremental General Plan amendments for a project of the contemplated magnitude are economically infeasible. From the County's point of view, such incrementalism would be contrary to the sound planning and development of the area.

The success of the proposed project is dependent upon the development of extensive, high quality, very expensive amenities. Both the marketability of the units, and protection of the interests of potential buyers, require that the major portion of those recreational facilities -- as well as the utilities infrastructure -- be built at the front-end of the project. The economic viability of the project depends on the developer's knowledge, at the time when he constructs those facilities, that he has the necessary governmental approvals to build and sell a number of residential units sufficient to bear a reasonable allocation of recreational and infrastructure costs to the units. Incremental General Plan amendments would not provide the necessary assurances to permit the developer to proceed with the high quality development which is planned.

Should the developer in fact proceed in the absence of such assurances, make a heavy front-end capital investment, and subsequently not receive the incremental General Plan amendments required, the developer then has no alternative but to substantially raise the prices for all units. A probable consequence of such a course of action would be to price all of the units out of the market; a certain consequence would be to eliminate the possibility of providing moderate income housing.

In addition to the County's interest in ensuring not only a high quality development, but also a reasonably priced one, the County has a strong interest in preserving a master plan for the entire site and in ensuring that all development which occurs on the site takes place in a functionally and aesthetically integrated fashion. Should the incremental General Plan amendment process be followed, and should as a result thereof the developer experience periods of economic stress, the developer might very well find it necessary to sell off various pieces of the site to a substantial number of smaller developers. Such additional developers would produce their own plans and seek their own General Plan amendments. The result could be a balkanization of planning for the area, a great variety in the quality of subsequently proposed developments, lack of architectural integrity, and the piecemeal development of a site whose configuration and location requires integrated master planning and development if aesthetic and environmental quality is to be maintained.

The County's legitimate interest in ensuring that the total property be developed in a high quality fashion is protected by its ability to grant or withhold building permits as applications for various phases are submitted. In this fashion, the County can guarantee that the developer's representations as to what will occur on the site are in fact honored. The County also can ensure that development occurs in the context of market realities.

Incremental General Plan amendments in a situation of this kind are contrary to sound planning and orderly development. Rigorous County monitoring to assure that actual development occurs in a fashion consistent with master plan representations and County code standards and criteria can achieve the same result.

## VII. RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

In this section, an appraisal of the loss of short-term beneficial or detrimental effects to long-term objectives and impacts will be presented. The various aspects of this particular discussion center on economic, physical, cultural/historical, and social considerations.

### AGRICULTURAL POTENTIAL VERSUS ECONOMIC RETURN FROM A RESIDENTIAL COMMUNITY

It has been shown throughout this report that the 480-acre Moana Project site has a very low potential for agriculture of any kind due to the soil conditions and lack of irrigating water. According to Jack Larsen, the agricultural consultant for the Moana Project, there is less than 20% to 25% of the entire site with adequate soil depths to cultivate any garden crops. The minimum soil depth for quality growth is about two feet for such crops as tomatoes, egg plant, cucumbers, and sweet potatoes. This minimum soil depth also presumes that the soil is good quality. The development of the site for such a use would generally be prohibitive. The expense would include: (1) clearing of the trees, scrub vegetation, rocks, (2) development of an irrigation water source, (3) extensive importation of topsoil, (4) purchase of machinery, seed, and fertilizers, (5) the construction of storage areas, and (6) employment of agricultural specialists and laborers. Against these costs, the only income would be the return from the crops that would be marketed. However, the quality of the crops grown at the Moana Project site is dubious, in view of the fact that competition would be severe from nearby areas where soil and irrigation are less of a problem.

A major open space feature of the proposed Moana Project is the 18-hole golf course. It is expected that the initial investment of the golf course will also be substantial because development and maintenance costs are considerable. However, it has been shown from previous experiences with other golf courses that golf courses are self-sustaining; and on well-used courses, profit is experienced within a short time period. A golf course appears to be more appropriate for the Koloa-Poipu area than agriculture. The principal reason for this statement is that if the Koloa-Poipu area is to be considered as a resort destination area, then a golf course is mandatory. Presently, tennis and beach-related activities are the sole recreational attractions of the area. A golf course would make the area's recreational scheme more comprehensive. Along with the recreational aspects, the golf course is a major green space area to be visually enjoyed by all. This certainly would be an improvement over the continuation of kiawe thickets existing there now. The Moana Project would augment the area as a resort destination area and attract more visitors, stimulate the economy, and create more jobs. The increased revenue could be channeled to uses such as historic preservation, expansion of public facilities, or other community-oriented activities, including the use of the amphitheater proposed at the Project.

#### UNALTERED OPEN SPACE VERSUS PROJECT LAND TRANSFORMATION

The Moana Project site is virtually unusable by the public at the present time, with the exception of the tennis complex. This is due to the dense strands of kiawe, rocky land, cow pastures, and barbed wire fences. Whatever archeological sites are present on the site are generally unknown and inaccessible to the public. With site development, the significant archeological sites will be incorporated into a park or open space areas and accessible for public enjoyment.

If the Moana Project is implemented, approximately 30% of the 480-acre site will be covered by buildings or roadways. The remaining land will be retained in some form of recreational or landscaped open space. As the development plan indicates, basically one of the major open space corridors within the Project will be along the entire length of the project boundary fronting Poipu Road. This will provide a highly attractive and green entrance landscape into the Poipu area, and will contribute substantially to eliminating the more "closed-in" feeling one now experiences as he enters Poipu.

#### LOCAL POPULATION VERSUS INTRODUCED POPULATION

In Census Tract 406, which is the Koloa-Poipu area, there is a resident population of about 2,900 people.<sup>1</sup> Over 50% of these residents were born on Kauai, and over 46% have lived on Kauai for the majority of their lives. By creating a resort destination area, which from an economic standpoint appears to be the most desirable long-range development policy, a new population will be introduced to the area. This new population will probably not be "local" in composition, and may have entirely different concerns than the local residents. In addition to this, the new population may be greater in size than the original population, and therefore the goals of this area may change.

The ten most important concerns of the Koloa-Poipu area were obtained as part of a survey taken in July-August of 1974 by Anderson et al.<sup>2</sup> The ten major concerns in order of their importance are as follows:

---

<sup>1</sup>Reference 23, p. 37.

<sup>2</sup>Reference 23, p. 91.

1. More land is needed for housing.
2. More employment is needed in agriculture.
3. There is too much land speculation.
4. Use of illegal drugs.
5. Too many of the young adults leave Kauai for training and good jobs.
6. There are too many short-term "transient" residents.
7. There should be better citizen participation in community decisions.
8. There are too many hotels on the island.
9. Not enough land is available to small farmers.
10. The population is growing too rapidly.

These concerns and their relationship to the proposed Moana Project at Poipu will be addressed in the following discussion:

1. The Moana Project will provide 1,150 units of condominium housing and 300 sites for the construction of single-family homes. It has been projected that 40% of Kauai's population can afford the lower priced lots at the proposed Moana Project and condominium absorption is not expected to pose any problems.
2. The Moana Project will not directly stimulate additional agricultural employment; however, as stated in No. 5 below, alternative employment opportunities will be generated by the project.
3. The Moana Project would discourage land speculation because the project is planned as a phased development with new residents moving into their homes as the units become available.
4. The use of illegal drugs is not pertinent to this discussion.

5. New jobs in golf course and resort management will be created by the Moana Project in addition to many manual labor opportunities. Also, the Moana Project will stimulate spin-off employment opportunities (i.e., commercial undertaking, service-oriented employment, tourism development).
6. In the discussion in the Kauai Socioeconomic Profile, "transients" were generally in the classification of "hippie" or persons with radically different lifestyles and means of support. The Moana Project will not attract this type of individual.
7. The Moana Corporation has given all the opportunities for citizen feedback, in compliance with the Environmental Impact Statement Regulations.
8. The Moana Project is not a hotel development, but a recreational/residential community. However, there will be a certain number of condominium units set aside for out-of-state visitors.
9. The availability of land to small farmers is not pertinent to this discussion since the Moana Project is not an agricultural development.
10. Population growth at some point is inevitable. Economic expansion, in this case in the area of tourism, requires that the population also experience growth. The two must go hand-in-hand to maintain a viable economic situation. The Kauai General Plan has stated that it is desirable that the Koloa-Poipu area be developed as a resort destination area. Therefore, it is felt that the population growth there is justified, although similar growth in prime agricultural land is deemed inappropriate.

With the above concerns voiced by the local residents, it can be foreseen that the new introduced population may bear the brunt of local resentment because of difference in lifestyle, income level, regard to the Koloa-Poipu area, and mobility. Unless efforts are made on both sides to understand the thinking of the other, and to promote interaction, there may be a potential of polarization and friction which would be undesirable in a resort destination area. The key to this problem will have to be understanding and cooperation for a cohesive new community.

APPENDIX A

UNFILLED JOB OPENINGS BY COUNTIES,  
JANUARY, 1975

One of the most difficult aspects of disseminating manpower information lies in the development of usable statistics. This difficulty is believed to arise from the complex nature of labor markets and the flexibility of the labor force. As an example, many workers are capable of filling any of the large number of occupations. Likewise, hiring requirements for occupations reflect a wide range of flexibility. Furthermore, individuals move from one occupation to another, into and out of the labor force and from one labor market to another.

Therefore, when interpreting Employment Service unfilled job openings, one should consider the possibility that the data are specific only to those employers who list their openings with the Employment Service and not representative of the universe of a particular occupation.

On the other hand, it is recognized that the value of the unfilled job openings data lies in its potential to provide some insights about the adequacy of demand and supply. When the number of job openings remaining unfilled for a month or more is large relative to the total number of job openings in an occupation, an indication that the sources of supply in the labor market are falling short of the requirements is presented in a preliminary form. In some respects, this presentation is aimed at providing this preliminary indication of an imbalanced labor demand and supply manpower situation.

The source of the follow data is Unfilled Job Openings Report, Research and Statistics Office, Department of Labor and Industrial Relations, State of Hawaii. The data are based on Hawaii State Employment Service unfilled job openings at the end of January, 1975.

# CORRECTION

THE PRECEDING DOCUMENT(S) HAS  
BEEN REPHOTOGRAPHED TO ASSURE  
LEGIBILITY  
SEE FRAME(S)  
IMMEDIATELY FOLLOWING

•genjlonag•

One of the most difficult aspects of disseminating manpower information lies in the development of usable statistics. This difficulty is believed to arise from the complex nature of labor markets and the flexibility of the labor force. As an example, many workers are capable of filling any of the large number of occupations. Likewise, hiring requirements for occupations reflect a wide range of flexibility. Furthermore, individuals move from one occupation to another, into and out of the labor force and from one labor market to another.

Therefore, when interpreting Employment Service unfilled job openings, one should consider the possibility that the data are specific only to those employers who list their openings with the Employment Service and not representative of the universe of a particular occupation.

On the other hand, it is recognized that the value of the unfilled job openings data lies in its potential to provide some insights about the adequacy of demand and supply. When the number of job openings remaining unfilled for a month or more is large relative to the total number of job openings in an occupation, an indication that the sources of supply in the labor market are falling short of the requirements is presented in a preliminary form. In some respects, this presentation is aimed at providing this preliminary indication of an imbalanced labor demand and supply manpower situation.

The source of the follow data is Unfilled Job Openings Report, Research and Statistics Office, Department of Labor and Industrial Relations, State of Hawaii. The data are based on Hawaii State Employment Service unfilled job openings at the end of January, 1975.



D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kaiai	
		Unfilled Openings	Days+								
		30		30		30		30		30	
		Total	Days+								
04	Life Sciences	18	17	16	16			1	1		1
040	Agricultural Sciences	1	1	1	1						
	040.081 Agricultural Scientist	1	1	1	1						
041	Biological Sciences	1	1	1	1						
	041.081 Biological Scientists	1	1	1	1						
045	Psychology	16	15	14	14			1	1		1
05	Social Sciences	4	2	3	1		1				
050	Economics	1		1							
	050.088 Economist	1		1							
054	Sociology	1	1								
	054.088 Sociologist	1		1							
055	Anthropologist	2	2	1	1		1				
	055.088 Anthropologist	2	2	1	1		1				
07	Medicine and Health	38	17	34	13		3		1		1
070	Medicine and Surgery	1		1							
	070.108 Physician	1		1							
074	Pharmacists	5	4	5	4						
075	Registered Nurses	9	1	9	1						
078	Medical and Dental Technology	6	4	6	4						
	078.281 Medical Technologist	3	3	3	3						
	078.381 Laboratory Assistant	3	1	3	1						
079	Medicine and Health, n.e.c.	17	8	13	4		3		1		1
	079.368 Medical Assistant	1	1						1		1
	079.378 Dental Assistant and I.P. Nurses	13	5	10	2		3				3

D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Days+								
		30		30		30		30		30	
09	Education	13	2	10	2						3
090	College and University Education	1									1
	090.228 Faculty	1									1
096	Home Economics and Farm Advising	1		1							
097	Vocational Education	9	1	7	1						
099	Education, n.e.c.	2	1	2	1						2
10	Museum, Library, and Archival Science	2		2							
100	Library Science	2		2							
	100.168 Chief Librarian	1		1							
14	Art	2	1	1				1	1		
142	Designers	1		1							
143	Photography	1	1					1	1		
15	Entertainment and Recreation	2		2							
152	Music	1		1							
153	Athletics and Sports	1		1							
16	Administrative Specialists	47	21	37	17	5	3	5	1		
160	Accounting and Auditing	13	4	12	4	1					
	160.188 Accountant	12	4	11	4						
162	Purchasing Management	1	1	1	1						
	162.158 Purchasing Agent	1	1	1	1						
163	Sales and Distribution Management	2	2			2	2				
165	Public Relations Management	4	2	4	2						
166	Personnel and Training Administration	14	10	12	9	2	1				

D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Total Days+								
168	Inspection, Investigation, Manager, Public Service	4	4								
169	Administrative Specialists, n.e.c.	9	2	4	1			5	1		
18	Managers and Officials	27	12	19	7	6	3	2	2		
182	Construction Industry Manager and Officials	2				2					
186	Finance, Insurance, Real Estate Manager and Officials	5	3	5	3						
	186.168 Manager	3	2	3	2						
187	Service Industry Manager and Officials	10	4	8	2	2	2				
	187.118 Director and Manager	2	2	1	1	1	1				
189	Miscellaneous Manager and Officials, n.e.c.	10	5	6	2	2	1	2	2		
	189.118 Director and Manager	2	1	2	1						
19	Miscellaneous Professional, Technical, and Manager, n.e.c.	102	84	69	62	21	17	12	5		
191	Agents and Appraisers	2	2	2	2						
193	Radio Operators	1	1			1	1				
195	Social and Welfare Work	91	77	61	57	20	16	10	4		
	195.108	7	6	6	5	1	1				
197	Ship Captains, Mates, Pilots, and Engineers	5	2	4	1			1	1		
199	Miscellaneous Professional, Technical, and Manager, n.e.c.	3	2	2	2			1			
2	Clerical and Sales										
20	Stenography, Typing, Filing, and Related	145	61	109	47	13	8	16	6	7	
201	Secretarial	21	5	14	1	1	1	5	4	1	
202	Stenography	25	14	19	11	4	3			2	

D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Days+								
203	Typist	11	2	8	2	1	1				1
204	Correspondence Clerk	1	1	1	1						
205	Personnel Clerk	8	8	8	8						
206	File Clerk	1		1							
208	Miscellaneous Office Machine Work	1	1	1	1						
209	Stenography, Typing, Filing and Related, n.e.c.	77	30	57	23	7	5	10	2	3	
	209.588 Clerk-Typist	34	17	23	13	4	3	6	1	1	
21	Computing and Account-Recording	101	16	77	13	6	6	14	3	4	
210	Bookkeeping	23	4	17	4	1	1	5			
211	Cashiering	9	3	5	1	1	1	3	2		
202	Teller Service	1		1							
213	Automatic Data Processing	6	2	6	2						
	213.582 Keypunch Operator	3		3							
214	Billing Machine Work	1		1							
215	Bookkeeping Machine Work	6		5				1			
219	Computing and Account-Recording, n.e.c.	55	7	42	6	4	4	5	1	4	
22	Material and Production Recording	66	5	9	2	1	1	52		4	2
221	Production Clerks	1		1							
222	Clerical, Shipping and Receiving	1		1							
223	Stock Checking and Related Work	64	5	7	2	1	1	52		4	2
23	Information and Message Distribution	37	18	30	17	3	3	1	1	3	
230	Messengers, Errand Boys, and Office Boys and Girls	3		3							
231	Mail Clerks	1	1	1	1						
235	Telephone Work	8	8	7	7	1	1	1	1		

D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Days+								
		30		30		30		30		30	
		Total	Days+								
237	Reception and Informating Dispensing Work	17	1	11	1	2		1		3	
239	Information and Message Distribution, n.e.c.	8	8	8	8						
24	Miscellaneous Clerical Work	24	3	15	3	1		3		5	
240	Collecting	2		2							
242	Hotel Desk Work, n.e.c.	5		5							
243	Clerical Work, Direct Service, n.e.c.	2		2							
249	Miscellaneous Clerical Work, n.e.c.	15	3	6	3	1		3		5	
	249.368 Reservation Clerk	11	2	5	2	1		1		5	
25	Saleswork, Services	16	13	9	6			7		7	
250	Saleswork, Real Estate and Insurance	10	9	3	2			7		7	
251	Saleswork, Securities	2	2	2	2						
258	Saleswork, Printing and Advertising	3	1	3	1						
259	Saleswork, Services, n.e.c.	1	1	1	1						
26											
27											
28	Salemen and Salesperson, Commodities	78	27	49	12	7	3	21	12	1	
262	Foodstuff, Beverage, Tobacco	1		1							
263	Textile, Textile Production, Apparel	5	2	2				2	2	1	
265	Paper and Paper Products	1		1							
266	Chemical and Drug Preparations	1		1							
274	House Furnishing	7	4	5	2			2	2		
275	Hotel and Restaurant Equipment and Supplies	2		2							



D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Days+								
		30	30	30	30	30	30	30	30	30	30
309	Domestic Services, n.e.c.	14	2	1	2	2	2	11			
31	Food and Beverage Preparation and Service	182	88	27	20	13	57	44	20	4	
310	Hostesses and Stewards, Food, Beverage, Service, Except Ship Steward	4		3					1		
311	Food Service	93	49	17	8	5	31	25	10	2	
312	Bartender	7	3	1	3	1	1	1	1		
313	Chefs and Cooks, Large Hotel and Restaurants	21	9	5	1	1	3	3	1		
314	Chefs and Cooks, Small Hotel and Restaurants	6	4	1	1	1	1	1	1	1	
315	Miscellaneous Cooks, Except Domestic	1		1							
316	Meatcutters, Except Slaughtering and Packing	2	2		1	1	1	1			
317	Miscellaneous Food and Beverage Prep.	4	2					4	2		
318	Kitchen Workers	39	19	14	6	4	13	11	6	1	
319	Food and Beverage Preparation and Service, n.e.c.	5		2			3				
32	Lodging and Related Service	73	46	12	10	7	44	26	7	6	
323	Maids and Housemen, Hotels, Restaurants, and Related	72	46	12	10	7	44	26	6	6	
324	Bellman and Related	1							1		
33	Barber, Cosmetology and Related Services		8	5	3		3	3			
330	Barbers	3	1	2			1	1	1		
332	Hairdresses and Cosmetologists	5	5	3			2	2			

D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Days+								
		30		30		30		30		30	
34	Amusement and Recreation Services	1	1		1		1				
341	Golf, Tennis, Skating and Related Facilities Attendant	1	1		1		1				
35	Miscellaneous Personal Services	21	14	11	4	8	8	2	2		
352	Hostesses and Stewards	1	1	1	1						
353	Guides, Except Fishing and Hunting	6	5	2	1	3	3	1	1		
354	Unlicenses Midwives and Practical Nurses	1		1							
355	Attendants, Hospital, Morgues and Related Health Services	11	7	6	2	4	4	1	1		
356	Animal Care, n.e.c.	2	1	1		1	1				
36	Apparel and Furnishing Service	4	2	3	1	1	1				
361	Laundrying	1		1							
	361.885 Shirt Presser	1		1							
363	Pressing	1		1							
	* 363.885 Shirt Presser	1		1							
	Shoe and Luggage Repair and Related Services	1	1	1	1						
369	Apparel and Furnishing Services	1	1			1	1				
37	Protective Service	140	52	115	33	9	3	16	16		
372	Guards and Watchmen, Except Crossing Watchmen	128	45	107	28	5	1	16	16		
375	Policemen and Detectives, Public Service	4	2	2	2	2	2				
376	Policemen and Detectives, Except in Public Service	4	1	4	1						
379	Protective Services, n.e.c.	4	4	2	2	2	2				

D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	30 Days+								
38	Building and Related Services	122	64	72	31	11	10	36	23	3	3
381	Porters and Cleaners	93	41	54	15	11	10	25	16	3	3
382	Janitors	19	16	17	16			2			
389	Building and Related Services, n.e.c.	10	7	1				9	7		
4											
40	Plant Farming	100	74	64	56	18	10	14	7	4	1
404	Fruit and Nut Farming	1						1			
406	Horticultural Specialty	14	8	11	7	1	1			2	
407	Gardening and Groundskeeping	80	61	48	44	17	9	13	7	2	1
409	Plant Farming, n.e.c.	5	5	5	5						
41	Animal Farming	1				1					
413	Livestock Farming	1				1					
43	Fishery and Related Work	3	2	2	1			1	1		
432	Line Fishing	1		1							
436	Marine Life Cultivation and Related Work	2	2	1	1			1	1		
5	Processing										
50	Metal Processing	3		3							
509	Metal Processing	3		3							
52	Processing of Food, Tobacco and Related Products	15	5	7	1	4	2	4	2		
523	Heating, Render, Melt, Dry, Cool, Freeze and Related	2									
524	Coating, Icing, Decorating and Related	1		1				2			

D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Total Days+								
525	Slaughtering, Breaking, Curing, and Related	2	1			1					
526	Cooking and Banking	2	2	1	1	1	1				
	526.884 Doughnut Maker	1	1			1	1				
529	Processing Food, Tobacco and Related Products, n.e.c.	8	3	4	4	2	1	2	2		
54	Process of Petroleum, Coal, Natural and Manufactured Gas and Related Products	1	1	1	1						
549	Process of Petroleum, Coal, Natural and Manufactured Gas and Related Products	1	1	1	1						
55	Processing of Chemicals, Plastics, Synthetic Rubber, Paint and Related Products	1	1								
559	Processing of Chemicals, Plastics, Synthetic Rubber, Paint and Related Products	1	1								
57	Processing of Stone, Clay, Glass and Related Products	1	1								
579	Processing of Stone, Clay, Glass and Related Products	1	1								
6	Machine Trade										
60	Metal Machining	6	5	3	2	2	2	1	1		
600	Machinist and Related	6	5	3	2	2	2	1	1		
61	Metalworking, n.e.c.	1		1							
619	Miscellaneous Metalworking, n.e.c.	1		1							
62											
63	Mechanics and Machinery Repairmen	48	29	35	20	8	5	4	3	1	1



D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Days+								
		30		30		30		30		30	
		Total	Days+								
620	Motor Vehicle and Engineering Equip- ment Mechanic and Repairman	34	20	25	14	5	3	4	3		
623	Marine Mechanic and Repairman	1		1							
625	Engine, Power Transmission and Related Mechanic	3	2	1	1	1				1	1
630	General Industry Mechanic and Repairman	1	1	1	1						
633	Business and Commercial Machine Repairman	2	2	1	1	1	1				
637	Utilities Service Mechanic and Repairman	3	2	3	2						
	637.884 Mechanic Helper	1	1	1	1						
638	Miscellaneous Machine Installation and Repair	2	2	1	1	1	1				
639	Mechanic and Machinery Repairman, n.e.c.		2		2						
65	Printing	1	1	1	1						
651	Printing Press Work	1	1	1	1						
66	Wood Machining	3	2	2	1	1	1				
660	Cabinet Makers	2	2	1	1	1	1				
669	Wood Machine, n.e.c.	1		1							
7	Bench Work										
70	Fabricate, Assemble and Repair of Metal Products, n.e.c.	7		4						3	
700	Fabricate, Assemble and Repair of Jewelry, Silver and Related Products	1		1							
709	Fabricate, Assemble and Repair of Metal Products, n.e.c.	6		3						3	

D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	30 Days+								
71	Fabricate, Repair of Scientific and Medical Apparatus, Photographic and Optical Goods, and Related Products	1		1							
719	Fabricate, Repair of Scientific and Medical Apparatus, Photographic and Optical Goods, and Related Products, n.e.c.	1		1							
72	Assembly and Repair of Electrical Equipment	6	5	4	3	2	2				
720	Assembly, Repair, Radio, television, Receiving Sets, Phonographs	4	4	3	3	1	1				
	720.281 T.V. and Radio Repairman	4	4	3	3	1	1				
	720.281 T.V. and Radio Repairman	1	1			1					
722	Assembly and Repair Communications Equipment	1		1							
723	Assembly and Repair of Electrical Appliances and Tixtures	1		1							
	723.884 Appliance Repairman and Assembler	5	1	1	1				4		
73	Fabricate and Repair of Products Made From Assorted Materials	5	1	1	1						
	739 Fabricate and Repair of Products Made From Assorted Materials, n.e.c.	2	1	2	1						
	74 Painting, Decorating and Related	2	1	2	1						
	741 Painters, Spray	1	1	1	1						
75	Fabricate and Repair of Plastics, Synthetic Rubber and Related Products	1	1	1	1						
	754 Fabricate and Repair of Miscellaneous Plastic Products	1	1	1	1						

# CORRECTION

THE PRECEDING DOCUMENT(S) HAS  
BEEN REPHOTOGRAPHED TO ASSURE  
LEGIBILITY  
SEE FRAME(S)  
IMMEDIATELY FOLLOWING

•senoJnoSliw•



D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Days+								
		30		30		30		30		30	
		Total	Days+								
76	Fabricate and Repair of Wood Products	1	1					1	1		
761	Laying Out, Cut, Carve, Shape and Sand Wood Products, n.e.c.	1	1					1	1		
77	Fabricate and Repair of Sand, Stone, Blay and Glass Products	1		1							
773	Coloring and Decoration of Brick, Tile, and Related Products	1		1							
78	Fabricate and Repair of Textiles, Leather and Related Products	15	11	13	10	2	1				
781	Laying Out, Marking, Cutting and Punch- ing, n.e.c.	2	1	1	1	1	1				
785	Tailors and Dressmakers	6	6	5	5	1	1				
786	Sewing Machine Operators, Garment	3	2	3	2						
787	Sewing Machine Operators, Non-Garment	3	1	3	1						
789	Fabricate and Repair of Textiles, Leather and Related Products, n.e.c.	1	1	1	1						
8	Structural Work										
80	Metal Fabricating, n.e.c.	22	15	18	11			4	4		
801	Fitting, Bolting, Screwing and Related	4	4					4	4		
804	Tinsmiths, Coppermiths and Sheet Metal Workers	1	1	1	1						
	804.281 Sheet Metal Worker	1	1	1	1						
807	Bodymen, Transportation Equipment	17	10	17	10						
81	Welders, Flamecutters and Related	7	4	6	3	1	1				
812	Combination Arc Welders and Gas Welder	7	4	6	3	1	1				



D.O.T. Code	Occupational Titles	State		Honolulu		Hawaii		Maui		Kauai	
		Unfilled Openings	Days+								
85	Excavating, Grading, Paving and Related	9	3	2	1	5	2				
850	Excavating, Grading and Related	4	1			4	1				
853	Asphalt Paving	3		1				2			
859	Excavating, Grading, Paving and Related n.e.c.	2	2	1	1	1	1				
86	Construction	196	109	25	17	13	158	92			
860	Carpenters and Related	58	19	10	4	11		37	15		
	860.887 Helper and Laborer	3	1	1	1			2			
861	Brick and Stone Masons and Tile Setters	2	2	2	2						
862	Plumbers, Gas Fitters, Steam Fitters and Related	10	7	7	6	1		2	1		
	862.884 Plumber Helper	4	2	1	1	1		2	1		
863	Asbestos and Insulation Workers	2	2	1	1			1	1		
866	Roofers and Related	4	1	2	1			2			
869	Miscellaneous Construction, n.e.c.	120	78	3	3	1		116	75		
89	Structural Work, n.e.c.	15	8	7	4	2	2	6	2		
891	Structural Maintenance, n.e.c.	4	3	3	2	1	1				
899	Miscellaneous Structural Work, n.e.c.	11	5	4	2	1	1	6	2		
9	Miscellaneous Work										
90	Motor Freight	42	16	28	10	4	1	8	5	2	
902	Dump Truck Drivers	1						1			
904	Trailer Truck Drivers	1				1					
905	Truck Drivers, Heavy	12	5	6	1	1		4	4	1	
906	Truck Drivers, Light	21	4	15	2	2	1	3	1	1	
909	Motor Freight, n.e.c.	7	7	7	7						



APPENDIX B

LABOR MARKET CONDITION BY SELECTED OCCUPATIONS

LABOR MARKET CONDITION BY SELECTED OCCUPATIONS<sup>1</sup>  
(Outlook for July-September, 1975)

Technical Notes

Alpha Code:

- D Demand -- Number of fully qualified workers available in the area is less than the number of job openings.
- B Balance -- The number of fully qualified workers available in the area is generally sufficient for the number of job openings.
- S Surplus -- Number of fully qualified workers available in the area is significantly greater than the number of job openings.

Salary/Wage Ranges:

The salary/wage column represents those salaries and wages in Honolulu which are "offered" by firms and not the prevailing wage rates. The data in this column are derived from the Hawaii Employment Service local offices.

\*Denotes job titles which primarily reflect state and local government civil service occupations and salary ranges.

\*\*Denotes room and board.

<sup>1</sup>Source: Department of Labor and Industrial Relations, State of Hawaii, Occupational Employment Trends, July, 1975.

Occupation	Wage/Salary Ranges	Counties			Comments
		Oahu	Hawaii	Maui Kauai	
PROFESSIONAL, TECHNICAL, AND MANAGERIAL OCCUPATIONS:					
Accountant/Auditor	\$600+	B	B		Occasional recruitment difficulties for experienced applicants.
Administrative Assistant; Chief Clerk; Office Manager	\$600-1,000	S			Adequate supply of college graduates, military retirees and in-migrants. Considerable turnover. Mismatching of salary offer and expectation.
Dental Assistant	\$375+	B			
Drafter:					
Architectural	\$700+	B			Occasional recruitment difficulties for experienced applicants.
Civil	\$650+	B			Occasional vacancies with occasional recruitment difficulties.
Electrical	\$2.25-5.00	B			Occasional vacancies with occasional recruitment difficulties.
Mechanical	\$650+	B			Shortage of applicants with experience in air conditioning, plumbing, etc.
Engineer, Civil	\$800+	D			Requirements for licenses or experienced engineers.
Engineer, Mechanical	\$800+	B			Occasional recruitment difficulties for applicants with specialized experience.
Managerial:					
Executive Trainee	\$550+	S			Surplus of college graduates and in-migrants from Mainland.
Apartment House	\$250-350 + apt.	B			Occasional need for husbands and wives who can remain on premises.
Hotel	\$600-1,000	S			Occasional vacancies although most positions filled from within.
Personnel	\$660-1,000	S			Infrequent vacancies.



Occupation	Wage/Salary Ranges	Counties			Comments
		Oahu	Hawaii	Maui	
Restaurant/Coffee Shop	\$650-1,000	S			Adequate supply of applicants to meet demand. Occasional demand for experienced restaurant managers.
Sales	\$600-1,000	S	B	B	Occasional demand with new developments in the retail trade industry.
Nurse, Licenses Practical	\$550+	D	D	B	Lack of qualified applicants willing to work shifts.
Nurse, Registered	\$750+	D	B	B	Occasional need for applicants with specialty skills and training.
Programmer	\$700+	B			Demand for experienced applicants. Some mismatch of machine and language requirements.
Public Relations	\$550-800+	S			More than adequate supply of applicants.
Social Worker I-III*	\$652-874	B	B	B	Occasional vacancies. Adequate supply of applicants.
Systems Analyst	\$800+	B			Salary effective September, 1975.
Teacher, Elementary	\$777-842	S			Salary effective September, 1975.
Teacher, Secondary*	\$777-842	S			Demand for ASCP-registered technologists willing to work shifts.
Technologist, Medical	\$750+	D			Need for licensed technicians.
Technologist, Radiologic	\$700+	D			
CLERICAL AND SALES OCCUPATIONS:					
Accounting Clerk	\$450-575	B	B	B	Mismatching of salary offer and expectation.
Bookkeeper	\$500-600+	B	B	D	Mismatching of salary offer and expectation. Lack of qualified applicants on Maui.
Bookkeeping Machine Operator	\$416	B			Mismatching of applicant's demands with employer's requirements and salary offer.
Clerk, General	\$275-350	S	S	S	Occasional mismatching of salary offer and expectation; however, adequate applicant supply.

Occupation	Wage/Salary Ranges	Countries				Comments
		Oahu	Hawaii	Maui	Kauai	
Clerk, General Office	\$475-575	B	B	B	B	Mismatching of applicant's demands with employer's requirements and salary offer.
Clerk-Typist	\$450+	B	B	B	B	Occasional lack of applicants with good typing skills. Some mismatching of salary offer and expectation.
Hotel Clerk	\$2.50-3.00	B	B	B	B	Occasional recruitment problems for shift work and experienced applicants with bilingual skills.
Keypunch Operator	\$500	B				Occasional recruitment problems due to shift work. Some mismatching of salary offer and expectation.
Personnel Clerk	\$500	S				Infrequent vacancies and adequate supply.
Receptionist	\$416-475	S				Adequate supply except for applicants with good typing skills.
Retail Cashier	\$2.50+	S		B		Adequate applicant supply.
Sales Clerk	\$2.40+	S	B	S	B	Adequate applicant supply. Some difficulty due to bilingual requirements.
Sales Associate, General	\$500-900+	B		S		Adequate applicant supply. Considerable demand for insurance selling
Secretary	\$500-600+	B	B	B	B	Moderate need for qualified legal and medical secretaries. Mismatching of salary offer and expectation. Lack of applicants with good shorthand skills.
Stenographer	\$500-575+	B		B	B	Mismatching of salary offer and expectation. Offers are for entry level salaries.
Stock Clerk	\$2.40-3.00+	S				Occasional recruitment problems for overseas work; however, adequate applicant supply.
Teller	\$430	B	B	B	B	Mismatching of salary offer and expectation. Constant turnover.
Telephone Operator	\$416	B				Some mismatching of salary offer and expectation. Lack of interested applicants for shift, weekend, and holiday work.

1 3 3 1

Occupation	Wage/Salary Ranges	Countries			Comments
		Oahu	Hawaii	Maui	
Transcribing Machine Operator	\$435-583	B			Occasional recruitment problems due to lack of applicants willing to accept continuous typing. Some mismatching of salary offer and expectation.
SERVICE OCCUPATIONS:					
Baker	\$2.50-4.60	B			
Bartender	\$2.75+	S	S	B	Adequate supply of applicants.
Dish Carrier	\$2.40 plus tips	S	D	B	Lack of interested applicants on Maui.
Room Cleaner	\$2.40-2.95	B	D	B	Lack of interested applicants on Maui.
Charworker	\$2.40-3.00	D	D	B	Constant turnover. Lack of interested applicants.
Child Monitor	\$100+**	D			Lack of interested applicants.
Cleaner, Home	\$150-300+**	D			Lack of applicants interested in live-in work.
Cook	\$2.50-4.25	B	B	B	Mismatching of salary offer and expectation. Lack of qualified applicants.
Cosmetologist	\$2.40 + commission or commission only	B	D	B	Lack of interested applicants on Maui.
Counter Attendant	\$2.40	D	D	B	Lack of interested applicants to match salary offers and shifts.
Dayworker	\$2.50-3.00	B			
Dishwasher	\$2.40+	B			
Exterminator, Termite	\$2.50+	B			
Guard/Security Officer	\$2.40-3.76	D	D	D	Some mismatching of salary offer and expectation and lack of qualified applicants.
Host/Hostess, Restaurant/Coffee Shop	\$2.50	S			Adequate supply of applicants.

Occupation	Wage/Salary Ranges				Counties				Comments
	Oahu	Hawaii	Maui	Kauai	Oahu	Hawaii	Maui	Kauai	
Kitchen Helper	\$2.40-3.00	S	B	B	B	B	B	B	Adequate supply of applicants. Occasional recruitment problem due to shift work.
Meat Cutter	\$3.00-6.09	B							Occasional need for experienced journeymen.
Nurse Aid	\$2.40-3.39	B						B	Occasional recruitment problems for shift work.
Pantry Worker	\$2.40-4.17	S							Oversupply of applicants.
Presser, Hand and Machine	\$2.40+	D							Lack of interested applicants.
Waiter/Waitress	\$2.40-3.25+ tips	S	B	D	D	B	B	B	Adequate supply of applicants. Lack of interested applicants on Maui.
Washer, Machine	\$2.40	D							Lack of interested applicants.
Yard Worker	\$2.50	D							Lack of interested applicants.
FARMING, FISHERY, AND RELATED OCCUPATIONS:									
Farmhand, Fruit	\$2.40	D	B	D	D	D	D	D	Requirements for pineapple harvesters.
Farmhand, Sugar	\$3.10	B	B	B	B	B	B	B	
Fisher	% of catch	B							
Groundskeeper	\$2.40-3.00	D						B	Lack of interested applicants.
Nursery Worker	\$2.40	B							
Nut Process Helper	\$2.40+							B	Wage rate for Hawaii County.
MACHINE TRADES OCCUPATIONS:									
Aircraft Mechanic	\$3.00-5.50	S							Adequate supply of applicants.
Auto Mechanic	\$3.00-6.02	D	B	D	D	D	D	D	Lack of first-class workers.
Blacksmith	\$6.38	B							
Business Machine Mechanic	\$2.50-3.50	B						B	Occasional need for specific experience.
Cabinetmaker	\$2.50-3.50	B							
Diesel Mechanic	\$4.63-7.93	B	B					B	Occasional need for journeymen.
Offset-Press Operator	\$2.50-5.00	B							
Refrigeration Mechanic	\$4.00-5.50	B							Occasional need for first-class mechanics.



Occupation	Qage/Salary Ranges	Counties			Comments	
		Oahu	Hawaii	Maui		Kauai
Machinist	\$5.00-6.50	B				
Machinist, Marine	\$6.38	D			Lack of qualified applicants.	
Molder	\$6.38	B				
BENCHWORK OCCUPATIONS:						
Alteration Finisher	\$2.40-3.50	D			Lack of qualified applicants.	
Dental Lab Technician	\$2.40+	B				
Sewing Machine Operator	\$2.40-2.50	D	B	B	B	Lack of qualified and interested applicants.
Television and Radio Servicer	\$3.25-4.00	B				
STRUCTURAL WORK OCCUPATIONS:						
Auto Body Worker	\$3.00-5.50	D			Lack of qualified applicants.	
Boilermaker	\$4.96-8.26	B				
Bricklayer	\$4.10-7.45	B				
Carpenter	\$3.85-7.28	B	B	B	B	
Cement Mason	\$4.10-7.45	B				
Combination Welder	\$4.45-6.40	B				
Construction Worker	\$2.50-6.49	S	S	B	S	Occasional vacancies but adequate supply of applicants.
Electrical Appliance Servicer	\$2.75-5.00	B				
Electrician	\$5.00-9.08	B				
Electronic Mechanic	\$4.06-6.19	B			B	Occasional need for applicants with specialized experience.
Floor Layer	\$4.29-7.15	B				
Glazier	\$4.60-8.37	B				
Insulation Worker	\$4.56-7.60	B				
Maintenance Mechanic	\$ .250-6.50	B				
Operating Engineer	\$5.65-8.65	B			B	Occasional vacancies. Mismatching of salary offer and expectations.
Painter	\$3.44-7.61	B			B	



APPENDIX C

KIAHUNA TRAVEL QUESTIONNAIRE

TRAVEL QUESTIONNAIRE

To Kiahuna guests:

As part of a study which we are doing for Kauai County, we are conducting a survey of the travel patterns of Kiahuna guests. We are interested in ensuring the development of the Poipu Beach area in a way which creates maximum recreational opportunities. At the same time, it is important to understand the potential impact of additional traffic in the area, and to create on-site facilities which will reduce automobile use.

Your participation in this survey is important.

Will you please answer the following questions on the last day of your stay, and give this form to the desk clerk when you check out. Even though you may not be able to give precise answers, please give your best estimates.

Thank you for your cooperation.

Moana Corporation



a. Off-site travel for shopping

- i. One trip a week . . . . . \_\_\_\_\_
- ii. Two trips a week . . . . . \_\_\_\_\_
- iii. Three trips a week . . . . . \_\_\_\_\_
- iv. Four trips a week . . . . . \_\_\_\_\_
- v. One trip a day . . . . . \_\_\_\_\_
- vi. Two trips a day . . . . . \_\_\_\_\_
- vii. Three trips a day . . . . . \_\_\_\_\_
- viii. Four or more trips a day . . . . . \_\_\_\_\_

b. Off-site travel for recreation

- i. One trip a week . . . . . \_\_\_\_\_
- ii. Two trips a week . . . . . \_\_\_\_\_
- iii. Three trips a week . . . . . \_\_\_\_\_
- iv. Four trips a week . . . . . \_\_\_\_\_
- v. One trip a day . . . . . \_\_\_\_\_
- vi. Two trips a day . . . . . \_\_\_\_\_
- vii. Three trips a day . . . . . \_\_\_\_\_
- viii. Four or more trips a day . . . . . \_\_\_\_\_

7. When you left Kiahuna for recreational purposes, what was the average number of people in your car, including the driver?

- a. One person . . . . . \_\_\_\_\_
- b. Two people . . . . . \_\_\_\_\_
- c. Three people . . . . . \_\_\_\_\_
- d. Four people . . . . . \_\_\_\_\_
- e. Five people . . . . . \_\_\_\_\_
- f. Six people . . . . . \_\_\_\_\_

8. If you were to return to Kiahuna, and the following facilities existed within Kiahuna, would the number of your off-site automobile trips decrease substantially? Please indicate the number of automobile trips you think you would take for the indicated purposes.

a. Off-site travel for recreation

(Assume that Kiahuna has on-site, an 18-hole golf course, a clubhouse and restaurant, a swimming pool and expanded tennis courts and tennis clubhouse.)

- i. One trip a week . . . . . \_\_\_\_\_
- ii. Two trips a week . . . . . \_\_\_\_\_
- iii. Three trips a week . . . . . \_\_\_\_\_
- iv. Four trips a week . . . . . \_\_\_\_\_
- v. One trip a day . . . . . \_\_\_\_\_
- vi. Two trips a day . . . . . \_\_\_\_\_
- vii. Three trips a day . . . . . \_\_\_\_\_
- viii. Four or more trips a day . . . . . \_\_\_\_\_

b. Off-site travel for shopping

(Assume that Kiahuna has on-site, a convenience shopping center including such facilities as a grocery store, liquor store, laundry and cleaners, and sports shop.)

- i. One trip a week . . . . . \_\_\_\_\_
- ii. Two trips a week . . . . . \_\_\_\_\_
- iii. Three trips a week . . . . . \_\_\_\_\_
- iv. Four trips a week . . . . . \_\_\_\_\_
- v. One trip a day . . . . . \_\_\_\_\_
- vi. Two trips a day . . . . . \_\_\_\_\_
- vii. Three trips a day . . . . . \_\_\_\_\_
- viii. Four or more trips a day . . . . . \_\_\_\_\_

\*\*\*\*\*

Thank you for taking the time to respond to this questionnaire.  
Please hand it to the desk clerk when you leave.

\_\_\_\_\_  
Signature of person filling out questionnaire. (Your signature, while preferred, is optional. Please return the questionnaire even if you choose not to sign it.)

APPENDIX D

REFERENCES

BIBLIOGRAPHY - PART I

Anderson, R. M., G. R. Vieth, B. J. Seidenstein, B. Bradshaw, Kauai Socioeconomic Profile, Center for Non-Metropolitan Planning and Development, University of Hawaii, Honolulu, 1975.

Aotani and Hartwell Associates, Inc., (Draft) State Comprehensive Outdoor Recreation Plan, prepared for the Department of Planning and Economic Development, 1975.

Bank of Hawaii, Department of Business Research, Hawaii '74 Annual Economic Review, Honolulu, 1974.

County of Kauai

Subdivision Ordinance for the County of Kauai, Bill No. 157 (as amended), Ordinance No. 175.

Comprehensive Zoning Ordinance, Ordinance No. 164.

County of Kauai Operating Budget Ordinance, Ordinance No. B-12-75, Bill No. 319 (as amended), fiscal year 1975-76.

County of Kauai Operating Budget Ordinance, Ordinance No. B-1, Bill No. 43, fiscal year 1975-76.

Annual Report, Kauai Police Department, 1970 and 1974.

A General Plan for Domestic Water for the Island of Kauai, Department of Water, 1972.

\*\*\*

First Hawaiian Bank, Department of Economic Research, Economic Indicators, monthly.

Goldman, George E. and Anthony T. Nakazawa, A Technical Guide to the Construction of County Input-Output Models: The Santa Barbara Case, University of California Cooperative Extension, Berkeley, 1974.

Hawaii Visitors Bureau, Annual Research Report, Honolulu, 1974.

Miernyk, W. H., The Elements of Input-Output Analysis, Random House, 1975.

Miyoshi, G.I., The Kauai Community Occupational Survey, Kauai Community College, 1974.

Richardson, H.W., Regional Economics, Praeger Publishers, 1969.

State of Hawaii

Financial Report on Operating and Capital Improvement Project Funds, Department of Education, 1974.

Statistical Report, Department of Health, 1973.

Chapter 43 Air Pollution Control, Public Health Regulations, Department of Health, 1975.

The State of Hawaii Data Book, Department of Planning and Economic Development, 1974.

Characteristics of the Insured Unemployed, Department of Labor and Industrial Relations, 1974.

Estimation of Employment and Unemployment in Hawaii, Department of Labor and Industrial Relations, 1974.

Labor Area Summary, Department of Labor and Industrial Relations, 1975.

Occupational Employment Trends, Department of Labor and Industrial Relations, 1975.

Selected Manpower Indicators for Kauai County, Department of Labor and Industrial Relations, 1972.

Unfilled Job Openings Report, Department of Labor and Industrial Relations.

Tax Foundation of Hawaii, Government in Hawaii, Honolulu, 1974, 1975.

U.S. Department of Commerce, Bureau of the Census, General Social and Economic Characteristics, PHC(1)-C13, Washington, D.C., 1970.

U.S. Department of Labor, Manpower Administration, Selected Manpower Indicators -- Public Employment Program, based on the 1970 Census Fourth Count, Washington, D.C., 1970.

Wallace, L.T., G. Goldman, R. H. Tyler, J. Hart, A Framework for Analyzing Public Service Costs and Revenues Associated with Land Use Alternatives, University of California Cooperative Extension, Berkeley, 1973.

BIBLIOGRAPHY - PART II

1. Aotani and Hartwell Associates, Inc., State Comprehensive Outdoor Recreation Plan (Draft), 1975.
2. Corps of Engineers, U.S. Army Engineer District, Honolulu, Flood Plain Information Study - Koloa-Poipu, Kauai, Hawaii, Main Report and Technical Appendix, Honolulu, Hawaii, October, 1966.
3. Council on Environmental Quality, Environmental Quality -- The First Annual Report of the Council on Environmental Quality, Washington, D.C., August, 1970.
4. Cox, D.C., D.A. Davis, G.A. MacDonald, Geology and Ground-water Resources of the Island of Kauai, Hawaii, Hawaii Division of Hydrography, State of Hawaii, 1960, pp. 120-123, pp. 135-139.
5. Department of Agriculture, United States, Soil Survey Interpretations - Kauai, Report R41, Soil Conservation Service, Honolulu, Hawaii, January 1972.
6. Department of Agriculture, United States, Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, Soil Conservation Service, Washington, D.C., August, 1972.
7. Department of Education, State of Hawaii, Kauai Complex Facilities Development Plan, 1975-1995.
8. Department of Health, State of Hawaii, "Public Health Regulations," Water Quality Standards Chapter 37-A, 1974.
9. Department of Health, State of Hawaii, Statistical Report, 1973.
10. Department of Land and Natural Resources, State of Hawaii, Annotated Checklists of the Birds and Mammals of Hawaii, Division of Fish and Game, Revised 1975.
11. Department of Land and Natural Resources, State of Hawaii, Pan Evaporation in Hawaii 1894-1970, Division of Water and Land Development, Report R 51, January, 1973.
12. Department of Transportation, State of Hawaii, Traffic Summary, Island of Kauai, 1971, Highways Division.
13. Department of Water, County of Kauai, A General Plan for Domestic Water/Island of Kauai, Report R40, February, 1972, pp. 54-59.

14. Graefe, Volker, William Patzert, Klaus Wyrski, Current Observations in the Hawaiian Archipelago, Hawaii Institute of Geophysics, University of Hawaii, April, 1971, pp. 1-25, current meter station #8, 12, 13.
15. Hawaiian Historical Society, Forty-Fourth Annual Report of the Hawaiian Historical Society for the Year 1935, Honolulu, Hawaii, May, 1936.
16. Hawaiian Sugar Planters Association, Hawaiian Sugar Manual, Washington, D.C., 1975.
17. Hawaii Water Resources Regional Study, Surface and Ground Water Resources, Honolulu, Hawaii, April, 1975, pp. 343-360, pp. 392-402.
18. Highway Research Board - National Academy of Sciences, National Research Council, Highway Capacity Manual 1965, Division of Engineering and Industrial Research, Special Report 07, Publication 1328, Washington, D.C.
19. Honolulu Star Bulletin, State Noise Regulations, May 23, 1973, p. B-6.
20. Land Study Bureau, University of Hawaii, Detailed Land Classification - Island of Kauai, L.S.B. Bulletin No. 9, Honolulu, Hawaii, December, 1967.
21. Sinoto, Akihiko, Archeological Reconnaissance Survey of Knudsen Trust Lands at Koloa-Poipu, Kauai, Bishop Museum, Department of Anthropology, Honolulu, Hawaii, August, 1975.
22. Water Resources Research Center, University of Hawaii, Quality of Coastal Waters, Second Annual Progress Report, Honolulu, Hawaii, September, 1973, pp. 154-162.
23. Center for Nonmetropolitan Planning and Development, College of Tropical Agriculture, University of Hawaii, Kauai Socio-economic Profile, Departmental Paper 35, Honolulu, Hawaii, May, 1975.

PERSONS, AGENCIES, AND ORGANIZATIONS CONTACTED

PART I

County of Kauai

Timothy Albao  
Chief Accountant  
Finance Department

Tom Shigemoto  
Planner  
Department of Planning

George Costa  
Captain of Patrol Division  
Kauai Police Department

Gregg Fujikawa  
Civil Engineer  
Department of Water

Frank Rita  
Fire Chief  
Kauai Fire Department

Stanley Wakayama  
Supervisor of Billing and  
Pre-Audit  
Department of Water

Wilson Miyashiro  
Superintendent  
Parks and Recreation Department

Harry Funamura  
Health and Environmental Ser-  
vice Department

State of Hawaii

Reginald P. Gage, III  
Real Property Assessor  
Department of Taxation, Lihue

Robert Melton  
District Health Officer  
Department of Health, Lihue

Ed Matsushige  
Staff Specialist  
Department of Education, Lihue

David Iha  
Fiscal Officer  
Kauai Community College

Barton H. Nagata  
District Superintendent  
Department of Education, Lihue

Gary R. Vieth  
Department of Agricultural  
Economics  
University of Hawaii, Honolulu

Donna Garcia  
Regional Librarian  
Hawaii Public Library System, Lihue

Other Organizations

Kelvin Kai  
Manager, Engineering Section  
Kauai Electric Co., Eleele

Betty Bell  
Administration  
Wilcox Memorial Hospital, Lihue

Henry Naganuma  
Senior Sales Representative  
Gasco, Inc., Lihue

Seigo Kagawa  
Office Manager  
Pacific Ambulance Service, Lihue

M.H. Rodenhurst  
Supervisor  
Hawaiian Telephone Co., Lihue



APPENDIX E

PUBLIC MEETING

Public Meeting - March 11, 1976

The Environmental Quality Commission's Regulation 1:41 provides that interested parties be given the opportunity to review and comment on an environmental impact statement while it is in preparation, and that such comments and suggestions, and the responses thereto be incorporated into the final document. In compliance with this regulation, Moana Corporation noticed and held a public informational meeting to present its plans for the Kiahuna Golf Village and review the findings of independent experts studying the economic, social and environmental impacts of the proposed plan. The meeting was held on Thursday, March 11, 1976 at 7:30 p.m. at the Koloa Civic Center, Koloa, Kauai. A list of those persons who were mailed written notice of the meeting is appended to this section. This list includes governmental offices or officers involved in the planning/approval process, interested private citizens, local residents, and all parties who requested information on the project from Moana or its independent consultants. Notice of the meeting was also published in the Garden Island, Kauai's newspaper, and announced on the local radio station to give notice to as broad a segment of the public as possible.

At the meeting, Mr. Robert Harmon, President of Moana Corporation, presented his corporation's plans for the Kiahuna Golf Village project and distributed a brochure outlining those plans and summarizing the findings of the independent experts which are preparing the Kiahuna Golf Village Environmental Impact Statement. The full text of the brochure is set forth below, and a copy is enclosed with this EIS:

"KIAHUNA GOLF VILLAGE

A Summary of the Findings of Independent  
Experts Regarding the Economic, Social  
and Environmental Impacts of the Proposed  
Kiahuna Golf Village Plan

Moana Corporation is pleased to present its proposed plans for the Kiahuna Golf Village, along with a summary evaluation of the Village's physical, economic, aesthetic, social and environmental impacts. These impacts - which are crucial in considering whether a proposed project will benefit the larger community - are fully documented in a series of detailed technical studies. These studies are the basis for an "Environmental Impact Statement", a document being prepared by independent

consultants in compliance with the regulations of the Environmental Quality Commission of the State of Hawaii.

"We hope that this summary of our studies to date will help more people understand the proposed plan and will encourage the widest possible participation of Kauai Citizens in the review process. Your informed comments, criticisms and suggestions will help our consultants complete their studies and the Environmental Impact Statement, and ensure that the plan will provide the maximum benefits to the entire community.

#### Description of Kiahuna Golf Village

"Kiahuna Golf Village will be a residential and resort development on approximately 480 acres of land owned by the Knudsen Trusts mauka of Poipu Road in the Koloa-Poipu area. Its overall quality can best be described by reference to Moana's present Kiahuna resort. The Village will be an extension of Moana's demonstrated and widely commended concern for sensitive site planning that maintains open space and low densities, aesthetically pleasing and unobtrusive architecture, lush landscaping and durable construction. These principles of responsible development will be implemented to create a village that will include the following elements:

- Both residential and rental condominium units.
- Single-family homesites, priced to fill a substantial portion of Kauai's need for permanent local housing.
- Over 70% of the land maintained as recreational or landscaped open space.
- An overall density of less than three units per acre.
- Low rise, "missionary style" architecture in keeping with the character of the area, with no buildings exceeding three stories.
- An 18-hole, 7,000 yard championship golf course.
- A tennis club with up to twenty-four courts, swimming pools, changing rooms, pro shop, and dining terrace.

--Bicycle and pedestrian pathways throughout the site.

--An outdoor community theater for the performing arts.

--A convenience shopping area.

#### Public Benefits

"Moana Corporation's business objective, as is the case with every private enterprise, is to make a profit. However, the company's success has been directly related to a principle it has followed since it built its first condominium: A development project is sound in concept only if it will confer distinct and significant benefits on the larger community. Indeed, no major project should be approved unless it will create important benefits for the general public.

"The studies for the Environmental Impact Statement for the Kiahuna Golf Village identify a number of clear and significant economic, social, and aesthetic benefits which the project will create for the people of the Koloa-Poipu area and the County of Kauai. We should like you to consider them:

#### Recreational Opportunities

"State studies have determined that Kauai has a shortage of recreational facilities. The Village golf course, tennis courts, and other recreational facilities will be open to the public, affording permanent residents as well as visitors a much wider range of recreational opportunities.

#### Employment Opportunities

"Kauai has a high rate of structural unemployment, which is accompanied by high costs of public welfare that are associated with joblessness. Kiahuna Golf Village will provide significant employment opportunities for permanent Kauai residents since Moana Corporation's clear commitment is to avoid, where at all possible, the importation of labor. Under this policy, we estimate that the Village will have the following employment effects:

"During the 15-year build-out of the project, we estimate that the Village will create 105 new jobs annually, of which 93 can be filled by permanent residents.

"Average total annual wages for construction workers will be approximately \$1.3 million.

"Upon completion of the condominiums, it is estimated that the Village will provide at least 390 permanent jobs, of which 383 will be filled by permanent Kauai residents.

"The average annual permanent employment wage will be approximately \$3.6 million.

#### Local Business Opportunities

"Moana intends that the facilities in the Village's convenience shopping center will be operated as concessions by local Kauai businessmen. Since the center will serve principally the added population of the Village, business will not be diverted from existing shops. Rather, existing businessmen will have the opportunity to expand their economic opportunities by opening additional shops on the site.

#### Housing Opportunities for Permanent Kauai Residents

"Kauai has a serious shortage of quality housing for permanent residents. The Village plan is designed to provide quality permanent housing opportunities at prices which moderate income Kauai families can afford:

"The plan provides for 300 single-family lots.

"According to the EIS's housing market analysis, approximately 40% of Kauai households have purchasing ability sufficient to buy the Village lots priced for moderate income families.

#### Contribution to County Finances

"The County's costs of providing public services are rising faster than its tax revenues. If the trend continues, the County eventually would have only three alternatives - first, raise the taxes of present Kauai residents; second, cut public services; or, third, expand the tax base.

"The Village will have a clearly positive impact on the long-run economic stability of the County, contributing to the County's ability to maintain high quality public services through an expanded tax base. As will be documented in detail in the EIS, the new tax revenues which the Village will generate will far exceed the new costs which the County will incur in providing public services:

"Estimated net cumulative revenues to the County over the 20-year build-out period will be approximately \$12.4 million.

"Estimated cumulative revenues to the state will be approximately \$5.3 million. If the Village is not built, the revenues to the County from the property are estimated at \$453,000.

"After Village completion, Kauai County revenues are estimated to be \$1.2 million annually, and state revenues are estimated to be \$293,000 annually.

#### Land for Expansion of County Park

"As part of the overall plan for Kiahuna Golf Village, Moana Corporation is committed to dedicate 20 acres of property at no cost to the County for expansion of the existing Poipu Beach Park. In addition to the amenities within the Village which will be available to the public, the expanded County Park represents a specific benefit for the general public which will be brought about with the development of the Village.

#### Ideal Location

"The site of the proposed Kiahuna Golf Village is ideal for development of a residential/resort community which is in keeping with the character of the area:

"The site has no viable alternative uses. The land, which presently is covered with unsightly koa and weeds, has been classified by the Land Study Bureau as "E" - the Bureau's lowest land productivity rating. Inadequate topsoil with low nutrients and lack of water in the absence of irrigation have caused the failure of attempts to cultivate sugarcane. The land is not productive for agriculture.

"The Kiahuna Golf Village would change the aesthetically unattractive and economically unproductive site into a viable residential resort producing new beauty for the area, new jobs for Kauai residents, and new tax revenues for the County.

"Use of this land for these purposes will be consistent with existing County perceptions as to the ideal character of the area. Recognizing its unique assets-- a warm and sunny climate with prevailing mild breezes, splendid beaches, and many historic, cultural, and scenic places of interest--both the County and the State have designated the makai Poipu area as a principal resort residential area.

"The Village will replace the present inaccessible stand of scrub bushes, weeds, rocks, cow pastures, and barbed wire fences with a lush greenbelt of landscaping and golf course fairways extending along Poipu Road for almost the entire length of the project. Through the new, landscaped view corridors thus created, the Village will in fact increase the area's feeling of openness. The low-rise character of the homes, clustered to preserve open space, will maintain the Village's sense of openness and lightness.

#### Containment of Occupants in the Village

"Kiahuna Golf Village has been planned to minimize the impact of the projected growth in population it will cause. With its extensive recreational facilities, which will constitute the largest and highest quality recreational complex on Kauai, as well as its convenience center, the project will be largely self-contained, minimizing off-site travel and the impact of population and traffic on the Koloa-Poipu area. The traffic analysis prepared for the EIS concludes, based both on a survey of residents of the existing Kiahuna project and on studies of other developments comparable to the proposed Village, that such projects generate relatively little off-site travel compared to less comprehensively designed communities."

\* \* \*

Mr. Harmon stated that his corporation had chosen a public meeting as the best way to disseminate information about its proposed Kiahuna Golf Village project and to encourage the widest possible public participation in the review process. He said his company would welcome comment on the plans presented at the meeting, and the results of the many impact studies which have been completed, and that all such comments would be reviewed and replied to, with both comment and response incorporated into the final EIS to be submitted to the State and County.

Mr. Harmon introduced Messrs. James R. Bell, of Belt, Collins & Associates, the firm which is carrying out the studies/analyses of the environmental impact of the project, and Richard J. Smart, of McDonald & Smart, Inc., the consulting group which is preparing the studies/analyses of the economic and social impacts of the project. Both reviewed their findings and answered questions from the audience.

The audience numbered approximately 170 persons. Relatively few people asked questions or volunteered comments. Most comments were of a favorable nature, and generally supported the project. Several persons expressed concern and sought assurance that Moana Corporation would develop the Kiahuna Golf Village to the same standard of quality as the Corporation's existing Kiahuna project.

Other concerns which were expressed dealt with the following subjects:

Existing Sewage Treatment

Comment: A comment was made that recognized the high quality of the Kiahuna project, but questioned the desirability of placing the sewage treatment plant (STP) so close to the road and beach. It was felt that its present location was not desirable due to generated odors, and a question was raised as to whether or not Moana Corporation would expand the existing facility to accommodate the Kiahuan Golf Village development.

Response: Moana Corporation does intend to expand the existing STP to accommodate the Golf Village development. We recognize the odor problem of the existing facility, partially which is caused by the fact that the system is not presently completed. The lift stations which are being used in the interim to convey wastewater may be causing septic conditions. As the system is completed, the addition of hydrogen peroxide will be made to alleviate septic or odor causing conditions.

### Golf Course Fees

Comment: Will the golf course fees be competitive with other public courses on Kauai and elsewhere in Hawaii?

Response: The golf course will be open for public play, and it is Moana Corporation's intention that the fees will be in line with other public courses in resort settings. Detailed course design and specific fee arrangements have not been formulated at this time.

### Construction Noise and Dust Problems

Comment: Previous major construction in the Poipu area has generated considerable dust and noise problems. Has Moana Corporation considered the problems of noise and dust which will be associated with the construction of the Kiahuna Golf Village project?

Response: Moana Corporation does intend to take all practical measures to reduce and minimize dust and noise problems during the construction phase. The greatest potential problem with respect to dust will occur during the first two years of construction as the majority of the site preparation will begin and all recreational facilities including the golf course, the tennis complex will be constructed. To minimize dust problems, water and/or oil will be applied regularly to areas being graded or exposed and a band of the existing haole koa and other vegetation will be maintained around the perimeter of the project site during construction to act as a buffer for dust and sound.

With respect to noise, construction will generally progress from the southern part of the site near Poipu Road northward into the interior. There could be some noise disturbances to nearby developments during site preparation of the southern portions of the property, but it is believed that the retention of a band of haole koa to serve as a noise and buffer strip will alleviate construction noise disturbances.

Persons/Organizations to Whom Notice of Public Meeting Sent

County of Kauai  
Office of Economic Development  
4396 Rice Street  
Lihue, Kauai

County of Kauai  
Finance Department  
4396 Rice Street  
Lihue, Kauai

Mayor Eduardo Malapit  
County of Kauai  
4396 Rice Street  
Lihue, Kauai

Planning Department  
Attn: Brian Nishimoto  
County of Kauai  
4280 Rice Street  
Lihue, Kauai

County of Kauai  
Building Division  
3021 Umi Street  
Lihue, Kauai

County of Kauai  
Water Department  
4398 Pua Loke Street  
Lihue, Kauai

Senator George Toyofuku  
State Capitol  
Honolulu, Hawaii

Representative Tony Kunimura  
State Capitol  
Honolulu, Hawaii

Representative Dennis Yamada  
State Capitol  
Honolulu, Hawaii

Representative Richard Kawakami  
State Capitol  
Honolulu, Hawaii

Kauai Planning Commission  
Lihue, Kauai

State Department of Health  
Attn: Dr. Melton  
Lihue, Kauai

State Highways Division  
Attn: Edwin Nakano  
Lihue, Kauai

Councilman Abel Medeiros  
Koloa, Kauai

Councilman Burt Tsuchiya  
Kalaheo, Kauai

Councilman Jerome Hew  
Kapaa, Kauai

Councilman Roger Hee  
Kapaa, Kauai

Councilman Robert Yotsuda  
Lihue, Kauai

Councilwoman Rose Ono Shaw  
Kapaa, Kauai

Councilman Louis Gonsalves  
Kapaa, Kauai

Carey-Anne Moody  
Rural Route Number One  
Box 357  
Kapaa, Kauai

Eric Maehara  
Wooddell, Mukai & Ichiki  
Suite 800, 345 Queen Street  
Honolulu, Hawaii

Jennis Yukimura  
Rural Route Number One  
Box 28-B  
Lihue, Kauai

Francis G. Howarth  
Bernice P. Bishop Museum  
P.O. Box 6037  
Honolulu, Hawaii

Jiro Yukimura (Jennis, John  
Miles and David)  
Rural Route Number One  
Box 28-B  
Lihue, Kauai

John Pilkington  
P.O. Box 382  
Lihue, Kauai 96766

Lorna Omori  
P.O. Box 1525  
Lihue, Kauai

G. Henry  
P.O. Box 850  
Koloa, Kauai

Karen Fisher  
45-1107 Grote Road  
Kaneohe, Hawaii

Jo Soares  
Rural Route Number One  
Box 327  
Kapaa, Kauai

Keith Arakaki  
General Delivery  
Kapaa, Kauai

Gary Tasaka  
P.O. Box 92  
Koloa, Kauai

James W. Morrow  
Director - Environmental Health  
American Lung Association  
245 North Kukui Street  
Honolulu, Hawaii

Daivd D.H. Chang  
P.O. Box 726  
Koloa, Kauai

Tamara L. Wong  
Box 712  
Koloa, Kauai

Miriam P. Wong  
Box 712  
Koloa, Kauai

Larry A.C. Wong  
Box 712  
Koloa, Kauai

Paula L.C. Wong  
Box 712  
Koloa, Kauai

Laura Iwase  
P.O. Box 726  
Koloa, Kauai

Napua Wong  
Box 251  
Lawai, Hawaii

John G. Emery  
Box 251  
Lawai, Hawaii

Joanne Griep  
Box 500  
Rural Route Number One  
Koloa, Kauai

Marty Kuala  
Box 813  
Koloa, Kauai

Rosemary K. Lau  
Box 784  
Koloa, Kauai

Galen K. Kanapani  
Box 486  
Kalaheo, Hawaii

Fred Pannkoke  
Box 832  
Koloa, Kauai

Dean Almeida  
Koloa, Kauai

Gene Henry  
Box 850  
Koloa, Kauai

Max Graham  
Box 128  
Anahola, Kauai

Dr. Arnold Nurock  
Box 23  
Kilauea, Hawaii

Jeremy Harris  
Box 445  
Lihue, Kauai

Charles Forward, Jr.  
Hanalei, Hawaii

Jack Nishimoto  
Hanalei, Hawaii

Roy Yamakawa  
c/o Kauai Community College  
Lihue, Kauai

Joel Oyama  
c/o Katsuyoshi Oyama  
Kalaheo, Hawaii

Gloria McElgunn  
Keapana, Kauai

Cliff Hosai  
Kapaa, Kauai

Clayton Yoshida  
Kapaa, Kauai

Darryl Horner  
Lihue, Kauai

John Black  
Lawai, Kauai

Dr. & Mrs. Sears  
Rural Route Number One  
Box 214-D  
Kapaa, Kauai

Mrs. Jennis T. Yukimura  
Health Building  
Lihue, Kauai

Dr. & Eve Noll  
Box 427  
Waimea, Kauai

Terry Kaman  
WeliWeli, Poipu  
Kauai

Dr. Wayne & Lillian Gokan  
Lihue Shopping Center  
Room 219  
Lihue, Kauai

John Kaulukukui  
Kauai Canoe & Racing Assn. Paddlers  
Niualu, Hawaii

Bruce Sakimae  
Koloa, Kauai

George Cooper  
3620 Sierra Drive  
Honolulu, Hawaii

Pamela Ching  
c/o Wilcox Hospital  
Lihue, Kauai

Judy Souza  
c/o Clarence Souza  
Koloa, Kauai

Priscilla Basconcillo  
Wailua Houselots  
Wailua, Hawaii

Welerico Estrada, Jr.  
Hanamaulu, Kauai

Gordon Matsumura  
Box 726  
Koloa, Kauai

Patty Kaliher  
Department of Health  
Lihue, Kauai

Melvin Sanehira  
Lawai, Kauai

Donna Butler  
Lawai, Kauai

Dorothy Tao  
c/o Koloa School Library  
Koloa, Kauai

Bernard Almeida, Sr.  
Koloa, Kauai

Bernard Thompson, Esq.  
Weliweli Houselots  
Koloa, Kauai

Courtney Kahr, Esq.  
Lihue, Kauai

Marshall Reddish  
Rural Route Number One  
Box 110  
Koloa, Kauai

Mike Woods  
Omao, Kauai

Dr. Alice Larkins  
Wailua Homesteads  
Wailua, Hawaii

Martha Remito  
Wailua Homesteads  
Kauai

Trudy Soto  
Kalaheo, Kauai

Jean Bunyan  
c/o Kauai Community College  
Lihue, Kauai

Mr. & Mrs. Albert W. Duvel  
Poipu, Kauai

Mr. & Mrs. Robert A. Graham  
Lihue, Kauai

Mr./Mrs. Harvey Janson  
Poipu, Koloa, Kauai

Ted Kroeger  
Poipu, Kauai

Mary M. Jones  
Lihue, Kauai

Lois Hamblin  
Lihue, Kauai

Mary Lawrence  
Lihue, Kauai

Robert Hamblin  
Lihue, Kauai

J.P. Hofman, M.D.  
Poipu, Kauai

Henry Eaton  
Koloa, Kauai

Nancy Bahouth  
Koloa, Kauai

Marima Salvatore  
Lihue, Kauai

Maile Williams  
Lihue, Kauai

Sally P. Netz  
Wailua Homesteads  
Kauai

Edward D. Vickery  
Lihue, Kauai

Debbie Morton  
Wailua Homesteads  
Kapaa, Kauai

Jeanette Tachibana  
Kapaa, Kauai

Joycy Matsushima  
Hanalei, Kauai

S. Andrews  
Lihue, Kauai

Thomas Hines, Jr.  
2798 Upena Street  
Lihue, Kauai

Dolly Redongo  
Koloa, Kauai

Herbert T. Randall  
Koloa, Kauai

Eugene Sonnet  
Poipu, Kauai

William E. Sanborn  
Poipu, Kauai

Jacqueline Joons  
Poipu, Kauai

C.G. Mead, Jr.  
Box 288 I-21  
Kapaa, Kauai

Homer Hietton  
Box 217  
Anahola

Fred Hebert  
Box 368  
Lihue, Kauai

Bruce Adams  
Box 106  
Koloa, Kauai

Dorothy Mead  
Box 288 I-21  
Kapaa, Kauai

Frank Sullivan  
Box 1145  
Lihue, Kauai

Ruth Roesch  
Box 102-R  
Koloa, Kauai

Kay Reddish  
Box 110  
Koloa, Kauai

Walter B. Jouza  
Box 405  
Koloa, Kauai

Frances H. Dillon  
Poipu, Kauai

Kit White  
Barking Sands  
Kauai

E.A. Brown  
Kalaheo, Kauai

T.B. Desenberg  
Koloa, Kauai

K. Barker  
Kapaa, Kauai

Dorothy Loe  
Box 688  
Lihue, Kauai

T. Berry  
Waimea Clinic  
Waimea, Kauai

M. Ahana  
Lihue, Kauai

Alice Ishie  
Lihue, Kauai

Debby Heath  
Lihue, Kauai

Mabel Maruko  
Lihue, Kauai

Federico Ono  
Box 323  
Koloa, Kauai

Lou Yuasa  
Box 381  
Koloa, Kauai

Yoshiharu Nakamura  
2854 Pikake Street  
Lihue, Kauai

Y. Nakagawa  
Elele, Kauai

Wallace Maura  
Koloa, Kauai

J. Saks  
Koloa, Kauai

Goro Tasaka  
Koloa, Kauai

Patricia Shulon  
Koloa, Kauai

Phil Jameson  
Koloa, Kauai

C. Berkoski  
Lawai, Kauai

Kathryn Carter  
Koloa, Kauai

Mary P. Atcheson  
Box 426  
Lihue, Kauai

Virginia Ballie  
4568 Hoomana Road  
Lihue, Kauai

M. Morishige  
2878 Waa Road  
Lihue, Kauai

Nancy Goodale  
3429 Hinahina Street  
Lihue, Kauai

Yuku Isonaga  
Poipu Kauai

F. Vech  
Homesteads  
Rural Route Number One  
Kapaa, Kauai

Yukie Reed  
3022 Pua Nani  
Lihue, Kauai

APPENDIX F

PUBLIC REVIEW AND APPLICANT RESPONSE

Public Review and Applicant Response

Following the March 11, 1976 Public Meeting, the Environmental Quality Commission's Regulations call for a 30-day period in which the public can review and submit comments on the environmental impact statement. Following the 30-day review period, the applicant is required to respond in writing to comments received, and such responses must become a part of the EIS.

During the 30-day period, comments were received from the following agencies and organizations:

- U.S. Department of Agriculture - Soil Conservation Service
- Department of the Army - Engineering Division
- Department of the Army - Support Command (no comment)
- Department of Air Force (no comment)
- State of Hawaii - Office of Environmental Quality Control
- State of Hawaii - Department of Transportation (no comment)
- State of Hawaii - Department of Transportation - Highways Division (no comment)
- State of Hawaii - Department of Education
- State of Hawaii - Department of Health
- State of Hawaii - Department of Land & Natural Resources
- State of Hawaii - Department of Planning & Economic Development
- State of Hawaii - Department of Defense (no comment)
- State of Hawaii - Department of Agriculture (no comment)
- University of Hawaii - Environmental Center
- University of Hawaii - Water Resources Research Center
- Kauai County - Department of Public Works
- Kauai County - Fire Department
- Kauai County - Planning Department
- Kauai County - Office of Economic Development
- Kauai County - Water Department
- Kauai County - Department of Finance
- Kauai County - Office of Housing Administrator
- Kauai Electric
- American Lung Association of Hawaii
- Archaeological Research Center Hawaii
- Bernice P. Bishop Museum

Their comments, along with the responses thereto are reproduced in their entirety on the following pages. Responses related to social and economic aspects (Part I) of the EIS were prepared by McDonald & Smart, Inc. Those related to the physical aspects (Part II) were prepared by Belt, Collins and Associates.

RECEIVED

JUL 9 1976

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

BELT, COLLINS & ASSOCIATES, LTD.

440 Alexander Young Bldg., Honolulu, HI 96813

July 7, 1976

Planning Department  
County of Kauai  
4280 Rice Street  
Lihue, Kauai, HI 96766

Gentlemen:

Subject: An Analysis of the Economic, Social and Environmental  
Impacts of Kiahuna Golf Village, County of Kauai

We have reviewed the subject EIS and have the following comments:

1. Page 237-238. It appears that channels A and B will reduce flooding along the old Poipu Beach Road. The additional runoff added to Waikomo Stream by these two channels may cause concern in the lower reaches of this stream. What effect will the additional runoff have on the lower reaches of Waikomo Stream? Will it cause flooding?
2. Page 238. It mentions that studies by the U.S. Army Corps of Engineers state that the lower reaches of Waikomo Stream do not have the capacity for the 100-year frequency flood and that culverts at Poipu Road are inadequate. In the impact section, page 271, it states that enlargement of the existing culverts under Poipu Road have been recommended.

These two statements have not answered the question of who will enlarge the culverts and also improve the lower reaches of Waikomo Stream.

3. What impact will the development have on McBryde Sugar Company which farms the adjacent area?

Thank you for the opportunity to review this statement.

Very truly yours,

*Francis C. H. Lum*  
Francis C. H. Lum  
State Conservationist

cc: Belt, Collins, & Assoc.

- 343 -

Route to:	
<input checked="" type="checkbox"/> Bell, R. M.	<i>MB</i>
<input type="checkbox"/> Bell, J	
<input checked="" type="checkbox"/> Hirota, P.	
<input type="checkbox"/> Lyon, F. E.	
<input type="checkbox"/> Ng, W.	
<input checked="" type="checkbox"/> Vierra, J.	
<input type="checkbox"/> Waltrabenstein, P.	
<input type="checkbox"/> Cain, R.	
<input type="checkbox"/> Hastert, M.	
<input checked="" type="checkbox"/> Helber, I.	
Action by _____	
Description _____	
File. Job # _____	

LEH  
JRB

July 16, 1976

Mr. Francis C.H. Lum  
State Conservationist  
Soil Conservation Service  
U.S. Department of Agriculture  
440 Alexander Young Building  
Honolulu, Hawaii 96813

Dear Mr. Lum:

Kiahuna Golf Village

The following are responses to your comments made in a letter dated July 17, 1976, on the Kiahuna Golf Village Environmental Impact Statement.

1. Diversions channels "A" and "B" as proposed for the development implements a portion of the County's drainage general plan concept for the Koloa-Poipu region (General Plan - Water, Sewerage and Drainage; County of Kauai; by Sunn, Low, Tom and Hara; August, 1963). The primary purpose of the channels is to divert the sheet runoff from the lands between Koloa and Poipu that now ponds at the low lying areas along the old Poipu Road. The flood problems of the Poipu Beach area are well documented. Channels "A" and "B" will significantly reduce the amount of runoff reaching the flood prone areas. The diverted waters will be discharged into Waikomo Stream for eventual release into the sea.

The 50- and 100-year recurrence interval peak discharge rates of Channels "A" and "B" based on the County of Kauai Storm Drainage Standards are as follows:

Table 1: Channels "A" and "B" Discharges

Channel	Tributary Area	Peak Discharge Rate	
		50-Year	100-Year
"A"	345 acres	1,200 cfs	1,700 cfs
"A" w/extension	1,022 acres	3,400 cfs	4,700 cfs
"B"	165 acres	600 cfs	800 cfs

Waikomo Stream Hydraulics: The increase to the Waikomo basin area by Channels "A" and "B" is small, from 10.4 to 11.2 square miles. The effect on the Waikomo Stream peak discharge rates is even less significant.

The following table shows the actual increase to the Waikomo Stream peak discharge rates for storms of various frequencies based on the County's Storm Drainage Standards.

Table 2: Waikomo Stream Discharge

<u>Drainage Basin</u>	<u>Area (Square Miles)</u>	<u>Peak Discharge Rates</u>	
		<u>50-Year</u>	<u>100-Year</u>
Existing	10.4	13,000 cfs	20,800 cfs
With Channels "A" and "B"	11.2	13,600 cfs	21,600 cfs
With Channels "A", "B" and "A Extension"	12.0	14,200 cfs	22,800 cfs

The project proposes to construct Channels "A" and "B". The extension of Channel "A" is to be implemented as part of the County General Plan. The increase to the Waikomo Stream flow is 600 cfs or 4.6% for the 50-year storm and 800 cfs or 3.8% for the 100-year storm.

The U.S. Army Corps of Engineers and other government agencies have done several studies of the Waikomo River basin. The Corps of Engineers standard project flood discharge for the lower reaches of the stream is 26,400 cfs. Its 10-year, 50-year and 100-year frequency floods are 9,900; 15,700; and 18,200 cfs respectively. The Corps estimates the capacity of the two Waikomo Stream culverts at Poipu Road to be 7,000 cfs. This is less than the 10-year frequency flood of 9,900 cfs. Therefore, any unusual storm may cause the overtopping of the stream banks and flooding of adjacent lands to occur.

The Flood Insurance Study, Type 15: Koloa-Poipu Vicinity, Kauai, Hawaii, by R.M. Towill for the Federal Insurance Administration, defines the Waikomo Stream water profile and inundation limits for the 100-year frequency flood. The criteria used in the study is based largely on the Corps of Engineers data and discharge rates. The attached Plate 13 from the report shows the flood water surface profile for the 10-year, 100-year and the standard project floods. The difference between the standard project flood (Q = 26,400 cfs) and the 100-year flood (Q = 18,200 cfs) is about one foot. Therefore, using the 800 cfs increase (100-year flow, Table 1) to Waikomo Stream by Channels "A" and "B" for a generalized comparison, the increase to the flood level should be less than a quarter foot, depending upon variations in the stream cross-sectional areas and floodway widths. Plotting of several cross-sections verified this.

The R.M. Towill study assumes that the fringe area between the floodway where actual flow movement occurs and the outer flood water limits

Mr. Francis C.H. Lum

- 3 -

July 16, 1976

have no storage capacity or flow. This is a conservative assumption. Therefore, the effects of Channels "A" and "B" on Waikomo Stream in relation to the limits shown in the R.M. Towill study should be negligible.

In conclusion, the existing Waikomo Stream cross-sectional area and culvert/bridge crossings are inadequate for design discharges established by the County and Corps of Engineers. Channels "A" and "B" will divert additional runoff to the Waikomo Stream floodway; however, review of the R.M. Towill study shows that the effect should be negligible.

Channels "A" and "B" will be a definite benefit to the now flood prone areas along Poipu Beach Road.

2. From the above analysis, Moana Corporation feels that the impact of increased flow in Waikomo Stream due to the diversion of rainfall runoff will be minimal. The culvert structures at Poipu Road are presently inadequate and should be enlarged; however, under what government agency this fiscal responsibility lies is not known.

3. The impact to the McBryde Sugar Company land will also be minimal. The portion of the development which borders the sugar company land will be in golf course and will act as a buffer between the building structures and the cane fields.

We hope that your comments have been adequately addressed.

Sincerely yours,

  
Joseph Vierra, Jr.

JV:kko

encs.

cc: Brian Nishimoto  
Robert Harmon



DEPARTMENT OF THE ARMY  
 U. S. ARMY ENGINEER DISTRICT, HONOLULU  
 BLDG. 230, FT. SHAFTER  
 APO SAN FRANCISCO 96558

RECEIVED

JUL 9 1976

BELT, COLLINS & ASSOCIATES, LTD.

8 July 1976

Route to:	
<input checked="" type="checkbox"/> Belt, R. M.	
<input checked="" type="checkbox"/> Hirota, P.	
<input type="checkbox"/> Lyon, F. E.	
<input type="checkbox"/> Ng, W.	
<input checked="" type="checkbox"/> Vierra, J.	
<input type="checkbox"/> Wollrabenstein, P.	
<input type="checkbox"/> Cain, R.	
<input type="checkbox"/> Hastert, M.	
<input checked="" type="checkbox"/> Helber, L.	
Action by _____	
Description _____	
File # _____	

Planning Department  
 County of Kauai  
 4280 Rice Street  
 Lihue, Kauai 96768

Gentlemen:

We received the report "An Analysis of the Economic, Social, and Environmental Impacts of Kiahuna Golf Village" on 6 June 1976 and offer the following comments.

- a. Because Waikomo Stream passes through the development, any earth-moving activities along the stream banks or realignment of the stream may require a Department of the Army permit under Section 404 of the Federal Water Pollution Control Act Amendments of 1972.
- b. In addition to the comments on pages 238-239, the report should further investigate and address the increased flood hazards of downstream areas of Waikomo Stream resulting from including both within and outside the project area the proposed diversion channels.
- c. On pages 12, 223, and 233 are statements that sewage effluent is proposed to be used for golf course irrigation, yet the discussion of effects of irrigation on the golf course and ground water on pages 216-225 does not address the use of effluent for this use. Your attention is directed toward new Federal water quality standards for land treatment sewage disposal systems (U.S. Environmental Protection Agency Supplement on Alternative Waste Management Techniques for Best Practicable Waste Treatment, Federal Register, Vol. 41, No. 29, 11 February 1976). Although there are no Federal or State of Hawaii standards for buffer zones to protect against wind-transported pathogenic aerosols from spray irrigators of effluent, various studies exist on this matter.
- d. The report should address measures that will be taken to prevent sheet erosion and storm water runoff during grading and construction.



PODED-P  
Planning Dept, County of Kauai

8 July 1976

e. The report should also address the question of volume of and contaminants in storm water runoff from paved and other urban surfaces. Will there be an adverse effect on the Class AA quality standard of the adjacent coastal waters?

f. Considering the affluent segment of the population to which the project is oriented, it is reasonable to suppose that there will be an additional adverse effect on total demand for boat moorages over and above that reported in the State Comprehensive Outdoor Recreation Plan in Tables IV-22 and IV-23. This should present greater pressure for development of a small boat harbor at Kukuiula.

Thank you for the opportunity to present comments.

Sincerely yours,

KISUK CHEUNG  
Chief, Engineering Division

Copy furnished:  
Belt, Collins, & Assoc  
745 Fort Street, Suite 514  
Honolulu, HI 96813

Environmental Quality Commission  
550 Halekauwila St., Rm. 301  
Honolulu, Hawaii 96813

LEH  
JRB

July 16, 1976

Mr. Kisuk Cheung, Chief  
Engineering Division  
Department of the Army  
U.S. Army Engineer District, Honolulu  
Bldg. 230, Ft. Shafter  
APO San Francisco 96558

Dear Mr. Cheung:

Kiahuna Golf Village

This letter is written in response to your comments of July 8, 1976, pertaining to the Kiahuna Golf Village Environmental Impact Statement.

1. All statutes and laws (including a Department of the Army permit under Section 404 of the FWPCA Amendments of 1972) with regards to earth-moving activities along Waikomo Stream will be abided by.

2. Diversions channels "A" and "B" as proposed for the development implements a portion of the County's drainage general plan concept for the Koloa-Poipu region (General Plan - Water, Sewerage and Drainage; County of Kauai; by Sunn, Low, Tom and Hara; August, 1963). The primary purpose of the channels is to divert the sheet runoff from the lands between Koloa and Poipu that now ponds at the low lying areas along the old Poipu Road. The flood problems of the Poipu Beach area are well documented. Channels "A" and "B" will significantly reduce the amount of runoff reaching the flood prone areas. The diverted waters will be discharged into Waikomo Stream for eventual release into the sea.

The 50- and 100-year recurrence interval peak discharge rates of Channels "A" and "B" based on the County of Kauai Storm Drainage Standards are as follows:

Table 1: Channels "A" and "B" Discharges

Channel	Tributary Area	Peak Discharge Rate	
		50-Year	100-Year
"A"	345 acres	1,200 cfs	1,700 cfs
"A" w/extension	1,022 acres	3,400 cfs	4,700 cfs
"B"	165 acres	600 cfs	800 cfs

July 16, 1976

Waikomo Stream Hydraulics: The increase to the Waikomo basin area by Channels "A" and "B" is small, from 10.4 to 11.2 square miles. The effect on the Waikomo Stream peak discharge rates is even less significant. The following table shows the actual increase to the Waikomo Stream peak discharge rates for storms of various frequencies based on the County's Storm Drainage Standards.

Table 2: Waikomo Stream Discharge

<u>Drainage Basin</u>	<u>Area (Square Miles)</u>	<u>Peak Discharge Rates</u>	
		<u>50-Year</u>	<u>100-Year</u>
Existing	10.4	13,000 cfs	20,800 cfs
With Channels "A" and "B"	11.2	13,600 cfs	21,600 cfs
With Channels "A", "B" and "A Extension"	12.0	14,200 cfs	22,800 cfs

The project proposes to construct Channels "A" and "B". The extension of Channel "A" is to be implemented as part of the County General Plan. The increase to the Waikomo Stream flow is 600 cfs or 4.6% for the 50-year storm and 800 cfs or 3.8% for the 100-year storm.

The U.S. Army Corps of Engineers and other government agencies have done several studies of the Waikomo River basin. The Corps of Engineers standard project flood discharge for the lower reaches of the stream is 26,400 cfs. Its 10-year, 50-year and 100-year frequency floods are 9,900; 15,700; and 18,200 cfs respectively. The Corps estimates the capacity of the two Waikomo Stream culverts at Poipu Road to be 7,000 cfs. This is less than the 10-year frequency flood of 9,900 cfs. Therefore, any unusual storm may cause the overtopping of the stream banks and flooding of adjacent lands to occur.

The Flood Insurance Study, Type 15: Koloa-Poipu Vicinity, Kauai, Hawaii, by R.M. Towill for the Federal Insurance Administration, defines the Waikomo Stream water profile and inundation limits for the 100-year frequency flood. The criteria used in the study is based largely on the Corps of Engineers data and discharge rates. The attached Plate 13 from the report shows the flood water surface profile for the 10-year, 100-year and the standard project floods. The difference between the standard project flood (Q = 26,400 cfs) and the 100-year flood (Q = 18,200 cfs) is about one foot. Therefore, using the 800 cfs increase (100-year flow, Table 1) to Waikomo Stream by Channels "A" and "B" for a generalized comparison, the increase to the flood level should be less than a quarter foot, depending upon variations in the stream cross-sectional areas and floodway widths. Plotting of several cross-sections verified this.

July 16, 1976

The R.M. Towill study assumes that the fringe area between the floodway where actual flow movement occurs and the outer flood water limits have no storage capacity or flow. This is a conservative assumption. Therefore, the effects of Channels "A" and "B" on Waikomo Stream in relation to the limits shown in the R.M. Towill study should be negligible.

In conclusion, the existing Waikomo Stream cross-sectional area and culvert/bridge crossings are inadequate for design discharges established by the County and Corps of Engineers. Channels "A" and "B" will divert additional runoff to the Waikomo Stream floodway; however, review of the R.M. Towill study shows that the effect should be negligible.

Channels "A" and "B" will be a definite benefit to the now flood prone areas along Poipu Beach Road.

3. Presently the effluent used to irrigate the grazing land comes from the tertiary package treatment plant. The groundwater at the site is brackish, and cannot be used as a groundwater source. Therefore, future effluent from the proposed secondary treatment plant will be within the criteria set forth in Chapter II, "Criteria for Best Practicable Waste Treatment".

4. All grading and construction will be in compliance with the Kauai County Grading Ordinance No. 262, "An Ordinance Regulating and Controlling Grading, Grubbing, Stockpiling, and Soil Erosion and Sedimentation Within the County of Kauai", which was adopted July 1, 1975.

5. An analysis of surface runoff due to storm water and its effects was done for the University of Hawaii - Water Resources Research Center. In short, based on an assumed mixing zone, current flux, and nutrient runoff, it was shown that the increase in nearshore nitrogen on the average for the "worst" month (January) was about .0055 mg/l. The concentration of nitrogen is primarily dependent upon the nitrogen levels existing in the ocean.

6. The increase of boat owners and the need for additional boat mooring at the present time is highly speculative. This demand shall be met as it arises.

We hope we have adequately responded to your comments.

Sincerely yours,

  
Joseph Vierra, Jr.

JV:kko  
encs.

cc: Brian Nishimoto  
Robert Harmon



DEPARTMENT OF THE ARMY  
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII  
APO SAN FRANCISCO 96558

AFZV-FE-EE

Director  
Planning Department  
County of Kauai  
4280 Rice Street  
Lihue, Kauai 96766



28 JUN 1976

NOTED:  
[Handwritten initials]

Gentlemen:

Reference is made to the document, An Analysis of the Economic, Social and Environmental Impacts of Kiahuna Golf Village.

We have reviewed the document and have no comments to offer.

Thank you for the opportunity to review this document.

Sincerely yours,

*Carl P. Rodolph*

CARL P. RODOLPH  
Colonel, CE  
Director of Facilities Engineering

CF:  
Ofc of Envir Quality Control  
Belt, Collins & Associates



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS, U.S. AIR FORCE (DAAF)  
APO SAN FRANCISCO 96363

REF ID: A66666  
TO: DEEE (Mr H Nakashima, 4492153)

28 JUN 1976

SUBJECT: Environmental Impact Statements

TO: Environmental Quality Commission  
550 Halekauwila Street, Room 301  
Honolulu, Hawaii 96813

1. This Headquarters has no comment to render relative to the following Environmental Impact Statements:
  - a. Final Environmental Impact Statement for Kiahuna Golf Village, Poipu, Kauai.
  - b. Draft Environmental Impact Statement for Honolulu Harbor, Oahu, Hawaii.
2. We greatly appreciate your cooperative efforts in keeping the Air Force apprised of your development projects throughout the State and the opportunity to review the statements.

  
HENRY V. SNIDER, Colonel, USAF  
Director of Civil Engineering



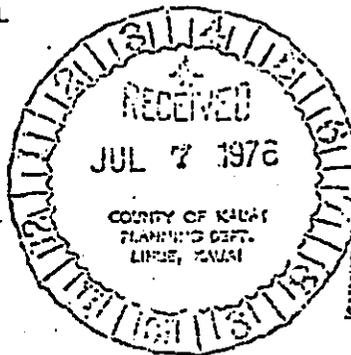
GEORGE R. ARIYOSHI  
GOVERNOR



RICHARD E. MARLAND, PH.D.  
DIRECTOR

TELEPHONE NO  
548-6915

STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL  
OFFICE OF THE GOVERNOR  
550 HALEKAUWILA ST  
ROOM 301  
HONOLULU, HAWAII 96813  
July 6, 1976



NOTED:
<i>[Signature]</i>

Brian Nishimoto, Director  
Planning Department  
County of Kauai  
4280 Rice Street  
Lihue, Kauai 96766

SUBJECT: Environmental Impact Statement for Kiahuna Golf Village  
Poipu, Kauai, Hawaii

Dear Mr. Nishimoto,

As of this date, this Office has received four comments on the above subject. An attached sheet lists the responding agencies.

In our review of the statement, we have found several areas in which the EIS should expand discussion. However, before we proceed, we have two major comments. First, the adequacy of an environmental impact statement is not judged on the amount of information being presented but it is the quality of information that is well substantiated and documented leading to logical conclusions. "padding" the EIS with self-serving justifications and rationalizations should not influence the decision of whether the document is acceptable or not. As stated in Sub-part E section 1;40 of the EIS Regulations, "An EIS...should not be merely a self-serving recitation of benefits and a rationalization of the proposed action." It shall at a minimum involve "identifying environmental concerns, obtaining various relevant data, conducting necessary studies, receiving public and agency input, evaluating alternatives, and proposing measures for minimizing adverse impacts."

Secondly, in lieu of distributing EIS Preparation Notices to all those requesting it, the consultants, Belt Collins and Associates, said that a public informational meeting would be held. However, the EIS does not contain any minutes nor responses to the questions and concerns discussed at that meeting. One of the purposes for the consultation period that was established by the Environmental Quality Commission was to allow wide public participation with documentation that the consultation period occurred. Without the inclusion of minutes

and questions and answers of the informational meeting, the EIS is inconsistent with sections 1:41 and 1:42 m. of the EIS Regulations. We strongly recommend documentation of this meeting. Further, a summary of the unresolved issues and either a discussion of how such issues will be resolved prior to the commencement of the action or stating overriding reasons for proceeding with such problems is strongly recommended to be included.

Specifically, we offer the following comments:

#### COMMERCIAL COMPLEX

How many stores will the 50,000 square feet complex accommodate?

#### SOCIAL IMPACTS

On page 23, the EIS states, "...the population growth, and the distribution of that growth, will occur in a fashion which avoids the adverse social impacts often associated with urbanization." What is basis for this conclusion?

#### LOT BUYERS

On page 55, the EIS indicates that approximately 25-30 per cent of the lots would be sold to Kauai residents while the rest would be sold to other Hawaiian and mainland residents. Yet, pages 16 and 17 imply that the project will "meet a substantial portion of the presently unfilled demand for permanent housing for Kauai residents." We recommend a discussion in order to clarify the discrepancy.

#### SEWERAGE TREATMENT

The EIS states on page 112, "A comprehensive discussion of sewerage treatment, as it relates to the Moana project will be forthcoming in an infrastructure plan currently under preparation by Belt, Collins and Associates, Ltd. of Honolulu." However, it should be noted that the entire action be considered. As stated in section 1:22 of the EIS Regulations,

A group of proposed action shall be treated as a single action when: (1) the component actions are phases or increments of a larger total undertaking; (2) an individual project is necessary precedent for a larger project; (3) an individual project represents a commitment to a larger project; or (4) the actions in question are essentially identical and a single Statement will adequately address the impacts of each individual action and those of the group of actions as a whole.

Thus, at minimum, there should be discussion of this infrastructure plan and how it relates to sewerage treatment.

### INFRASTRUCTURE PLAN

The statement on page 118, "A comprehensive description of the impacts of the Moana Project on the Koloa-Poipu infrastructure currently being prepared by Belt, Collins and Associates Ltd. of Honolulu, " is inconsistent with the EIS Regulations. As stated in the above paragraph, the infrastructure plan should be treated as a single action rather than a group of actions.

### CORRECTION (p. 197)

"Pacific golden plover" is the correct spelling.

### LAND USE PLANS AND POLICIES

Although the EIS relates the proposed action to the county general plan, it should also discuss its past history with the State Land Use Commission. Previously, this particular area failed to be rezoned by the Land Use Commission during the five year boundary review. In order for the EIS to be a full disclosure document, our Office feels that this information should be discussed.

### DRAINAGE

The discussion in this section is inadequate. The document mentions channels A and B. However, the type of channel is not given. Will they be concrete-lined or grass-lined? What impacts will surface run-off have on Waikomo Stream? Is Waikomo Stream perennial? If so, will aquatic life be affected? How will it be affected?

In addition, the statement should discuss the adverse impacts of channelization. For example, with concrete-lined channels, there is a faster run-off velocity resulting in little settling of debris. This increases sedimentation and siltation elsewhere. In this particular case, sedimentation may occur in the stream and eventually at the stream's outlet, namely the ocean. Also with channelization, there is less water percolation to the ground water table which leads to increased erosion problems, sedimentation, and siltation.

In essence, these topics should be considered and discussed in the EIS.

### TRAFFIC

How does the traffic projection relate to the total Poipu area in the future?

ALTERNATIVES

Although the EIS discusses the alternatives of no action and amending the county general plan in various stages, there are other considerations. Alternatives such as alternate sites, different designs, a park, and a botanical garden should also be given some discussion.

SHORT-TERM USES VS. LONG-TERM PRODUCTIVITY

A discussion of the impact of this proposed action toward the future should be included. In other words, will this project initiate further development within the area such as increased commercialization and further urban sprawl?

Also, the project will stimulate population growth, increase pollution, traffic, public facilities and utilities, and alter existing lifestyle in the future. Thus, these secondary impacts should be discussed.

LIST OF APPROVALS

A content requirement of the EIS Regulations is to include a list of necessary approvals for the proposed action and the status of each approval. (See section 1:42 of the EIS Regulations.)

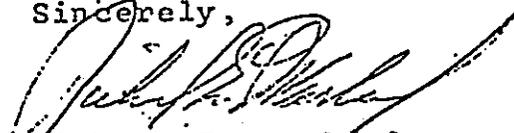
RECOMMENDATIONS

During your evaluation of the acceptability of the EIS, we recommend that Sub-part H, section 1:71 of the EIS Regulations serve as your guideline.

For brevity and fairness, our Office did not attempt to summarize other commentors. Instead, we recommend that careful consideration be given to each comment.

We trust that these comments are helpful to you. We thank you for the opportunity to review this statement. We look forward to the revised EIS.

Sincerely,



Richard E. Marland  
Director

Attachments

cc: Belt, Collins and Associates  
(w/attachments)

Richard J. Smart  
1845 Leavenworth Street  
San Francisco, California 94109  
(415) 771-6200

July 19, 1976

Dr. Richard E. Marland, Director  
Office of Environmental Quality Control  
Office of the Governor  
550 Halekauwila Street  
Honolulu, Hawaii 96813



DATE:

Subject: Environmental Impact Statement for Kiahuna Golf Village  
Eolpu, Kauai, Hawaii

Dear Dr. Marland:

I have been asked by Moana Corporation to respond to your letter of comments of July 6, 1976 relating to the above-referenced Environmental Impact Statement. I was responsible for the portion of the EIS relating to economic and social impacts. Accordingly, I will limit my responses to those areas.

Before addressing your specific comments, I should like to respond to one of the two "major" comments included at the beginning of your letter:

"First, the adequacy of an environmental impact statement is not judged on the amount of information being presented but it is the quality of information that is well substantiated and documented leading to logical conclusions. "Padding" the EIS with self-serving justifications and rationalizations should not influence the decision of whether the document is acceptable or not. As stated in Sub-part E section 1:40 of the EIS Regulations, 'An EIS... should not be merely a self-serving recitation of benefits and a rationalization of the proposed action.'"

I am not certain whether the comment was simply an informational reference to criteria for EIS's in general, or whether it was intended as a specific reference to the content of this particular EIS. If the latter, I do not believe that, insofar as the economics section is concerned, the document contains "padding" or "self-serving justifications," or that, simply because of the unusually large amount of information presented, some of it may be qualitatively deficient.

If there is a misunderstanding as to what is relevant or "quality" material, it may stem from the fact that a large amount of the material in this EIS deals with economic and social impacts, as distinct from EIS's which have been largely limited to strictly environmental concerns. The developer was explicitly required by the County of

Dr. Richard E. Marland  
July 19, 1976  
Page Two

Kauai to conduct an economic and social impact analysis. Pursuant to that requirement, the County gave the developer a lengthy list of areas of analysis relating to such subjects as job development, economic growth, local housing and tourism markets, public costs associated with the development, tax benefits which would accrue to the County from the development, etc. Every component of our study was directly responsive to the County's requests. In our judgment, the materials included in the report are integral and necessary parts of a professionally responsible economic analysis.

Regarding the comments relating to self-serving statements and recitation of benefits, I would note that this kind of study is meaningless without a "bottom line" assessment of costs and benefits, and it is difficult (as well as not very helpful) to present such an assessment without some qualitative synthesis, analysis, and summary of objectively developed data.

The fact is that some projects are "better" and some are "worse" as measured against given criteria of public benefit. People may differ as to what is and what is not a benefit; but the County clearly identified what it considered to be the categories of economic and social benefit against which the project was to be measured, and our study assessed the various impacts entirely within those given parameters. I do not believe there are qualitative characterizations in the economic and social impact sections of the report which are not supportable by the data.

The following responses are to those of your specific comments which relate to the portion of the study for which we were responsible:

#### Social Impacts

Comment: "On page 23, the EIS states, '...the population growth, and the distribution of that growth, will occur in a fashion which avoids the adverse social impacts often associated with urbanization.' What is the basis for this conclusion?"

The report identified some of the adverse impacts of urbanization as congestion and overcrowding, elimination of open space, construction and concentration of massive structures which destroy a people's sense of place and space, and urban sprawl.

The proposed project avoids congestion and overcrowding and preserves open space through its relatively low gross density per acre, the clustering of units, and the construction of an eighteen hole golf course. In addition, the low rise construction of the units, their location away from highways, and the landscaping of the project

Dr. Richard E. Marland

July 19, 1976

Page Three

adjacent to Poipu Road will combine to prevent visual intrusion of the development upon the community at large, an intrusion which usually occurs in an area with increased urbanization.

The project alleviates the trend toward urban sprawl by providing a housing alternative to lot and block development through the clustering of units in an area which has low visual impact upon the community at large.

Finally, population growth is distributed about equally over a development period of fifteen to twenty years. Consequently, the problems of assimilation which can occur when developments are not phased and large new populations suddenly appear in an area in a short period of time should be minimized.

#### Lot Buyers

Comment: "On page 55, the EIS indicates that approximately 25-30 percent of the lots would be sold to Kauai residents while the rest would be sold to other Hawaiian and mainland residents. Yet, pages 16 and 17 imply that the project will 'meet a substantial portion of the presently unfilled demand for permanent housing for Kauai residents.' "

Several readers of the EIS have noted this purported discrepancy. If 30% of the lots are sold to Kauai residents that would be 90 lots. Whether that number of lots justifies use of the term "substantial" is a matter of subjective opinion. During the five year period of 1970-74, 1,994 new housing permits were issued on Kauai for single family units. While lot sales data and construction permits are not directly comparable, this is the best data comparison we are able to make. However, the comparison is useful at an order-of-magnitude level because of the assumption that most Kauai residents who buy lots in the proposed development — as distinct from non-Kauai buyers — would be motivated to build a home fairly soon. If one accepts the relevance (although not the direct comparability) of the data, 90 projected lots sales are approximately 4.5% of the five year figure for issuance of building permits. I would consider that magnitude of addition to the local housing market to be "substantial."

Moreover, the 25-30% estimate of lots that would be purchased by Kauai residents was not a limitation. Theoretically, the entire inventory of 300 lots is available for purchase by Kauai residents. The percentage was an estimate, based on our market analysis, of the numbers of Kauai residents which the developer could expect to buy lots considering the estimated lot prices and a reasonably anticipated share of the total market. The actual number of local purchasers could be higher than estimated or lower.

Dr. Richard E. Marland  
July 19, 1976  
Page Four

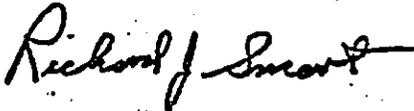
Although the preliminary development schedule shows 20 lots per year being put on the market for 15 years, the developer has indicated that, if there is a demonstration of a strong local market for the lower priced lots, and the county approves, the schedule could be accelerated in respect to such lots. However one feels subjectively about whether or not the proposed number of lots represents a "substantial" contribution to the local housing market, two things are clear:

1. The economic viability of the project and hence the estimated economic benefits to the county depend upon its being developed and marketed primarily as a destination resort with an appropriate price structure.
2. Within the constraints of that concept, the developer has estimated extraordinarily low prices for the lowest priced lots relative to the price structure of the project as a whole in order to make a contribution to local housing. From our analysis of the market on Kauai, it is clear that (a) the estimated prices for the lowest priced lots are well below the market, and (b) the number of such lots to be developed as a percent of the total project is unusually high.

---

Thank you for your comments. I hope these responses have been useful. If you need more information, please let me know.

Yours very truly,



Richard J. Smart

cc: Mr. Brian Nishimoto  
Belt, Collins and Associates, Ltd.

July 21, 1976

Mr. Richard E. Marland, Director  
Office of Environmental Quality Control  
State of Hawaii  
550 Halekauwila Street, Room 301  
Honolulu, Hawaii 96813

Dear Mr. Marland:

Kiahuna Golf Village

This letter is in response to your comments made in your July 6 letter to Brian Nishimoto, Director, Kauai County Planning Department, which pertain to "Part II - The Physical Impact of Kiahuna Golf Village" of the Kiahuna Golf Village Environmental Impact Statement.

Our response to your specific comments are set forth in Attachment 1 to this letter. In addition, we acknowledge your two major concerns and offer the following comments:

EIS Content

Your concern as to the quality and substance of information presented in the EIS is noted. We recognize that there invariably have been certain aspects which initially were not covered in the EIS to the greatest extent possible. In this regard, we have carefully reviewed your comments, as well as the comments of some 20 other responding agencies and individuals, and have made additional investigations and studies as necessary to meet the requirements of sub-part E Section 1:40 of the EIS Regulations. This additional information will be included as an addendum to the EIS.

Minutes of Public Meeting

Your comments concerning the minutes to the public informational meeting are well taken, and the minutes of the meeting will be included as an appendix to the EIS. Although the general tone of audience comments and reactions during the meeting was generally in support of the project, and few issues of an adverse nature were raised, we will include as a part of the EIS, a summarization of the basic issues raised in the past by special interest groups and those mitigating actions to be taken by Moana Corporation where possible.

Mr. Richard E. Marland  
July 21, 1976  
Page Two

Should you have any questions regarding the attached responses or desire further information, please do not hesitate to contact me.

Sincerely yours,

Larry E. Helber

LEH:kko

attachments

cc: Brian Nishimoto w/encs.  
Robert Harmon w/encs.  
Mike Vance w/encs.

Attachment 1

Response to comments on "Part II - The Physical Impact of Kiahuna Golf Village" of the Kiahuna Golf Village Environmental Impact Statement.

SEWAGE TREATMENT

The infrastructure plan is related to the sewage treatment plant in that it shows the internal piping network necessary to convey project generated sewage to the sewage treatment plant. The proposed new sewage treatment facility will be located at the site of the existing package plant. The infrastructure plan provides the basic skeleton to which future homes can be connected.

INFRASTRUCTURE PLAN

The statement on page 118 was misleading in that it was meant to imply expansion of the plan shown on page 234, Figure 7, at sometime in the future as the actual site plan is refined. We did not intend for this statement to be construed as an omission from the EIS, and possibly it would have been better not to have included the statement, as it has no bearing on the General Plan Amendment request.

CORRECTION (pg. 197)

The correction of the spelling of "plover" on page 197 is acknowledged.

LAND USE PLANS AND POLICIES

An application for land use reclassification from agriculture to urban for portions of the proposed 480+ acre Kiahuna Golf Village at Poipu, Kauai, was submitted by Moana Corporation to the State Land Use Commission in August of 1974 as part of the five year boundary review. In October 1974, the project came before the Commission, and two days of public hearings were held. Of the nine members of the Commission, only seven members heard the testimony and voted on the application. The vote was 4 to 3 in favor of the project, however, it did not pass, because a 2/3 majority was not obtained.

The Moana Corporation plans to file another land use reclassification application, with the State Land Use Commission sometime in August of 1976, after the acceptance of the project's environmental impact statement.

## LIST OF APPROVALS

The following is a list of approvals and approving agencies for the proposed action.

<u>Approval</u>	<u>Approving Agency</u>
State Land Use Reclassification (urban)	State Land Use Commission
General Plan Amendment	County of Kauai - County Council
Rezoning Application	County of Kauai - County Council
Zoning Permit	County of Kauai - Planning Commission
Building Permit	County of Kauai - Planning Department
	County of Kauai - Dept. of Public Works
	State - Dept. of Health
	County of Kauai - Dept. of Public Works
Grading Permit	
Special Management Area Use Permit (for 3.2 ac makai of Poipu Road)	County of Kauai - Planning Commission
Zoning Permit	County of Kauai - Planning Commission
Building Permit	County of Kauai - Planning Department
	County of Kauai - Dept. of Public Works
	State - Dept. of Health
For possible stream alteration (if necessary)	U.S. Army Corps of Engineers (under Section 404 of the Federal Water Pollution Control Act Amendments of 1972)

## DRAINAGE

In the EIS, we attempted to show that the effects of the proposed channels would be minimal. We will expand our discussion to answer your concerns.

1. Type of Channel: This has not yet been determined, although, space permitting, a grass-lined channel would be more economical. We would expect that the golf course area swale would be grassed and the areas of roadway would be a piped system. Other areas would depend on the project configuration. It is conceivable that Channel "B" would be entirely grass-lined.

2. Impact on Waikomo Stream: As outlined in the EIS, we feel that there will be minimal impact from surface run-off on Waikomo Stream.

3. Type of Stream: Waikomo Stream is not a perennial stream in this area. Further, there is no stream gage along its course.

4. Channelization: In our estimation, because of the level topography of the area and the probability of very flat channel shapes which will result in generally slow velocities, we feel that channelization is an improvement over the existing drainage pattern. This is further substantiated by the following:

- Clearing, grubbing and subsequent development of a golf course and landscaping for the other project areas will actually result in less siltation, debris and particulate sedimentation than now occurs; this will happen regardless of whether the channels are constructed or not.
- The channels actually serve to alleviate the present undesirable downstream condition where ponding occurs throughout the low-lying coastal resort complexes.
- While siltation, etc. are decreased, channelization causes increased water velocities and concentrates the flow at the outlet of the channel. Design configurations can alleviate scouring and other problems but an increased point concentration is inevitable. We have included as Attachment 2 a response made to another agency that attempts to show that while we are diverting and concentrating flow, its overall impact, considering the entire drainage basin, is minimal.
- Groundwater percolation may decrease, however, because permeability of the existing soil is moderate, this is not expected to be a major impact. New imported soil as well as increased vegetation will probably improve water which will minimize the erosion potential.

#### TRAFFIC

Assuming that the present traffic situation, projected from 1972 figures is relatively stable, it can be expected that the existing peak hour volume (between 4 and 6 p.m.) is about 637 vehicles per hour. Twenty years from now, vehicle traffic volumes will probably be greater than at present, however, a precise percentage increase is not known. The following is a tabulation of increased traffic due to the project and a tentative percentage increase over the base year. Note that these percentages in actuality will probably be lower, because peak hour traffic was assumed to be constant for the projected years. To ascertain future peak hour counts is highly speculative.

#### PROJECTED TRAFFIC IMPACT AT PEAK HOUR

Year	Existing Peak Traffic	Case 1: Project w/o Amenities			Case 2: Project With Amenities		
		Total Aug. Peak Hr. Trips	Total Peak Traffic	% Increase	Total Aug. Peak Hr. Trips	Total Traffic	% Increase
1	637	43	680	6.7	36	673	5.6
5	637	118	755	18.5	84	721	13.2
10	637	228	865	35.7	157	794	24.6
15	637	339	976	53.2	232	869	36.4
20	637	344	981	54.0	234	871	36.7

These projections show that the anticipated future volumes of peak hour traffic are still below the service volume of Poipu Road.

#### ALTERNATIVES

A desired discussion on other alternatives related to different sites, project designs and land uses is acknowledged. With respect to alternative sites, this would necessitate acquiring additional land of a comparable size in another location in the Poipu resort area or similar resort setting elsewhere on Kauai or another island. This would not be considered as a practical alternative for the following reasons:

- Moana Corporation now has a lease for development of the project site, and the relocation of the proposed project to another site would require additional land acquisition or lease arrangements.
- The Kiahuna Golf Village will be developed as a compatible resort project with Moana Corporation's existing Kiahuna development located makai of the project site. The close proximity of the two projects will allow for the beneficial sharing of amenities which could not be possible if the Kiahuna Golf Village were to be developed elsewhere in the Poipu area or in a location outside the area.

In terms of project design, it must be recognized that the design shown in Figure I-2 in the EIS represents a development concept only, and not a precise development plan. More precise design plans will be formulated once a General Plan amendment and State land use reclassification have been obtained. Alternative detailed design plans will be considered, and the final plan will be presented to the County for review and approval as part of the rezoning application process.

With respect to alternative uses of the parcel, the following use considerations have been evaluated:

Park Development: This alternative assumes that the State or County would acquire all or a portion of the 480+ acre site from Moana Corporation for the purposes of utilizing the area for park and recreational purposes. With the possible exception of certain archaeological sites and the relatively flat terrain, the majority of the site area does not presently offer any park attributes and considerable landscape improvements would be required to create an attractive park or recreational environment. It is extremely unlikely, therefore, that the State or County would purchase the site for such purposes since:

- Acquisition funds for such an amount of land could probably not be obtained.
- Considerable additional funds would be required for land and landscaping improvements and maintenance.

- The public benefits of a 480-acre non-ocean front park at Poipu would be questionable. Kapiolani and Ala Moana Parks in Honolulu are about 140 acres and 76 acres respectively, and their population service areas are substantially larger than a service area which a large Poipu regional park would be expected to serve.
- Moana Corporation has committed itself to the dedication of 20 acres of the project site to the County as an addition to Poipu Beach Park.

Botanical Garden: From discussions with Paul Wysick, director of Foster Botanical Gardens in Honolulu, the most important requirement in initiating a botanical garden is the creation of a hospitable environment for various plant species. Transformation of the project site into a suitable environment for different plant species would require extensive site preparation. If a wide variety of tropical plants and trees were to be grown, this would mean removal or relocation of most of the rocks on the site; scarifying the base 2 or 3 feet of soil; adding new soil, and conditioning the soil with fertilizer and other additives. These site development costs would be considerable, and continued garden maintenance would require extensive fertilization and irrigation, specific to the needs of individual species of plants.

Again, size is a major consideration. Foster Botanical Gardens has an area of about 20 acres, with approximately 12 acres presently planted. Moanalua Gardens in Honolulu contains about 8 acres. Most botanical gardens are owned or sponsored by a public or quasi-public agency and user revenues generally do not offset capital development and operations costs.

Agriculture: Environmentally and geologically the site is not suited for agricultural uses. An evaluation of the site's agricultural potential was made by Jack Larsen, an agro-industrial consultant, in July 1975, and it was concluded that the project site has minimal agricultural potential. If zoning on the site were to continue in agriculture, the most economical use would be the present extensive cattle operation.

The major limitations to further agricultural development are lack of soil depth and inadequate and high cost water for irrigation. No known alternative crop could be grown economically in this area under present market and cost parameters.

The Land Study Bureau Bulletin #9 gives the project site land an "E" classification--the lowest of five productivity rating categories.

Industrial: The site offers no basic advantages for general or heavy industrial activities. While the more level topography could generally accommodate industrial structures and activities, such activities could in all probability be more economically viable in other geographic areas where the basic required infrastructure including water, power and proximity to markets already exist. Further, industrial activities would not be physically or environmentally compatible to surrounding resort uses.

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

Within the concept of the proposed development, the idea is to provide a complete community with commercial and recreational activities as well as residential dwellings in a controlled setting. The reason for the planned development is to get away from unchecked and unaesthetic urban sprawl. The presence of the Kiahuna Golf Village could, however, stimulate additional residential and commercial growth outside of the project.

An extensive discussion of secondary impacts is included on pages 212 through 270, and a discussion of potential lifestyle changes is included on pages 288 through 291 in the EIS.

Belt, Collins and Associates, Ltd.  
Honolulu, Hawaii  
July 21, 1976

Attachment 2

DIVERSION CHANNELS

Diversion channels "A" and "B" as proposed for the development implements a portion of the County's drainage general plan concept for the Koloa-Poipu region (General Plan - Water, Sewerage and Drainage; County of Kauai; by Sunn, Low, Tom and Hara; August, 1963). The primary purpose of the channels is to divert the sheet runoff from the lands between Koloa and Poipu that now ponds at the low lying areas along the old Poipu Road. The flood problems of the Poipu Beach area are well documented. Channels "A" and "B" will significantly reduce the amount of runoff reaching the flood prone areas. The diverted waters will be discharged into Waikomo Stream for eventual release into the sea.

The 50- and 100-year recurrence interval peak discharge rates of Channels "A" and "B" based on the County of Kauai Storm Drainage Standards are as follows:

Table 1: Channels "A" and "B" Discharges

Channel	Tributary Area	Peak Discharge Rate	
		50-Year	100-Year
"A"	345 acres	1,200 cfs	1,700 cfs
"A" w/extension	1,022 acres	3,400 cfs	4,700 cfs
"B"	165 acres	600 cfs	800 cfs

WAIKOMO STREAM HYDRAULICS

The increase to the Waikomo basin area by Channels "A" and "B" is small, from 10.4 to 11.2 square miles. The effect on the Waikomo Stream peak discharge rates is even less significant. The following table shows the actual increase to the Waikomo Stream peak discharge rates for storms of various frequencies based on the County's Storm Drainage Standards.

Table 2: Waikomo Stream Discharge

Drainage Basin	Area (Square Miles)	Peak Discharge Rate	
		50-Year	100-Year
Existing	10.4	13,000 cfs	20,800 cfs
With Channels "A" and "B"	11.2	13,600 cfs	21,600 cfs
With Channels "A", "B" and "A Extension"	12.0	14,200 cfs	22,800 cfs

The project proposes to construct Channels "A" and "B". The extension of Channel "A" is to be implemented as part of the County General Plan. The increase to the Waikomo Stream flow is 600 cfs or 4.6% for the 50-year storm and 800 cfs or 3.8% for the 100-year storm.

The U.S. Army Corps of Engineers and other government agencies have done several studies of the Waikomo River basin. The Corps of Engineers standard project flood discharge for the lower reaches of the stream is 26,400 cfs. Its 10-year, 50-year and 100-year frequency floods are 9,900; 15,700; and 18,200 cfs respectively. The Corps estimates the capacity of the two Waikomo Stream culverts at Poipu Road to be 7,000 cfs. This is less than the 10-year frequency flood of 9,900 cfs. Therefore, any unusual storm may cause the overtopping of the stream banks and flooding of adjacent lands to occur.

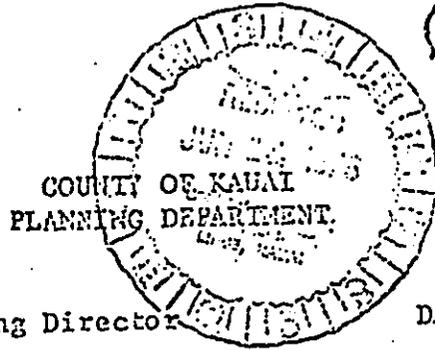
The Flood Insurance Study, Type 15: Koloa-Poipu Vicinity, Kauai, Hawaii, by R.M. Towill for the Federal Insurance Administration, defines the Waikomo Stream water profile and inundation limits for the 100-year frequency flood. The criteria used in the study is based largely on the Corps of Engineers data and discharge rates. The attached Plate 13 from the report shows the flood water surface profile for the 10-year, 100-year and the standard project floods. The difference between the standard project flood ( $Q = 26,400$  cfs) and the 100-year flood ( $Q = 18,200$  cfs) is about one foot. Therefore, using the 800 cfs increase (100-year flow, Table 1) to Waikomo Stream by Channels "A" and "B" for a generalized comparison, the increase to the flood level should be less than a quarter foot, depending upon variations in the stream cross-sectional areas and floodway widths. Plotting of several cross-sections verified this.

The R.M. Towill study assumes that the fringe area between the floodway where actual flow movement occurs and the outer flood water limits have no storage capacity or flow. This is a conservative assumption. Therefore, the effects of Channels "A" and "B" on Waikomo Stream in relation to the limits shown in the R.M. Towill study should be negligible.

In conclusion, the existing Waikomo Stream cross-sectional area and culvert/bridge crossings are inadequate for design discharges established by the County and Corps of Engineers. Channels "A" and "B" will divert additional runoff to the Waikomo Stream floodway; however, review of the R.M. Towill study shows that the effect should be negligible.

Channels "A" and "B" will be a definite benefit to the now flood prone areas along Poipu Beach Road.

Belt, Collins and Associates, Ltd.  
Honolulu, Hawaii  
July 21, 1976



FROM: Brian Nishimoto, Planning Director

DATE: June 4, 1976

SUBJECT: General Plan Amendment, CPA-76-6; Moana Corporation

- TO: ( ) Public Works Dept.  
( ) Water Dept.  
( ) State Health Dept.  
 State Highways Division  
( ) Fire Dept.  
( ) Economic Development Office  
 Kauai Electric Co.  
 Sam Lee (DLNR)  
( ) State Dept. of Agriculture  
( )

NOTE: Your agency is not expected to review the total EIS, but only those portions which affect your agency.

FOR YOUR COMMENTS (pertaining to your department):

*No comments*

Signature

*Ed Nakano*

*4/10/76*

Please return one (1) copy by June 30, 1976. Thank you.



STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 869 PUNCHBOWL STREET  
 HONOLULU, HAWAII 96813

WALLACE A. ...  
 RYONICHI HIGASHIMURA  
 DOUGLAS S. SAMPALTO  
 CHARLES O. SWANSON

IN REPLY REFER TO:

July 12, 1976

STP 8.3738

Dr. Albert Tom, Chairman  
 Environmental Quality Commission  
 550 Halekauwila Street, Room 301  
 Honolulu, Hawaii 96813

Dear Dr. Tom:

Subject: An Analysis of the Economic, Social and  
 Environmental Impacts of Kiahuna Golf  
 Village

Thank you for the opportunity to review the subject state-  
 ment.

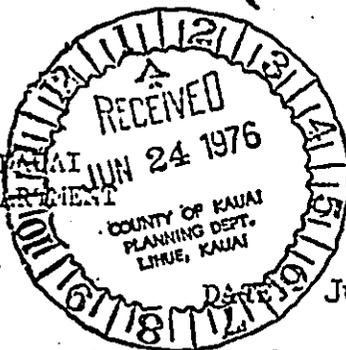
We have no comments to offer on the impact statement as  
 it relates to and affects our transportation facilities.

The delay in providing this response is regretted.

Sincerely,

*E. Alvey Wright*  
 E. ALVEY WRIGHT  
 Director

COUNTY OF KAUAI  
PLANNING DEPARTMENT



FROM: Brian Nishimoto, Planning Director

June 8, 1976

SUBJECT: General Plan Amendment, GPA-76-6; Moana Corporation

- TO: ( ) Public Works Dept.  
( ) Water Dept.  
( ) State Health Dept.  
( ) State Highways Division  
( ) Fire Dept.  
( ) Economic Development Office  
( ) Kauai Electric Co.  
( ) Sam Lee (DLNR)  
( ) State Dept. of Agriculture  
(X) State Department of Education

FOR YOUR COMMENTS (pertaining to your department):

We have reviewed the pertinent portions of the subject EIS and the educational impact appears to be reasonable. We do not anticipate any difficulties in being able to accommodate students that would become a part of the development.

Signature 

Please return one (1) copy by June 30, 1976. Thank you.

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. Box 3378  
HONOLULU, HAWAII 96801

March 9, 1976

GEORGE A. L. YUEN  
DIRECTOR OF HEALTH

Audrey W. Mertz, M.D., M.P.H.  
Deputy Director of Health

Henry N. Thompson, M.A.  
Deputy Director of Health

James S. Kumagai, Ph.D., P.E.  
Deputy Director of Health

In reply, please refer to:

File: EPHS - SS

Mr. Robert L. Harmon  
President  
Moana Corporation  
451 Jackson St.  
San Francisco, California 94111

Dear Mr. Harmon:

Subject: Request for Comments on Proposed Environmental Impact Statement  
for Kiahuna Golf Village, Poipu, Kauai

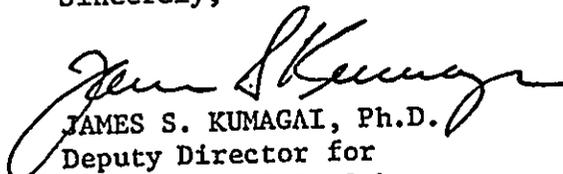
Thank you for allowing us to review and comment on the subject proposed  
Environmental Impact Statement.

Staff comments are as follows:

- (1) Our major concern in the Poipu area is the provision of acceptable  
sewage treatment disposal systems. We are unable to comment  
without being able to review and evaluate development or construction  
plans for the proposed project.
- (2) Likewise, we are unable to comment in regard to other types of  
pollution: noise, air, and water (construction wastes, erosion, etc.)

We realize that the statements are general in nature due to preliminary  
plans being the sole source of discussion. We, therefore, reserve the right  
to impose future environmental restrictions on the project at the time final  
plans are submitted to this office for review.

Sincerely,

  
JAMES S. KUMAGAI, Ph.D.  
Deputy Director for  
Environmental Health

cc: DHO, Kauai

LH ✓  
JV ✓  
PH ✓  
Fli  
75-10-01

March 23, 1976

Dr. James S. Kumagai, Ph. D.  
Deputy Director for Environmental Health  
State of Hawaii  
Department of Health  
P. O. Box 3378  
Honolulu, Hawaii 96801

Dear Dr. Kumagai:

Your letter of March 9, 1976, regarding the proposed Environmental Impact Statement for Kiahuna Golf Village, Poipu, Kauai, has been referred to me for reply.

The proposed Golf Village will be serviced by expansion of the sewage treatment disposal system currently under construction in the Poipu area, funded by Moana Corporation, Island Holidays, and Ohbayashi-Gumi. The development and construction plans will be submitted to your office for review and evaluation.

Noise, air and water pollution are discussed in the Environmental Impact Statement which will be submitted to Kauai County and the State Office of Environmental Quality Control in April. We would appreciate your review and comments.

Sincerely yours,

*JRB*  
James R. Bell

JRB:glc

cc: Robert Harmon

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. Box 3378  
HONOLULU, HAWAII 96801

June 23, 1976

GEORGE A. L. YUEN  
DIRECTOR OF HEALTH

Audrey W. Mertz, M.D., M.P.H.  
Deputy Director of Health

James S. Kumagai, Ph.D., P.E.  
Deputy Director of Health

Henry N. Thompson, M.A.  
Deputy Director of Health

In reply, please refer to:  
File: **EPHS-SS**

MEMORANDUM

To: Dr. Richard E. Marland, Director  
Office of Environmental Quality Control

From: Deputy Director for Environmental Health

Subject: Draft Environmental Impact Statement (EIS) for Kiahuna Golf Village,  
Kauai

Thank you for allowing us to review and comment on the subject EIS. Please be informed that we have several concerns regarding the subject project:

1. One major concern that we have and which is not covered in the Environmental Impact Statement is the odor problem from the sewage treatment plant from a resident who lives a few hundred feet downwind of the plant and from motorists who drive past the plant. The odor problem was also raised by someone during the informational meeting held by the Moana people. Much of the odor from the S.T.P. comes from the incoming sewage which has become septic from staying too long in the sewer lines. The problem seems to come about from a discrepancy in the design of the line and actual operation when the sewage generation is low. Moreover, the area makai of the S.T.P. is presently undeveloped but zoned R-20 and open (see map on page 5 of E.I.S.), and, if developed, would be a source of additional odor complaints.

We would like some kind of assurance that the above stated problem be corrected and that the plant be properly operated and maintained at all times.

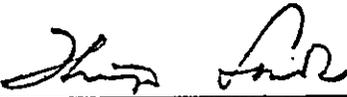
2. Another concern is the relatively close proximity of a proposed housing area to the existing cane haul road. To put a housing area this close to a cane haul road would subject the people to noise and possibly dust pollution which would be very difficult to control. There is no discussion of these concerns which we recommend to be addressed in the E.I.S.

Another possible noise problem not covered in the E.I.S. is the location of the Amphitheater which we believe is too close to the existing Weliweli subdivision.

June 23, 1976

3. Our last concern is the possible dust problem for the people who would already be living in the development and surrounding areas. Since the proposed overall development is a long range one, we would expect construction work to be going on constantly. To protect these people from any dust nuisance, we would like some means of dust protection or control of the dust from such construction.
4. The following are comments on the Environmental Impact Statement:
  - a. On page 179 the E.I.S. is inaccurate on the wind velocity; it is more like 15 to 25 mph, with gusts of 25 to 35 mph and at times more.
  - b. Pages 216-225. The E.I.S. states that the coastal water quality in this area (Poipu Beach area) will be affected by irrigation and fertilization of the project. The coastal water around this area is Class AA waters; as such, there should be no outside influence to affect the quality of these waters. At the present time the project area is not being used, except for the effluent from the present S.T.P. being used to irrigate some Haole Koa bushes. Therefore, the impact of the existing area on coastal water quality is non-existing.
  - c. Page 265. The E.I.S. addresses the noise pollution problem in one area only. They should also address the noise pollution problem at all critical areas. The E.I.S. should contain the present ambient noise pressure levels at all the critical areas, such as residential and development areas.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

  
SHINJI SONEDA

for JAMES KUMAGAI

cc: Kauai DHO  
Planning Department, Kauai  
Belt, Collins, & Assoc.

JV  
LH  
Fui

July 2, 1976

Dr. James S. Kumagai  
Deputy Director for Environmental Health  
State of Hawaii  
Department of Health  
P. O. Box 3378  
Honolulu, Hawaii 96801

Dear Dr. Kumagai:

We have received your comments of June 23, 1976, regarding the draft EIS for Kiahuna Golf Village, Kauai. The following is our response to your comments.

1) The force mains and lift stations of the existing Poipu sewer system are not intended to serve the proposed development for which the EIS was written and submitted. The existing sewage treatment plant site will be used for the treatment facilities for the project area. The wastewater system for the proposed project will be designed to applicable standards at the time of its construction. These plans will be submitted to your office for review and approval.

Regarding the existing system, the pump stations are not yet completed, and the lift station being used in the interim to convey wastewater may be causing septic conditions. The construction plans for the pump stations have allocated space for the addition of hydrogen peroxide to alleviate septic conditions should they occur. Concerning the operation and maintenance of the sewage treatment plant, Moana Corporation would welcome suggestions that could improve its operation.

2) Enclosed is a projection prepared by Belt, Collins & Associates, Ltd. in June, 1973, of noise levels due to truck usage on the cane haul road. The study was prepared for an environmental assessment of the cane haul road. It is felt that the noise levels experienced by the development will be within State standards because (1) the proposed golf course will act as a buffer between the developed area and the cane haul road and (2) landscaping will diffuse some of the sound generated on the cane haul road.

July 2, 1976

The amphitheater will abide by State noise regulations.

3) Dust generated during construction will be kept under control in compliance with the (Kauai) grading ordinance. Methods to be employed will most likely be the use of oil or water sprinkled on a dust-prone surface to keep the dust down. Control can be spelled out in the construction specifications. Dust from the cane haul road could be a problem if the road is not properly maintained by McBryde Sugar Company.

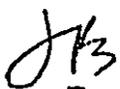
4) In lieu of accurate climatological data which is not available in the Koloa-Poipu area, wind velocity was estimated. These estimates were concurred with by personnel at the U. S. Weather Service at Honolulu International Airport. If more accurate wind data is available, we would be happy to include it in the EIS. The wind does reach higher velocities than noted in the EIS at times.

5) As stated in the EIS, the coastal water quality will be affected by irrigation and fertilization, but the effect is expected to be minimal. The turf grass and landscaping will utilize most of the fertilizers placed on the open areas, golf course, and other landscaped areas and will do so more effectively than the vast adjacent acreage of cane land. In addition, the existing surrounding development with its cesspools affects to a greater extent the coastal waters.

6) On Pages 265 to 270 of the EIS, noise generated by the proposed project was addressed. Present noise levels are within State standards, as there is no development. Noise generated by the project will be in compliance with these standards, both during and after construction, or mitigation measures will be employed.

We hope we have satisfactorily answered your questions.

Sincerely yours,

  
James R. Bell

JRB:gk

cc: Brian Nishimoto  
Richard Marland  
Robert Harmon - copy of Kumagai Hr. Encl.

Encl.

COUNTY OF KAUAI  
PLANNING DEPARTMENT

FROM: Brian Nishimoto, Planning Director

DATE: June 4, 1976

SUBJECT: General Plan Amendment, GPA-76-6; Moana Corporation

TO: ( ) Public Works Dept.  
( ) Water Dept.  
( ) State Health Dept.  
(X) State Highways Division  
( ) Fire Dept.  
( ) Economic Development Office  
(X) Kauai Electric Co.  
(X) Sam Lee (DLNR)  
( ) State Dept. of Agriculture  
( )

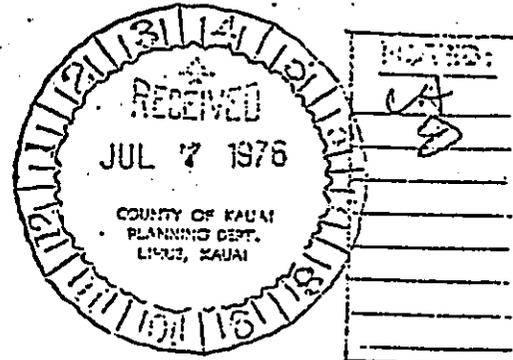
NOTE: Your agency is not expected to review the total EIS, but only those portions which affect your agency.

FOR YOUR COMMENTS (pertaining to your department):

The State of Hawaii is the owner of approximately 67 acres of vacant land north of the Weliweli Subdivision. Eventually, this property will be developed for residential use.

Access to the subdivision is furnished by Poipu Beach Road and the County road system funneling through Koloa Town.

With the volume of traffic to be generated by presently proposed and future-planned developments in the Poipu area, might it not be advisable to consider the possibility of implementing construction of the by-pass road to be located along the westerly boundary of the Weliweli lands?



Signature

*Sam Lee*

Please return one (1) copy by June 30, 1976. Thank you.

GEORGE P. ARIYOSHI  
GOVERNOR OF HAWAII



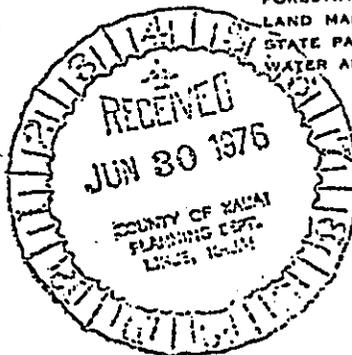
CHRISTOPHER COBB, CHAIRMAN  
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU  
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
P. O. BOX 621  
HONOLULU, HAWAII 96809

DIVISIONS:  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

June 25, 1976



NOTED:

Planning Department  
County of Kauai  
4280 Rice Street  
Lihue, Kauai 96766

Gentlemen:

We have reviewed the EIS for Kiahuna Village.

As stated in the EIS, the existing water system is operating near capacity and will be inadequate to serve the demands posed by the project. Due to the heavy additional water demand the developer should be made responsible for meeting water supply needs of the project and should be advised to prepare a water system plan. The Kauai County Department of Water Supply should be consulted and given an opportunity to review the plan and the effect upon the total water supply-demand requirements of the region.

As a result of the subject development, off site drainage improvements will be needed and should be the responsibility of the developer.

The treatment of historic sites on the property should be discussed and cleared with the Historic Preservation Officer at this address (Phone: 548-6408).

Very truly yours,

*Christopher Cobb*  
CHRISTOPHER COBB  
Chairman of the Board

cc: Historic Sites  
DOWALD

July 15, 1976

Mr. Christopher Cobb  
Chairman of the Board  
Department of Land and Natural Resources  
State of Hawaii  
P.O. Box 621  
Honolulu, Hawaii 96809

Dear Mr. Cobb:

Kiahuna Golf Village

This letter is in response to your comments on the Kiahuna Golf Village Environmental Impact Statement.

- The Kauai County Board of Water Supply will be consulted to determine project water supply demands with relationship to regional supply.
- The Moana Corporation will participate, to the extent of the proposed project's needs and involvement, with respect to offsite drainage improvements directly attributable to the proposed project.
- The Moana Corporation will cooperate fully with the Historic Preservation Officer in efforts to secure archaeologically significant sites.

We hope we have adequately answered your comments. If there are additional questions, please contact us.

Sincerely yours,



Joseph Vierra, Jr.

JV:kko

cc: Brian Nishimoto  
Robert Harmon



DEPARTMENT OF PLANNING  
AND ECONOMIC DEVELOPMENT

Kamamalu Building, 250 South King St., Honolulu, Hawaii • Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

GEORGE R. ARIYOSHI  
Governor

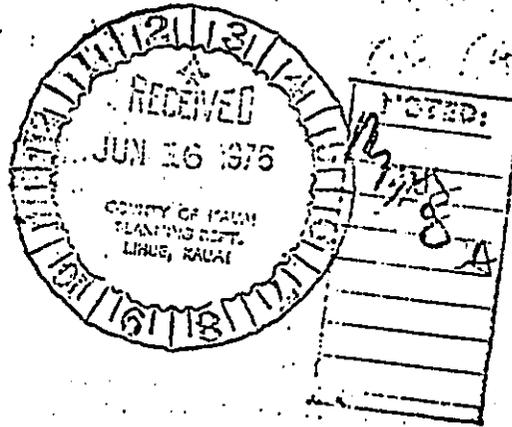
HIDETO KONO  
Director

FRANK SKRIVANEK  
Deputy Director

June 9, 1976

Ref. No. 1320

Mr. Brian K. Nishimoto  
Director  
Planning Department  
County of Kauai  
4280 Rice Street  
Lihue, Kauai, Hawaii 96766



Dear Mr. Nishimoto:

Subject: Environmental Impact Statement for the Proposed Kiahuna  
Golf Village, Poipu, Kauai

We have reviewed the subject statement and wish to offer the following  
comments for your consideration:

In Table III-11, "Moana Project Lot Sales Prices Relative to  
Kauai Residents' Ability to Pay," an admittedly low construction cost factor  
is used, based on the assumption that lot buyers will absorb a significant  
portion of normal costs by providing much of their own labor. Consequently,  
it is concluded that approximately 40 percent of Kauai households have the  
purchasing ability to buy the lowest priced project lots. We suggest that  
while the underlying assumption may be valid, additional analysis utilizing  
moderate and high construction cost indices may be necessary to effectively  
evaluate the potential availability of lots to residents.

Part I, Section IV, of the EIS cites recreation deficiencies as  
identified in the State Comprehensive Outdoor Recreation Plan. It should  
be noted that while SCORP does indicate a need for additional tennis courts  
on the island and in the area, it does not, as suggested, identify golf  
courses as "a possible problem area in the future." In assessing recreation  
needs for the Koloa-Poipu area, SCORP lists golf as a lower priority item.

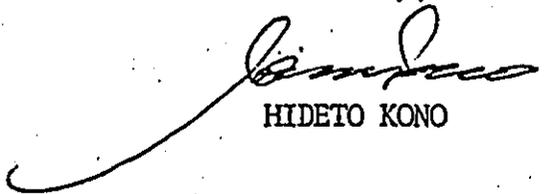
Finally, we note that in the discussion of the Poipu visitor  
plant (Page 69), other pending/proposed developments are identified but not  
included in the analyses. This is understandable due to the difficulty  
in predicting the probable implementation of a given proposal. Nonetheless,

Mr. Brian K. Nishimoto  
Page 2  
June 9, 1976

it is felt that in the absence of a County Development Plan for the area, analyses should attempt to recognize not only the contributory effects of the subject proposal, but also, to a reasonable degree, the potential impacts of cumulative development in the region.

We have no further comments to offer at this time, but appreciate the opportunity to review the subject statement.

Sincerely,



HIDETO KONO

cc: Belt, Collins, & Associates

Richard J. Smart  
1845 Leavenworth Street  
San Francisco, California 94109  
(415) 771-6200

July 19, 1976

Mr. Hideto Kono  
Department of Planning and Economic Development  
P. O. Box 2359  
Honolulu, Hawaii 96804

Subject: Environmental Impact Statement for the  
Proposed Kiahuna Golf Village, Poipu, Kauai

Dear Mr. Kono:

Thank you for your comments regarding the above-referenced Environmental Impact Statement.

1. Several commentators have made points similar to yours relating to estimates that 40% of Kauai households have the purchasing ability to buy the lowest priced project lots. The estimate was based on Kauai income figures and a rule of thumb formula used by financial institutions to determine the amounts of money that households at given income levels can afford to pay for housing. The question that has arisen relates to our inclusion in the total housing cost estimates (lot price plus construction cost) an assumption that, consistent with customary practice on Kauai, many local purchasers of the low priced lots would provide much of their own labor for finishing work and landscaping. This approach resulted in a total housing cost which would make 40% of Kauai households economically able to buy lots in the proposed project.

We think the assumption about substantial construction being provided for such homes by no-cost labor is correct. However, even should the amount of such labor that would be used be less than anticipated, the actual availability of lots is much less than the number of lots implied by 40% of Kauai households. That figure was an estimate of the number of households estimated to be able to afford such lots. The actual estimate of lots that would be purchased by Kauai residents results from a combination of the supply of lower priced lots and our housing market analysis. We estimated that 25 to 30% of the development's lots would be sold to Kauai residents. Thirty percent would be a total of 90 lots.

The response which we made to the comments of Mr. Akira Fujita, Kauai County Engineer, who made a similar point to yours, may be of interest to you, since it relates to some other aspects of the question. The following paragraphs set forth that response.

Mr. Hideto Kono  
July 19, 1976  
Page Two

Comment: "The report lists projected lot prices of \$5,000 and up and the cost of a home at \$25,000 and up. These prices seem very unrealistic, especially for development around a golf course."

The lot prices you referred to are for the lowest priced lots. The range of prices likely will include lots at \$15,000 and over. The overall financing planning for the project is based on a price structure for condominiums and lots which, taken as a whole, will result in a financially viable project. However, it is clear that the lowest priced lots not only do not include a profit, their estimated prices very likely are lower than their actual development costs. Hence, in that sense, you are quite right in calling them "unrealistic."

However, the developer has made an explicit decision that, in order to provide an opportunity for moderately priced local housing, Moana Corporation and the purchasers of higher priced lots will, in effect, jointly subsidize the cost of the low priced lots.

The estimated construction costs of the single family units on the low priced lots is more problematical. The estimates were based on the analysis of our housing market analyst and contained an assumption that much of the work on these units would not be provided by conventional contract labor:

"A rather low construction cost factor has been utilized on the basis that owners will provide much of the labor for construction finishing and landscaping. This assumption is reasonable inasmuch as it is customary on Kauai for the owner and family and friends to provide a significant portion of the necessary labor."

The cost estimates for construction of units on the low priced lots clearly are unrealistic if this assumption turns out to be unjustified. Even with the assumption, construction costs may be higher for some of the buyers of the low priced lots since the degree of owner participation in "finishing" work will vary widely among the purchasers. However, regardless of the actual construction costs which develop for units on these lots, depending on the degree of use of non-contract labor by owner-occupants, it is clear that the subsidized lot prices afford an opportunity for local housing which does not exist elsewhere in the county in a project of comparable quality. Local residents will continue to build new houses someplace as indicated in the market data. While material and contract labor costs are functions of the general economy, are not within the control of the homebuilder, and hence could go substantially higher, the lot prices provide a basis for a total cost level for moderate income quality housing below that which is generally available in Kauai.

Mr. Hideto Kono  
July 19, 1976  
Page Three

Finally, a general caveat should be noted. All of the prices are preliminary estimates. The actual pricing structure for the development could vary substantially depending on the state of the economy in general and the construction industry in particular. However, according to the developer, what will not change materially is the commitment to maintain a price range for lots which provides, in the indicated numbers, lots priced proportionately lower than the higher priced lots, as indicated in the report, for moderate income purchasers.

2. Thank you for correcting our interpretation of the SCORP study insofar as it relates to additional golf courses being a relatively low priority item. It is uncertain at what point in the future the need for additional golf course facilities will become apparent. However, we would note that no golf course exists to accommodate the growing visitor population in the immediate Poipu area. Also, the land upon which the proposed development is to be developed needs complete landscaping if it is to be used for the proposed purpose. The golf course will be an effective way of achieving beautiful landscaping while, at the same time, providing increased recreational opportunity for both the local population and visitors to the area.
3. You noted that "in the discussion of the Poipu visitor plant (page 69) other pending/proposed developments are identified but not included in the analyses. This is understandable due to the difficulty in predicting the probable implementation of a given proposal. Nonetheless, it is felt that in the absence of a County Development Plan for the area, analyses should attempt to recognize not only the contributory effects of the subject proposal but also, to a reasonable degree, the potential impacts of cumulative development in the region."

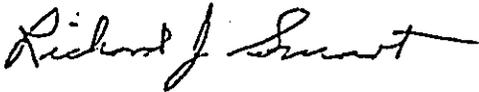
Such an analysis undoubtedly would be useful, but was well beyond the scope of this study. To require a single developer to finance an analysis of the economic impacts of all other potential developers' projects in an area would impose an unreasonable burden. Moreover, there are difficult practical problems. Such a study would require in-depth analysis of other developers' plans, which are in various stages of detail and sophistication. Candid disclosure of plans to a consultant retained by a competitor would be difficult to obtain. Developments which may be at a very "iffy" stage, in respect to which little site planning has been undertaken, and in respect to which no financing has been obtained, would be represented as "certain" to be constructed. The likelihood is that the results would be seriously skewed by inclusion of developments which are little more than ideas, and that governmental agencies' decisions in respect to immediately viable proposals would be affected by proposals which are not close to being realities.

Mr. Hideto Kono  
July 19, 1976  
Page Four

The more serious obstacle, however, is simply the inability of a single developer to finance the financial planning and economic analysis of other developers in the County, regardless of the stages at which their planning may be. We think that the County's requirement of an economic and social impact analysis for a project of this size certainly is in the public interest. But it would seem that the only viable approach to getting this kind of information produced, short of a countywide study, is to require potential developers to conduct such studies when their planning and financing gets to a serious enough stage to motivate them to finance the work for their own projects.

-----  
We appreciate your comments and hope the responses have been useful to you. Please let me know if you require any further information.

Very truly yours,



Richard J. Smart

cc: Mr. Brian Nishimoto ✓  
Belt, Collins and Associates, Ltd.

GEORGE R. ARIYOSHI  
GOVERNOR



VALENTINE A. SIEFERMANN  
MAJOP GENERAL  
ADJUTANT GENERAL

STATE OF HAWAII  
DEPARTMENT OF DEFENSE  
OFFICE OF THE ADJUTANT GENERAL  
FORT RUGER, HONOLULU, HAWAII 96816

HIENG

4 JUN 1976

Dr. Albert Tom, Chairman  
Environmental Quality Commission  
550 Halekauwila Street  
Honolulu, Hawaii 96813

Dear Dr. Tom:

Kiahuna Golf Village

Thank you for sending us a copy of the Environmental Impact Statement for the proposed "Kiahuna Golf Village." We have reviewed the publication and have no comments to offer.

We are returning the Environmental Impact Statement for the proposed project per your request.

Yours truly,

*Frederic W. Kaveh*  
for WAYNE R. TOMOYASU  
Captain, CE, HARNG CPT, CE, HARNG  
& Engr Officer

Enclosure

GEORGE F. ANNESTON  
GOVERNOR



JOHN FARIAS, JR.  
CHAIRMAN, BOARD OF AGRICULTURE

YUKIO KITAGAWA  
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII  
DEPARTMENT OF AGRICULTURE  
1428 SO. KING STREET  
HONOLULU, HAWAII 96814

July 15, 1976

MEMORANDUM

To: Environmental Quality Commission

Subject: An Analysis of the Economic, Social and Environmental  
Impacts of Kiahuna Golf Village - Poipu-Koloa  
TMK: IV - 2-8-14

The Department of Agriculture has reviewed the final Environmental Impact Statement (EIS) and has no additional comments. The copy of the EIS has been retained for further reference.

Thank you for the opportunity to comment.

*for Yukio Kitagawa*  
John Farias, Jr.  
Chairman, Board of Agriculture

JK:d:d

Route to:	
<input type="checkbox"/>	Belt, R. M.
<input checked="" type="checkbox"/>	Bell, J.
<input checked="" type="checkbox"/>	Hirota, P.
<input type="checkbox"/>	Lyon, F. E.
<input type="checkbox"/>	Ng, W.
<input checked="" type="checkbox"/>	Vierra, J.
<input type="checkbox"/>	Wallrabonstein, P.
<input type="checkbox"/>	Cain, R.
<input type="checkbox"/>	Hasterl, M.
<input checked="" type="checkbox"/>	Helber, L.
Action by _____	
Description _____	
Office of the Director	
File. Job # _____	



**RECEIVED**

JUL 9 1976

DELT, COLLINS & ASSOCIATES, LTD.

**University of Hawaii at Manoa**

RE:0203

Environmental Center  
 Crawford 317 • 2550 Campus Road  
 Honolulu, Hawaii 96822  
 Telephone (808) 948-7361

8 July 1976

MEMORANDUM

TO: Don Bremner  
 Deputy Chairman, EQC

FROM: Jacquelin Miller  
 Acting Director

An Analysis of the Economic, Social and  
 Environmental Impacts of Kiahuna Golf Village

The Environmental Center has been assisted in the review of the above cited Environmental Impact Statement by John Beardsley, Entomology; Marshall Mock, Kauai Community College; Sheldon Varney, Educational Administration; and Jacquelin Miller, Margaret Stanzione and Leonard Wilson, Environmental Center.

The EIS is very comprehensive of the potential economic impact for the county of Kauai as a whole. However, we feel the following areas need further consideration.

Page 16.

Although 38.6% of Kauai's residents can afford houses selling for \$33,000 or more, it is unknown how many will actually want to buy homes in a resort complex. A detailed description of a \$27,500 house should be included in the EIS as \$27,500 seems to be a very low figure for housing construction.

Page 18.

"We estimate that, in 1968, the Moana Project non-resident population will comprise 2.15% of total overnight visitors." We assume the year "1968" is an error. The final EIS should be modified to indicate the correct figure.

Page 19.

"Opportunity Cost" = project net revenue less "new project alternative" net revenue. Opportunity cost is \$11,993,000.

It is clear that certain revenues would accrue from the project. However, it is not clear if the use of "opportunity cost" is meant to represent public cost.

Page 20.

It is estimated that construction over a 15 year period will create 105 jobs annually. The estimated time duration of each job classification should be given since it is conceivable that the creation of 105 construction jobs may result in 105 unemployment claims, thus causing a burden on State Unemployment Funds.

Based on the total of jobs anticipated at the end of the 15 year construction period, the EIS states that these 390 jobs will earn an estimated \$3,637,600 annually. This means that in 1992 the estimated average monthly wage would be \$776.00. Therefore, the estimated annual income in 1992 (\$9,320) is well below Kauai's 1974 median household income of \$10,750. Due to increased inflation it would appear that the 390 jobs in 1992 would be marginally below the median income and may therefore require State assistance such as food supplement.

Page 20 - 21.

What is meant by "the average wage dollar paid in Kauai got spent 3.09 times during the year"? What is meant by "a construction job creates 1.41 jobs throughout the county's economy, and a hotel-related job creates 1.20 jobs throughout the economy."? Do these figures mean that one construction worker and one hotel related job provide employment for 1.41 and 1.20 people respectively? Thus 105 construction jobs and 390 servant jobs would provide  $[105(1.41)]148.05$  and  $[390(1.20)]468$  jobs respectively. If this is so, what will happen to the 148 jobs provided by construction employment when the construction workers are "laid-off"? How were these figures derived?

Page 21 - 27. Social Impact

The social impact of a development is the relationship of a development to the existing social conditions. The EIS does not describe what the present social conditions of the Poipu - Koloa area are. Therefore, the EIS has not properly assessed the potential social impact upon the area.

The EIS addresses the social amenities within the proposed development rather than the impact of the proposed development upon the present community.

Page 21.

The social impact is discussed as an economic-impact and a physical impact rather than an actual social impact. There is no mention in the EIS of the residents in the area -- their occupations, their recreational preferences, their views on this resort development.

Page 24.

"...it is obvious that an estimated addition of an average population of 2,688 people will have an impact upon the lifestyle of the Koloa - Poipu area. However, we think that the added population would represent simply a continuation of an existing trend which in fact represents the official policy of the County." Regardless of the official policy of the County, specifically what impact upon the lifestyles of residents will the increased population of the project create? Since the area of the project is potentially designated for tourism, the Moana Project will not provide the only additional increase in population. The potential impact of the Moana Project should be described in relation to other proposed, planned, and ongoing projects, as well as the existing population within the area.

Page 24 - 26.

"The major question, then, is not whether resort facilities should be developed in the area; rather, it is how many people can be accommodated there without damaging the unique quality of the area, and what kinds of developments will best encourage development of a visitor population whose values are consistent with existing Kauai lifestyles and a rate of population growth sufficiently slow to permit ease of assimilation."

We do not see how tourists and the existing Kauai residents can have mutual interests and values. Both groups should be able to occupy the same geographical location without infringing upon each other's values. Although it may be important to "assess the characteristics" and "motives" of tourists who visit a given area in order to determine their behavior and provide certain needs, such an assessment is totally meaningless to the potential social impacts upon the residents. To imply that the potential "condominium owner and extended guest" within the proposed project would be "motivated to participate in the existing lifestyle" seems to contradict the meaning of "containment factor." If occupants are "contained on-site", how will they by "participating" in the existing lifestyle of the Koloa - Poipu area?

Page 28. Housing

The EIS maintains that Kauai is in need of permanent housing. It is stated that 40% of the households can afford lots. As mentioned elsewhere in our comments, we question this 40% figure because although 40% of the households may be able to afford a lot, only 35% of the households could afford both a lot (@\$7,300) and a home (@\$27,500).

Page 29.

The configuration of the Moana Project may indeed provide a concept of open space, however a golf course requires a large amount of acreage that is restricted from general recreation opportunities such as leisurely walking or picnicking. In this sense, the Moana Project may exacerbate the need for more open space that is suitable for recreation rather than the sport of golf.

Page 29. Local Business Opportunities

When will the project's shopping center be operational? It would appear that incremental increases in population at the project would not warrant the immediate provision of commercial facilities. Have local businessmen expressed the desire to operate new business shops at the project?

Page 29. Secondary Economic Impacts

It may be presumptuous to assume that jobs created directly or indirectly by the project would reduce welfare payments or provide better health service. Although employment opportunities will occur, those opportunities related to construction may be temporary. Jobs created through the "multiplier effect" as a result of construction jobs may also be temporary.

Page 30. Recreational Opportunity

We are pleased to read that a 20 acre parcel will be donated to the County. Will the Moana Corporation develop this park land or will the County?

Page 30 - 31. Cultural Opportunities

The concept of the outdoor theater will be an added asset to the residents of Kauai. What will comprise the cultural center?

Page 31. County Finances

Expansion of the tax base is a short term solution to the inescapable problems that are occurring in a growth oriented economy. At some given time, short term or long term, it must be recognized that expanding the tax base as a means of stabilizing or increasing economic output is a circular measure which ultimately must be halted. Growth can not proceed indefinitely in a finite area.

Page 57.

The "Percentage Distribution" in Table III - 10 adds up to a total of 100.1 percent. This .1 percentage should be corrected or explained.

Page 59.

Although the EIS states that 36.8% of Kauai's households may be able to afford \$33,000 or more for a house, it is not clear if this figure is accurate because of the following: It is stated earlier in the EIS (page 16) that 38.6 percent of the households could afford \$33,000 or more for a house; it is illustrated (page 60) that each lot size will require a certain house size. It is not clear if the Moana Corporation will build these houses or if the lot owner will choose a builder. In either case, the listed figures that reflect \$25,000, \$27,500, \$30,000, and \$35,000 construction costs are meaningless without the square footage of each unit.

Page 59 states that 40% of Kauai residents would be able to afford the lowest priced single family housing and page 55 says that 25-30% of the expected buyers are expected to be from Kauai, 20-25% from the rest of the State. This seems to be misleading. First, Kauai residents able to afford the larger lots and housing may well own their homes already. Secondly, Kauai residents who can afford the smaller and hence cheaper housing may find them too small for their needs (average family size on Kauai is 3). It would seem unlikely that someone would move to Kauai without a job as Kauai's unemployment is the highest in the State. When considering these factors, it seems that more of the prospective buyers will have to come from outside the State. This will involve the consideration of the impact of the new residents on the already aggravated job market on Kauai.

Developments such as the proposed Moana Project usually require certain standards of construction conformity. Will this project offer a variety of housing designs or will the design be chosen solely from the lot owners desires?

What is meant that "a rather low construction cost factor has been utilized on the basis that owners will provide much of the labor for construction finishing and landscaping?" Specifically what is meant by "construction finishing" -- siding, roofing, caulking, outside trim, lanai railings, window bats, bathroom fixtures, lighting fixtures, cabinets, closet fixtures and interior-exterior painting may all be, and are not all of the items that can be considered as construction finish work. Exactly what does the low construction costs exclude? Will the housing construction be open to contract bidding? What is the anticipated minimum or maximum square footage per unit for each lot area?

These classifications are needed to determine first, exactly what is meant by the housing cost figures since these figures may represent an unfinished house, and second, whether or not (38.6%) or (36.8%) of the households on Kauai could a) afford a \$33,000 house/lot with additional but essential costs and b) would desire the footage/area of the lot and house as a permanent residence.

Page 61. The Hotel-Condominium Visitors Markets in Hawaii

The EIS states that "the success of the proposed project is partially dependent upon the future strength of the Hawaii visitor, hotel and condominium markets."

Taking note of "the projected price schedule for lots" on page 54 and Tables 111 - 20, 111 - 21 on pages 72 and 73, it appears that the success of the Moana Project depends largely on the tourist industry and "second-home" condominium purchases. The price schedule on page 54 illustrates that of the total amount of lots, 200 would be affordable to approximately 84 percent of the households. These 200 lots are approximately 14% of the total projected units. According to data on Tables 111 - 2 and 111 - 21, the approximate

cost of a one-bedroom unit condominium and a two-bedroom unit condominium at the Kiahuna development is \$75,750 and \$97,150 respectively. It is stated on page 71 that the Kiahuna units are "indicative of the quality, size, and cost/price structure of the units in the proposed Moana Project." Realizing that these prices may be lower than the actual selling price, it is inconceivable that more than 8% of Kauai's households could afford these units. Therefore, it may be inaccurate to assume that 75 multiple-family units per year (as stated on page 16) are equal to 30% of the annual demand because these units may be unaffordable to at least 92% of the households. For these reasons we question the accuracy of the statement of the project's success as being "partially dependent" on tourism.

Page 75.

Since not all of the condominiums are intended for permanent residents but rather are intended as rentals for tourists a discussion of the potential to rent these condominiums should be discussed.

Page 118.

We see no education problems nor do we anticipate a significant impact on enrollment.

Page 127. Electricity

What is meant by the statement, "the proposed Moana Project is not expected to place excessive demands on Kauai's total energy system, provided that development occurs in an orderly manner"?

Page 139.

The 390 jobs provided by the Moana project will not have a significant effect on Kauai's unemployment rate because of the increase in population from outside the State. Where will the new residents of Kiahuna be employed?

Page 172.

"An additional source of domestic water must be developed as the project is developed over time because the present system is near capacity."

The EIS should explain how additional water supplies will be developed and to what extent the total water supply for the county will be affected.

Page 196.

We strongly recommend a biological and archeological survey of the area. Incidentally, there are no mongoose on Kauai.

Page 198. Archeological Sites

Page 198 states that a preliminary Bishop Museum survey had found 155 sites on 200 acres. Figure 1 - 2 (page 5) indicates medium density for this area. But page 228 states that the Moana Corporation, developers of the project, intends to preserve the "significant" remains. Dr. William Kikuchi, who took part in the Bishop Museum survey, feels that there are more things of archeological interest (per square foot) that he has asked for a more comprehensive study of the area. Except for the sewage treatment plant and the tennis courts, both erected by the Moana Corporation, the site complex seems to be intact. In light of this, an alternative of an historical park for this area should be addressed.

We appreciate your consideration of our comments and the opportunity to participate in the review of this EIS.

*Dorothy Rosario*

*for*

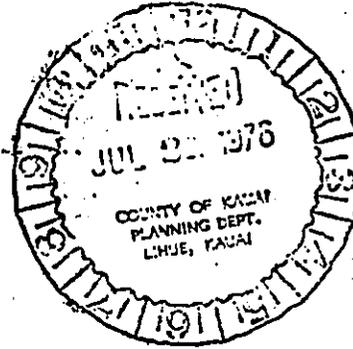
Jacquelin Miller  
Acting Director

cc: Planning Dept.  
✓ Belt, Collins & Assoc.  
Contributors

Richard J. Smart  
1845 Leavenworth Street  
San Francisco, California 94109  
(415) 771-6200

July 19, 1976

Mr. Don Bremner, Deputy Chairman  
Environmental Center  
University of Hawaii at Manoa  
Crawford 317 - 250 Campus Road  
Honolulu, Hawaii 96822




Subject: An Analysis of the Economic, Social, and Environmental Impacts of  
Kiahuna Golf Village

Dear Mr. Bremner:

Thank you for comments in regard to the above-referenced "Analysis of the Economic, Social, and Environmental Impacts of Kiahuna Golf Village." As the consultant responsible for the economic and social impact parts of the study, I have been asked to respond to your comments. The page references below follow the format of your letter.

Page 16

Several commentators have made the same point -- i.e., that the estimated figure for the least expensive house which an owner might construct on the least expensive lot seems low. The estimate was based on the findings of our housing market analyst, including the fact that substantial numbers of Kauai residents use their families, their friends, and their own free labor in the finishing and landscaping of owner occupied homes. I should like to respond to several aspects of the issue which are implied by your comment by incorporating the responses which I have to comments by the Office of Environmental Quality Control and by the Kauai Chief Engineer.

Comment: "The report lists projected lot prices of \$5,000 and up and the cost of a home at \$25,000 and up. These prices seem very unrealistic, especially for development around a golf course."

The lot prices you referred to are for the lowest priced lots. The range of prices likely will include lots at \$15,000 and over. The overall financial planning for the project is based on a price structure for condominiums and lots which, taken as a whole, will result in a financially viable project. However, it is clear that the lowest priced lots not only do not include a profit, their estimated prices very likely are lower than their actual development costs. Hence, in that sense, you are quite right in calling them "unrealistic."

Mr. Don Bremner

July 19, 1976

Page Two

However, the developer has made an explicit decision that, in order to provide an opportunity for moderately priced local housing, Moana Corporation and the purchasers of higher priced lots will, in effect, jointly subsidize the cost of the low priced lots.

The estimated construction costs of the single family units on the low priced lots is more problematical. The estimates were based on the analysis of our housing market analyst and contained an assumption that much of the work on these units would not be provided by conventional contract labor:

"A rather low construction cost factor has been utilized on the basis that owners will provide much of the labor for construction finishing and landscaping. This assumption is reasonable inasmuch as it is customary on Kauai for the owner and family and friends to provide a significant portion of the necessary labor."

The cost estimates for construction of units on the low priced lots clearly are unrealistic if this assumption turns out to be unjustified. Even with the assumption, construction costs may be higher for some of the buyers of the low priced lots since the degree of owner participation in "finishing" work will vary widely among the purchasers. However, regardless of the actual construction costs which develop for units on these lots, depending on the degree of use of non-contract labor by owner-occupants, it is clear that the subsidized lot prices afford an opportunity for local housing which does not exist elsewhere in the county in a project of comparable quality. Local residents will continue to build new houses someplace as indicated in the market data. While material and contract labor costs are functions of the general economy, are not within the control of the homebuilder, and hence could go substantially higher, the lot prices provide a basis for a total cost level for moderate income quality housing below that which is generally available in Kauai.

Finally, a general caveat should be noted. All of the prices are preliminary estimates. The actual pricing structure for the development could vary substantially depending on the state of the economy in general and the construction industry in particular. However, according to the developer, what will not change materially is the commitment to maintain a price range for lots which provides, in the indicated numbers, lots priced proportionately lower than the higher priced lots, as indicated in the report, for moderate income purchasers.

Mr. Don Bremner  
July 19, 1976  
Page Three

Page 18 (Your reference; the correct page is page 19.)

You are correct. The reference to the year 1968 should read 1978. (See Table III-19, page 70.)

Page 19

Your question related to use of the term "opportunity cost." The confusion apparently derives from an erroneous quotation from the report: "Opportunity Cost = project net revenue less new project alternative net revenue." Our statement did not refer to a "new" project alternative, but to a "no" project alternative. The opportunity cost is the cost to the county of having no project approved. This is not a cost represented by the expenditure of County funds. Rather, if the project is not approved, it is the cost of giving up the net revenues which otherwise would come to the County through development of the project. The difference between the revenues which would be realized by the County through continued taxation of the property in its present condition, and the net revenues which are estimated to be realized by the County if the property is developed as proposed, is \$11,933,000. That is the cost to the County in terms of foregone opportunity — i.e., net revenue which would have been realized through a completed project.

Page 20

The estimated time duration of construction jobs already is given. We estimate 105 construction jobs annually. That is a constant. Hypothetically, each such job could be held by the same employee for 15 years. In actuality, of course, that would not occur. However, we have no way of estimating job turnover. The most that can be said is that, if the project is successful and proceeds on schedule, an estimated 105 construction jobs will exist annually for 15 years. In other words, the duration of each construction job is 15 years. We cannot predict the occupancy of each such job by one or more occupants during that duration.

The point is made that the report estimates that at the end of the 15-year construction period there will be 390 permanent jobs earning an estimated \$3,637,600 annually. The conclusion then is drawn that, since the estimated annual wage in 1992 would be \$9,320, it would be well below Kauai's median household income. The comment further observes that inflation would put such wages even farther below the median income. Some of the wages of permanent employees undoubtedly will be below the median income in any given year. In every economy, some wages obviously are

Mr. Don Bremner  
July 19, 1976  
Page Four

below the median or there could be no median. In evaluating the equity of the wage structure of any enterprise, the test is not whether or not some wages are below the median. It is whether the wages are competitive for the skill and experience of the work classification.

Regarding the point about inflation, consistent with accepted economics practice, the entire analysis has been conducted in terms of constant dollars, on the assumption that, in an inflating economy, costs and revenues rise approximately the same. Hence, in practice, the wages shown for 1992 would not be those indicated in the EIS. Rather, they would be the estimated amount plus any additional amounts added by inflation. All other figures in the report would be similarly inflated.

#### Pages 20-21

The comment addresses the summary section reference to the fact that the economic impact is not limited to the jobs directly created by the development nor to the salaries paid for those jobs. Further explanation was requested for the statements that "a construction job creates 1.41 jobs throughout the county's economy, and a hotel-related job creates 1.20 jobs throughout the economy. The figures were derived by estimating the "multiplier effect" of the project's direct employment and were based on economic input-output tables developed for Kauai by the University of Hawaii's Center for Non-Metropolitan Planning and Development. A detailed explanation of the methodology used is contained in pages 148-169.

#### Pages 21-27

These comments related to the assessment of social impact and suggested that the EIS did not describe what the present social conditions are and that, as a consequence, the EIS has not properly assessed the potential social impact upon the area. It also was suggested that the subject section discussed economic and physical impact rather than actual social impact, and that there was no mention in the EIS of the residents and their characteristics.

In terms of data, the analysis presented substantial information regarding the local population, its ethnic composition, its employment, its income, and its housing patterns. I would take exception to the suggestion that analyses of job development, income generation, the development of retail stores for operation by local merchants, the expansion of housing opportunity, the generation or lack of generation of congestion, the widening of opportunities for cultural exchange, and the physical impact of a development upon the sensibilities and sense of place and space of local residents, do not comprise an assessment of social impacts. Such questions are at the heart of any evaluation of the social impact which a proposed development may have.

Mr. Don Bremner  
July 19, 1976  
Page Five

An economic impact is a social impact. Personal income generation clearly is related to adequate health care, adequate nutrition, reduced crime rates, family stability, population stability, the availability of cultural and educational opportunity, the overall ability to maintain a decent standard of living, and social mobility. The clear relationship is any area between unemployment, dependency on welfare, and negative social consequence is well-documented in a host of authoritative studies.

A physical impact is a social impact. Questions such as living densities, the effects of massive structures as opposed to light structures, the proliferation or dispersal of structures — all such questions were addressed by planners in terms of their social and psychological impacts on people long before they came to be considered in principally environmental/aesthetic terms.

It is of course true that an in-depth, academic study of Kauai society could generate much more extensive and detailed data from which a more elaborate analysis of social impacts could be produced. However, there is a practical limit to the scope which reasonably can be expected in a study of this kind. We feel that, within that limit, the EIS is responsive to the County's request regarding social impact assessment.

Pages 24-26

The comments regarding compatibility of existing Kauai lifestyles, interests, and values with those of the projected visitor population are important. I will respond to the major comments individually.

Comment: "We do not see how tourists and the existing Kauai residents can have mutual interests and values." We emphasized "development of a visitor population whose values are consistent with existing lifestyles." Nowhere did we intend to imply an identity of values through some process of homogenization. That would be not only impossible but undesirable. By "consistency of values," we meant to indicate simply that the values of the visitor population anticipated for the project — as measured by the motives of condominium buyers and extended guests — are such as to minimize intrusion upon the existing lifestyle. They are motivated to invest in a leisure time environment which is low key, nature-oriented, and largely devoid of the kind of massive entertainment facilities characterized by highly urbanized areas such as Waikiki. Consequently, it is unlikely that the project will attract many purchasers who desire to change the basic character of the area. And it is that basic character which provides both the physical and psychological environment within which present Kauai residents' interests and values are realized. In this context, I cannot agree with the comment that "although

Mr. Don Bremner  
July 19, 1976  
Page Six

it may be important to 'assess the characteristics' and 'motives' of tourists who visit a given area in order to determine their behavior and provide certain needs, such an assessment is totally meaningless to the potential social impacts upon the residents." To the contrary, the motives of large numbers of people coming into an area are highly relevant to the impact which they will have on local lifestyles and values.

The comment regarding the apparent inconsistency between the statement that the condominium owner and extended guest would be "motivated to participate in the existing lifestyle" and our emphasis upon the ability of the development to contain occupants on-site is well-taken. However, the intent of that language is clearer when it is read in context. "Participation in the existing lifestyle" was meant simply to refer to enjoyment of the existing ambience of the Poipu area, as distinct from a motivation to "intrude upon it or change it." "Respect" for the existing lifestyle would have been a better usage than "participation" in the existing lifestyle, a basic point of your comment in which I concur. I think it is clear that the less frequent travel of occupants off-site than would occur from developments with less elaborate recreation facilities is an important element — along with the basic motives of most buyers — in minimizing intrusion upon local values, interests, and lifestyles.

Page 28

The estimate that 40% of the households can afford the lowest priced lots includes consideration of construction costs. Your comment assumes that the lowest priced lots are estimated at \$7,300. In fact, they are estimated at \$5,000.

Page 29

The comment suggests that, although the proposed golf course provides a concept of open space, its development may in fact "exacerbate the need for more open space" because it will utilize land in a fashion which restricts it from "general recreation opportunities such as leisurely walking or picnicking." The land is wholly unsuited at present for such recreational activities, is not in fact used for such activities, and its general unsightly character in its present state make it extremely unlikely that it would ever be so used unless cleared and landscaped.

Page 29

Construction employment is estimated to remain fairly constant for 15 years. Jobs of that duration are not really "temporary" as suggested by the comment, although it is clear that there is a termination point. However, even though those jobs will end, we

Mr. Don Bremner  
July 19, 1976  
Page Seven

believe they still would result in a net reduction in unemployment and welfare payments since it is the intent of the developer to rely, to the extent possible, on local labor. The largest single category of present unemployment on Kauai is construction labor.

Page 31

The concern expressed regarding the relationship of tax base expansion to an endless cycle of growth is an important one. As you note, "Growth cannot proceed indefinitely in a finite area." The cycle, however, need not be an endless one. Whether it is or not depends largely on the sectors in which growth occurs. Our discussion of county finances dealt principally with expansion of the tax base as a means of eliminating the County's projected operating deficits. If growth is promoted in sectors in which incremental tax revenues exceed the incremental cost of public services, and if the new jobs are filled substantially by the existing local unemployed, an endless cycle of growth is not necessarily generated. Budgets can be balanced and economic growth can be achieved. But that need not mean an endless cycle of physical growth as implied by the comment.

Moreover, it should be noted that the economic effects of the development are not so much a function of growth per se as they are a function of a shift in the relative viability of economic sectors. The County's financial difficulties, as well as the area's unacceptably high unemployment, are in large part due to the decline of agriculture. While every effort should be made to maintain agriculture as a viable economic sector, it is clear that — even at existing population levels — other areas of the economy are going to have to be emphasized if adequate levels of public service are to be maintained and if adequate employment opportunities are to exist.

Page 57

The error of 0.1 percent in the table has been noted. I assume it is a matter of rounding. While the discrepancy does not materially affect any of the conclusions, we will check our source data and make the necessary adjustment.

Page 59

A number of comments were made relating to the estimates of numbers of Kauai residents who can afford lots and houses at given prices. Reference is made to page 60, and the comment made that "it is illustrated that each lot size will require a certain house size. The table on page 60 has nothing to do with either lot size or house size. While size may be a factor in the pricing of lots, much more important

Mr. Don Bremner  
July 19, 1976  
Page Eight

factors will be location and topographical quality. The showing of construction costs of houses rising as the assumed cost of lots rises is simply an illustration of the total housing costs which we estimate are affordable by the indicated number of Kauai households based on the practices of financial institutions. The table also reflects the fact that people tend to spend more on construction as the quality of lots rises. The table does not imply either lot sizes of "required" house sizes.

Another comment suggests that the number of households that we estimate will purchase lots may be misleading because (1) Kauai residents able to afford the larger lots and housing may well own their homes already, and (2) Kauai residents who can afford the smaller and hence cheaper housing may find them too small for their needs. In respect to the first point, Kauai has a housing turnover rate substantially lower than the rest of the state, a condition which is attributed largely to inadequate supply. It is expected that provision of additional quality housing would result in a larger turnover, with vacated units becoming reoccupied by maturing families with growing incomes. In any event, the estimates assume that most of the purchases by Kauai residents would be of the lowest priced lots. It is doubtful that many of even the least expensive and smallest homes would contain insufficient space to accommodate the average sized Kauai household, which -- as you point out -- consists of three people.

The construction of the single family houses can be undertaken either by contractors hired by the lot purchasers, by the owners themselves, or by Moana Corporation should it decide to offer contract construction services. As is pointed out in the report, we assume that many Kauai purchasers will reduce construction costs by providing labor themselves in such areas as finishing and landscaping. The only constraint upon the design and construction of individual homes will be that they comply with code and design standards.

Another comment requests clarification of what is included in "construction finishing." All of the illustrative items set forth in the comment can be included in that category. Obviously, there will be a wide divergence among purchasers as to which items they will personally take care of with their own labor. The construction cost estimates do not explicitly include or exclude any of such items. The cost estimates are derived from an analysis of what given numbers of Kauai households can afford at given income levels.

Page 61

The primary markets upon which the proposed project will depend for its success are the condominium second home purchaser market for sales, and the hotel-condominium visitor markets in Hawaii. The EIS does not state, nor was it intended to imply, that

Mr. Don Bremner  
July 19, 1976  
Page Nine

either the number of lots mentioned in your comment (200) or the kinds of condominiums mentioned in your comments (priced at \$75,750 to \$95,150) were likely to be purchased by Kauai residents. We did not estimate, as suggested, that 84% of the households could afford 200 of the lots. To the contrary, we estimated that 40% of the households could afford the lowest priced lots, with declining percentages being able to afford lots as their prices increased. Using this assumption combined with the housing market analysis we estimated that "perhaps 25-30% of the lots will be sold to Kauai residents." (Page 55) Thirty percent would be 90 lots.

In respect to your questioning of Kauai residents' ability to purchase condominiums, the comment assumes that \$75,750 will be the lowest priced unit because of our reference to the present Kiahuna units as "indicative of the quality, size, and cost/price structure of the units in the proposed Moana project." This reference obviously is confusing. While the existing Kiahuna development is illustrative of the aesthetics and quality that is planned for Moana's proposed project, the developer has advised us from the beginning of our work that the price range of the new condominiums likely will be lower than that of the existing ones (adjusting for interim inflation). This is because of the substantially lower value of non-ocean front land. While some of the project's condominiums may approach the top of the price range because of prime location, others undoubtedly will be priced substantially lower than their present Kiahuna equivalents. It is impossible to be more specific at this time about prices since planning has not yet proceeded to design and bids have not been received. However, we have been assured that the above statement is conceptually accurate.

Notwithstanding that response, I would agree with your comment that the mere fact that 75 multiple unit family units per year would be developed, and that the projected number represents 30% of the annual Kauai demand for multiple family units, does not mean that — as a practical matter — all such units would be affordable by households included in that annual demand.

In summary, you are correct in suggesting that the project's success is not merely "partially" dependent on tourism and absentee ownership of condominiums. It is primarily dependent on such factors. The overall report makes that very clear. Use of the word "partially" was not intended to convey an opposite impression, since it is obvious that the project concept is that of a destination resort. Nonetheless, within that concept, the estimated pricing structure represents a meaningful effort to contribute to a solution to the local housing problem. This is particularly true in respect to the lower priced lots, the cost of which in effect will be subsidized jointly by the developer and the purchasers of the higher priced lots.

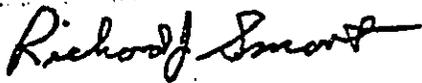
Mr. Don Bremner  
July 19, 1976  
Page Ten

Page 75

The discussion of the rental potential of the development was discussed in pages 61-70. (Particularly see Table III-19 for rental projections.) However, I would add that, based on our assessment of comparables, we would expect to see the project's occupancy rates exceed the average for the area once the recreational facilities are complete and assuming sound management. The completed project will offer elaborate and high quality recreational facilities in the island's most favorable weather area. This subjective opinion is dependent, of course, on Moana's execution of the project at the same level of quality which has characterized its existing developments.

Thank you for your comprehensive and well-directed comments. I hope these responses have been useful. As development planning proceeds, greater specificity as to some of the points you have raised will be possible, and I will be happy to provide your with additional information.

Yours very truly,



Richard J. Smart

cc: Mr. Brian Nishimoto  
Belt, Collins and Associates, Ltd.

July 15, 1976

Mrs. Jacquelin Miller  
Acting Director  
Environmental Center  
University of Hawaii  
Crawford 317  
2550 Campus Road  
Honolulu, Hawaii 96822

Dear Mrs. Miller:

The following is in response to comments made by the Environmental Center relating to "Part II - The Physical Impact of Kiahuna Golf Village" of the Environmental Impact Statement for the Kiahuna Golf Village.

o At present, a test well is being drilled east of Koloa Mill at the foot of the Haupu Ridge as an additional source to service the Koloa-Poipu General Plan area. This is being done under the auspices of DOWALD for the DLNR. Sometime in 1977, the new well may begin operation and pipe the water to a water storage tank to be located near the Keliweli Subdivision. The planned capacity will be about 1 million gallons. Moana Corporation is cooperating with the Department of Water Supply for source development. The present system is near capacity.

o We acknowledge that there is no mongoose on Kauai. Further biological and archaeological studies will be conducted prior to the initiation of construction.

o If a significant number of archaeological important sites are found on the project site which cannot be relocated, these sites will be set aside for historic preservation. This, in turn, would mean that development at the site could be reduced or altered. The alternative of a historic park for the entire site would require a great sum of money from the State to acquire this parcel of land. This would be at the expense of the goal of the General Plan for Kauai in which the Koloa-Poipu area is general planned as a major resort destination area. This, in turn, would negate any potential new revenue derived from the tourist industry as well as an increased tax base for the County and State.

We hope we have satisfactorily addressed your comments.

Sincerely yours,

  
Joseph Vierra, Jr.

SM:gk  
cc: Brian Nishimoto  
Robert Harmon

# University of Hawaii at Manoa

Water Resources Research Center

MEMORANDUM

June 18, 1976

MEMO TO: Planning Department  
County of Kauai  
Belt, Collins & Assoc.

FROM: Frank L. Peterson *f. Peterson for*  
Acting Asst. Director, WRRRC

SUBJECT: Review of EIS for Kiahuna Golf Village

Route to:	
Sell, R. A.	
Zell, J.	
Husta, P.	
Lyon, S. E.	
Fin, W.	
Ches, J.	
Wong, J. A.	
Col, R.	
Ph. Dept, M.	
Holter, L.	
Action by	
Description	
File. Job #	

Part I of this EIS, "The Economic and Social Impact of Kiahuna Golf Village," was not reviewed by WRRRC; however, Part II, "The Physical Impact of Kiahuna Golf Village," was reviewed by H. Gee and myself, and we offer the following comments and suggestions.

The following statements are made in reference to page 191 and page 217-225 concerning nutrient materials for cultivation and coastal water standards of Class AA waters. Samples of coastal waters taken off McBryde Farms at Wahiawa Bay and the McBryde mill showed that the standards for Class A waters were exceeded for the nitrogen standard of 0.15 mg/l as N and that the sample at Wahiawa Bay exceeded the phosphorus standard of 0.025 mg/l as P. (Page 160, The Quality of Coastal Waters: Second Annual Progress Report. WRRRC Tech Report No. 77, 1973.) It should be noted that the coastal waters off of McBryde farms are classified as A waters, not AA, and that the waters from Hoai Bay to Makahuena Point are classified as AA waters. This would include the Koloa sampling station for QCW as well as the waters off of the proposed Kiahuna Golf Village. A single sample taken during August 1972 at Koloa showed that the coastal waters approaches the maximum allowable limits for both nitrogen and phosphorus in AA waters. This sample was taken during a dry month when little runoff was in effect. During winter months when there is considerably runoff from Waikomo stream, the Class AA water standards will be exceeded. The EIS should consider the fact that nutrient introduction into coastal waters is primarily by surface runoff flowing into streams and then into the coastal waters or sheet runoff and that contribution by percolation and ground waters to be secondary. The EIS should also consider that coastal waters off of agricultural land is classified as A and off of the proposed project as AA and that the comparison of fertilization of golf course and landscaped land and sugarcane cultivation is not valid in this case since they enter two different classes of water.

In the discussion on Drainage and Flooding and Runoff on pages 236-238 and 270-271, two potential problems have not been adequately addressed. First, while provisions have been made to accommodate increased runoff on the project site, with diversion channels "A" and "B" no mention is made of

Page 2  
June 18, 1976

provisions for handling increased runoff makai of the project site (after the diversion channels empty into Waikomo Stream). Secondly, although the problem of increased runoff is discussed, no mention is made of the possible adverse effects of erosion and sedimentation which may occur as a result of modification in the surface runoff patterns, especially during the construction phase.

In the discussion of "Sewage and Solid Waste Generation," on p. 271, the following statement is made ". . . alternatives to the open dump are definitely needed for health as well as aesthetic reasons. Refer to the Infrastructure segment." However, examination of the Infrastructure section (pp. 232-240) shows absolutely no mention at all of any alternatives! Furthermore, in this same section (Domestic Water, pp. 232-235) reference is made to the development of an additional source of water, however, no discussion or data is provided to indicate the extent to which a proven additional source of water is available.

Finally, on p. 215 reference is made to the importation of some 171,940 cubic yards of topsoil from the Koloa area. If the source of this topsoil is not an already-developed borrow pit area, what will be the possible adverse effects on the borrow area, especially in terms of flooding and erosion of the removal of this volume of topsoil?

FLP:jmn

cc: H. Gee

JV J  
UH m  
Sam 1972  
file

July 14, 1976

Mr. Frank Peterson  
Water Resource Research Center  
University of Hawaii  
HIG 235  
Honolulu, Hawaii 96822

Dear Mr. Peterson:

Kiahuna Golf Course

We have received a copy of your June 18, 1976 memorandum regarding the review of the environmental impact statement for Kiahuna Golf Course, and submit as an attachment our response to your comments. Your comments and suggestions are well taken, and we hope that our response adequately address your concerns.

Please do not hesitate to contact me if you have further questions or additional information is desired.

Sincerely yours,



James R. Bell

LEH:kko

attachs.

cc: Planning Dept., County of Kauai  
Robert Harmon  
Mike Vance

Attachment 1

Responses to Kiahuna Golf Village Comments

U of H Water Resources Research Center

Nutrient Materials

Additional data has been gathered and collated by the State Department of Health for the area along Poipu Beach. Although it is true that the class of coastal waters directly off the McBryde Farm lands is Class A, the heavy irrigation and fertilization practices on the agricultural land have effected the Class AA waters from both rainfall runoff and percolation to groundwater flowing toward the ocean. In addition, currents provide a constant flux of water mixing along this coastline. Table 1 gives this additional data and demonstrates that the coastal water quality standards of Class AA for Poipu Beach are presently exceeded. As can be expected, runoff from the winter and spring rains tends to increase nutrient concentrations. Also, because there is a heavy growth of lettuce seaweed and high concentrations of Kjeldahl nitrogen (organic), it would seem to indicate there is possible cesspool seepage along the shoreline. (Note: Other than the Sheraton-Kauai and the Kiahuna Condominiums which use sewage treatment plants, other developments and residences use injection wells (lava tubes) and cesspools to take care of their sewage generation.)

An analysis of the impact on coastal waters due to runoff from the proposed development is presented in the following discussion. The projected increases in nearshore water concentration are calculated to be rather minimal. However, we realize that such models are only as accurate as the assumptions which are made. Major variables in this model are (1) the volume of the mixing

Table 1  
 Nitrogen and Phosphorus Level Along Poipu Beach, Kauai

<u>Sampling Station</u>	<u>Date</u>	<u>(mg/l)</u>	
		<u>Nitrogen</u>	<u>Phosphorus</u>
Waiohai Point	3/ 4/75	.09	.002
Brennecke Beach	3/ 4/75	.05	.006
		.54	.014
Between Brennecke Beach and Poipu Beach	3/ 4/75	.29	.012
		.06	.007
Poipu Beach	3/ 4/75	.02	.011
	4/ 8/75	.05	.007
	10/ 7/75	.14	Not Detectable
	1/13/76	.02	.011
	4/27/76	.17	.014

Source: Eugene Akazawa, State Department of Health, 7/3/76.

zone--if the model was assumed to be at a lesser depth or distance from the shore, then the projected concentrations would be higher; (2) the assumed ambient nitrogen concentration in the ocean waters will dictate the order-of magnitude of the projected nitrogen levels due to the large volume of ocean water as compared to the runoff contribution; and (3) that the nitrogen applications will be applied uniformly throughout the year.

Analysis of Storm Runoff Impact to Coastal Water: Most Probable Case

Assumptions:

- (a) Phosphorus relatively insoluble.
- (b) Potassium abundant in ocean environment.
- (c) Because of assumptions (a) and (b), nitrogen will be dealt with only.
- (d) Mixing zone 10-foot depth; 1,000 feet from shoreline;  
1.0 miles along the shore.

Calculations:

- (a) Volume of effective mixing zone

$$(10)(1,000)(5,280) = (5.28 \times 10^7) \text{ ft.}^3 \times (7.48) \text{ gal./ft.}^3$$

$$= 3.95 \times 10^8 \text{ gal.}$$

$$\text{Measured at Koloa} = .104 \text{ mg/l or } 8.68 \times 10^{-7} \text{ lb./gal.}$$

$$\text{Nitrogen} = (8.68 \times 10^{-7} \text{ lb./gal.})(3.95 \times 10^8 \text{ gal.})$$

$$= 342.9 \text{ lbs.}$$

- (b) Runoff = (.3) (Average Rainfall) - (.3) (45.6) = 13.7 in.

<u>Month</u>	<u>% of Total</u>	<u>Run-off (inches)<sup>1</sup></u>	<u>(10<sup>7</sup>) (Gal./Mo.) for + 483 acres</u>
January	15.7	2.15	2.83
February	12.4	1.70	2.23
March	11.7	1.60	2.09
April	6.6	0.90	1.18
May	3.7	0.51	.677
June	2.3	0.32	.425
July	3.0	0.41	.535
August	6.6	0.90	1.18
September	3.3	0.45	.598
October	8.4	1.15	1.51
November	12.4	1.70	2.23
December	<u>13.7</u>	<u>1.88</u>	2.47
Total	100	13.7	

<sup>1</sup>Taken from Station 940 Puuhi, "Monthly Probabilities of Different Rainfall Levels";  
Land Study Bureau, University of Hawaii; Technical Paper No. 4, June, 1961.

- (c) Assume existing runoff and percolate nutrient contributions to the near-shore ocean waters will be included in the measured ambient nitrogen concentration. (.104 mg/l).
- (d) Assume 10% of N applied becomes runoff.

Nitrogen applied to golf course	41,400 lb./year
Nitrogen applied to landscaping	<u>29,900</u>
Total	71,300 lb./year
10% as runoff	7,130 lb./year

Projected Nitrogen Runoff Per Month -- lbs.

January	1,119	July	214
February	884	August	471
March	834	September	235
April	471	October	599
May	264	November	884
June	164	December	977

- (e) Nearshore mixing zone, assume resultant current flux to be from northeast to southwest at 0.25 knots or 0.288 miles per hour.

1)  $\frac{1.0 \text{ mile section}}{0.288 \text{ miles/hr.}} = 3.47 \text{ hrs.}$

2)  $\frac{3.95 \times 10^8 \text{ gals.}}{3.47 \text{ hrs.}} = 24 \frac{\text{hrs.}}{\text{da.}} \times 30 \frac{\text{das.}}{\text{Month}}$

$= 819.59 \times 10^8 \frac{\text{gals.}}{\text{month}}$  or  $8.196 \times 10^{10} \text{ gal./month.}$

through the mixing zone.

- 3) If there is  $8.68 \times 10^{-7} \text{ lb./gal.}$  of N in these waters (.104 mg/l) then

$(8.196 \times 10^{10} \text{ gal./month}) (8.68 \times 10^{-7} \text{ lb./gal.})$   
 $= 71.14 \times 10^3 = 71,140 \text{ lb/month through the mixing zone.}$

# CORRECTION

THE PRECEDING DOCUMENT(S) HAS  
BEEN REPHOTOGRAPHED TO ASSURE  
LEGIBILITY  
SEE FRAME(S)  
IMMEDIATELY FOLLOWING

•enonolliw•

- (c) Assume existing runoff and percolate nutrient contributions to the near-shore ocean waters will be included in the measured ambient nitrogen concentration. (.104 mg/l).
- (d) Assume 10% of N applied becomes runoff.

Nitrogen applied to golf course	41,400 lb./year
Nitrogen applied to landscaping	<u>29,900</u>
Total	71,300 lb./year
10% as runoff	7,130 lb./year

Projected Nitrogen Runoff Per Month -- lbs.

January	1,119	July	214
February	884	August	471
March	834	September	235
April	471	October	599
May	264	November	884
June	164	December	977

- (e) Nearshore mixing zone, assume resultant current flux to be from northeast to southwest at 0.25 knots or 0.288 miles per hour.

1)  $\frac{1.0 \text{ mile section}}{0.288 \text{ miles/hr.}} = 3.47 \text{ hrs.}$

2)  $\frac{3.95 \times 10^8 \text{ gals.}}{3.47 \text{ hrs.}} = \frac{24 \text{ hrs.}}{\text{da.}} \times \frac{30 \text{ das.}}{\text{Month}}$

$= 819.59 \times 10^8 \frac{\text{gals.}}{\text{month}}$  or  $8.196 \times 10^{10} \text{ gal./month.}$

through the mixing zone.

- 3) If there is  $8.68 \times 10^{-7} \text{ lb./gal.}$  of N in these waters (.104 mg/l) then

$(8.196 \times 10^{10} \text{ gal./month}) (8.68 \times 10^{-7} \text{ lb./gal.})$

$= 71.14 \times 10^3 = 71,140 \text{ lb/month}$  through the mixing zone.

Calculation of New Nitrogen Concentration Due to Storm Water Runoff  
in the Nearshore Waters of the Koloa-Poipu Area

Month	Existing Flux (gal/mo)	Ocean Existing N (lb/mo)	Runoff Flow (10 <sup>7</sup> )(gal/mo)	N Runoff (lb/mo)	Total Water (10 <sup>7</sup> )(gal/mo)	Total N(lb/mo)	New N Concentration lb/gal(10 <sup>7</sup> ) mg/l
Jan.	8,196 x 10 <sup>7</sup>	71,140	2.83 x 10 <sup>7</sup>	1119	8,198.83	72,259	8.809 .1055
Feb.			2.23	884	8,198.23	72,024	8.785 .1053
Mar.			2.09	834	8,198.09	71,974	8.779 .1052
Apr.			1.18	471	8,197.18	71,611	8.736 .1047
May			.677	264	8,196.68	71,404	8.711 .1044
June			.425	164	8,196.43	71,304	8.699 .1043
July			.535	214	8,196.54	71,354	8.705 .1043
Aug.			1.18	471	8,197.18	71,611	8.736 .1047
Sept.			.598	235	8,196.60	71,375	8.708 .1044
Oct.			1.51	599	8,197.51	71,739	8.751 .1049
Nov.			2.23	884	8,198.23	72,024	8.785 .1053
Dec.			2.47	977	8,198.47	72,117	8.796 .1054

12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Diversion Channels

Diversion channels "A" and "B" as proposed for the development implements a portion of the County's drainage general plan concept for the Koloa-Poipu region (General Plan--Water, Sewerage and Drainage; County of Hawaii; by Sunn, Low, Tom and Hara; August, 1963). The primary purpose of the channels is to divert the sheet runoff from the lands between Koloa and Poipu that now ponds at the low lying areas along the old Poipu Road. The flood problems of the Poipu Beach area are well documented. Channels "A" and "B" will significantly reduce the amount of runoff reaching the flood prone areas. The diverted waters will be discharged into Waikomo Stream for eventual release into the sea.

The 50- and 100-year recurrence interval peak discharge rates of Channels "A" and "B" based on the County of Kauai Storm Drainage Standards are as follows:

Table 2: Channels "A" and "B" Discharges

Channel	Tributary Area	Peak Discharge Rate	
		50-Year	100-Year
"A"	345 acres	1,200 cfs	1,700 cfs
"A" w/extension	1,022 acres	3,400 cfs	4,700 cfs
"B"	165 acres	600 cfs	800 cfs

Waikomo Stream Hydraulics

The increase to the Waikomo basin area by Channels "A" and "B" is small, from 10.4 to 11.2 square miles. The effect on the Waikomo Stream peak peak discharge rates is even less significant. The following table shows the actual increase to the Waikomo Stream peak discharge rates for storms of various frequencies based on the County's Storm Drainage Standards.

Table 3: Waikomo Stream Discharge

<u>Drainage Basin</u>	<u>Area (Square Miles)</u>	<u>Peak Discharge Rates</u>	
		<u>50-Year</u>	<u>100-Year</u>
Existing	10.4	13,000 cfs	20,800 cfs
With Channels "A" and "B"	11.2	13,600 cfs	21,600 cfs
With Channels "A", "B" and "A Extension"	12.0	14,200 cfs	22,800 cfs

The project proposes to construct Channels "A" and "B". The extension of Channel "A" is to be implemented as part of the County General Plan. The increase to the Waikomo Stream flow is 600 cfs or 4.6% for the 50-year storm and 800 cfs or 3.8% for the 100-year storm.

The U.S. Army Corps of Engineers and other government agencies have done several studies of the Waikomo River basin. The Corps of Engineers standard project flood discharge for the lower reaches of the stream is 26,400 cfs. Its 10-year, 50-year and 100-year frequency floods are 9,900; 15,700; and 18,200 cfs respectively. The Corps estimates the capacity of the two Waikomo Stream culverts at Poipu Road to be 7,000 cfs. This is less than the 10-year frequency flood of 9,900 cfs. Therefore, any unusual storm may cause the overtopping of the stream banks and flooding of adjacent lands to occur.

The Flood Insurance Study, Type 15: Koloa-Poipu Vicinity, Kauai, Hawaii,  
by R.M. Towill for the Federal Insurance Administration, defines the Waikomo Stream water profile and inundation limits for the 100-year frequency flood. The criteria used in the study is based largely on the Corps of Engineers data and discharge rates. The attached Plate 13 from the report shows the flood water surface profile for the 10-year, 100-year and the standard project floods. The difference between the standard project flood ( $Q = 26,400$  cfs) and the 100-year flood ( $Q = 18,200$  cfs) is about one foot. Therefore, using the 800 cfs increase (100-year flow, Table 1) to Waikomo Stream by Channels "A" and "B" for a generalized comparison, the increase to the flood level should be less than a quarter foot, depending upon variations in the stream cross-sectional areas and floodway widths. Plotting of several cross-sections verified this.

The R.M. Towill study assumes that the fringe area between the floodway where actual flow movement occurs and the outer flood water limits have no storage capacity or flow. This is a conservative assumption. Therefore, the effects of Channels "A" and "B" on Waikomo Stream in relation to the limits shown in the R.M. Towill study should be negligible.

In conclusion, the existing Waikomo Stream cross-sectional area and culvert/bridge crossings are inadequate for design discharges established by the County and Corps of Engineers. Channels "A" and "B" will divert additional runoff to the Waikomo Stream floodway; however, review of the R.M. Towill study shows that the effect should be negligible.

Channels "A" and "B" will be a definite benefit to the now flood prone areas along Poipu Beach Road.

#### Solid Waste

The comment that was made on pg. 271 with regard to solid waste was offered as "food-for-thought". However, the County of Kauai is the organization responsible for the maintenance of this open dump and, as such, would be responsible for all improvements of this facility. It is not within the realm of this EIS to dictate County policy. We recognize and regret the confusion generated by our comment.

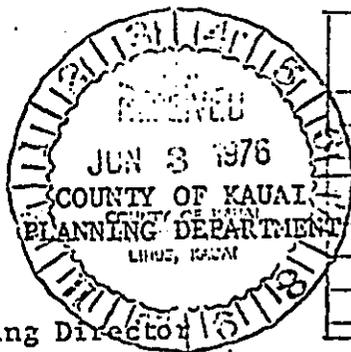
#### Domestic Water Source

A well is to be drilled in 1976 for the purpose of implementing the present system. This water is proposed to be piped to a storage tank near the Weliweli Subdivision. Its capacity will be from 0.5 to 1.0 million gallons and is expected to serve the Koloa-Poipu planning area.

#### Top Soil Source

The location of the borrow pit for fill material is not yet known and will be dependent upon what organization is contracted with to do the site preparation. However, all grading and fill removal procedures will be in compliance with Ordinance 262--the Kauai Grading Ordinance to avoid any adverse impacts.

Belt, Collins and Associates  
Honolulu, Hawaii  
July 14, 1976



FROM: Brian Nishimoto, Planning Director DATE: May 28, 1976

SUBJECT: General Plan Amendment, GPA-76-6; Moana Corporation

TO:  Public Works Dept.  
 Water Dept.  
 State Health Dept.  
 State Highways Division  
 Fire Dept.  
 Economic Development Office  
 Kauai Electric Co.  
 Sam Lee (DLNR)  
 State Dept. of Agriculture  
 State Dept. of Taxation, Real Property Division

FOR YOUR COMMENTS (pertaining to your department):

FINDINGS:

1. The subject area abuts Poipu Road which has a right-of-way width according to the tax map of approximately 120 feet and a pavement width of approximately 20 feet.
2. Portion of the subject lands will be within the 100 year inundation limits of the Waikomo Stream. The inundation limits are shown in the Flood Hazard Report for the Koloa-Poipu Area and have been completed by the U. S. Corps of Engineers. It is suggested that these areas be left open or as a golf course area. Further, it is suggested that no residential or non-residential structures be constructed within this area.

Signature *Alan Joseph*

Please return one (1) copy by May 11, 1976. Thank you.

July 15, 1976

Mr. Akira Fujita  
County Engineer  
Department of Public Works  
P.O. Box 111  
Lihue, Kauai, Hawaii 96766

Dear Mr. Fujita:

Kiahuna Golf Village

This letter is in response to your comments made on May 28, 1976, with regards to "Part II -- The Physical Impact of Kiahuna Golf Village" of the Kiahuna Golf Village Environmental Impact Statement.

On Figure 7, page 234, the proposed infrastructure plan is shown with the limits of the 100-year flood. Within these limits no building construction will occur and the major usage in this area will be open space and golf course.

Response to your letter of July 7, 1976, will be forthcoming.

If there are any further questions, please contact us.

Sincerely yours,

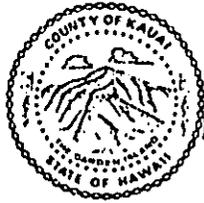


Joseph Vierra, Jr.

JV:kko

cc: Brian Nishimoto  
Robert Harmon

EDUARDO E. MALAPIT  
Mayor



RECEIVED

JUL 9 1976

BELT, COLLINS & ASSOCIATES, LTD.

AKIRA FUJITA  
County Engineer  
Telephone 245-3318

HENRY MORITA  
Dep. County Engineer  
Telephone 245-3602

COUNTY OF KAUAI  
DEPARTMENT OF PUBLIC WORKS  
4396 RICE STREET  
LIHUE, KAUAI, HAWAII 96766

July 7, 1976

Mr. Brian Nishimoto Director  
Planning Department  
County of Kauai  
Lihue, Hawaii 96766

Dear Brian:

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR KIAHUNA GOLF VILLAGE

We have reviewed subject environmental impact statement and offer the following comments:

1. Moana Development proposes to construct an amphi-theater adjacent to Weliwell Subdivision. Noise may become a nuisance for those residences close to the theater. The noise factor should be checked out before the outdoor theater is developed.
2. Moana proposes to expand the sewerage facilities within the existing STP site to handle the additional flows from the proposed development. It should be noted that when the County discussed a sub-regional sewerage system for the area, we understood that a 250,000 gpd plant was to be constructed at the site.

Further, as previously discussed with the developers of the sub-region, it is intended that when a regional public system becomes available, the existing facilities are to be abandoned and connection be made to the public system. With that understanding, the County has said that it would provide personnel to operate the plant. Since the flows from the original sub-region and the proposed development will be sizeable, the developer(s) and the County should discuss ways and means to implement the initial increment of the Koloa-Poipu Regional Sewerage System, rather than expanding on the original sub-regional system.

3. The report list projected lot prices of \$5,000 and up and the cost of a home at \$25,000 and up. These prices seem very unrealistic, especially for development around a golf course.

Route to:	
<input type="checkbox"/> Belt, R. M.	
<input checked="" type="checkbox"/> Bell, J.	<i>JWB</i>
<input checked="" type="checkbox"/> Hirota, P.	
<input type="checkbox"/> Lyon, F. E.	
<input type="checkbox"/> Ng, W.	
<input checked="" type="checkbox"/> Vierra, J.	
<input type="checkbox"/> Wallrahenstein, P.	
<input type="checkbox"/> Cain, R.	
<input type="checkbox"/> Hasterl, M.	
<input checked="" type="checkbox"/> Helber, L.	
Action by _____	
Description _____	
File. Job # _____	

COPY

July 7, 1976

4. In arriving at the cumulative net revenues for the 20-year design period, the report does not consider increased cost of highway and roadway maintenance and possible roadway improvements that the County may have to undertake as a result of increased traffic. Further, should the roadways within the development be turned over to the County, additional maintenance cost would be incurred. We believe, some costs should be included in your economic analyses for the project.
5. The report lists mongoose as a common mammal found in the Poipu area. Mongoose are not known to inhabit the island of Kauai.
6. Moana proposes to divert storm waters to Waikomo Stream via Diversion Channels "A" and "B". The report should discuss solutions to the anticipated flooding problems that will be caused by the diversions.
- ✓7. No mention is made in the report on the disposal of grubbed material during construction. The Koloa Open Dump nor any of the County's other dumps can handle the volume of grubbed material expected from a development of this size.

Thank you for the opportunity to comment on the EIS. We feel that this is a viable project and we endorse the development.

Very truly yours,



AKIRA FUJITA  
County Engineer

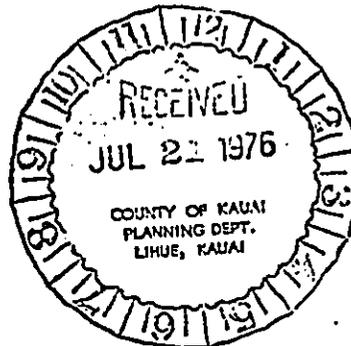
KM:mmm

/cc: Belt, Collins

Richard J. Smart  
1845 Leavenworth Street  
San Francisco, California 94109  
(415) 771-6200

July 19, 1976

Mr. Akira Fujita  
County Engineer  
Department of Public Works  
County of Kauai  
4396 Rice Street  
Lihue, Hawaii 96766



NOTED:

Subject: Environmental Impact Statement for Kiahuna Golf Village

Dear Mr. Fujita:

I have been asked by Moana Corporation to respond to your letter of comments of July 7, 1976 relating to the above-referenced Environmental Impact Statement. Since I was responsible only for the portion of the EIS relating to economic and social impacts, I will limit my response to the points in your letter which relate to those areas of inquiry:

Comment: "The report lists projected lot prices of \$5,000 and up and the cost of a home at \$25,000 and up. These prices seem very unrealistic, especially for development around a golf course."

The lot prices you referred to are for the lowest priced lots. The range of prices likely will include lots at \$15,000 and over. The overall financial planning for the project is based on a price structure for condominiums and lots which, taken as a whole, will result in a financially viable project. However, it is clear that the lowest priced lots not only do not include a profit, their estimated prices very likely are lower than their actual development costs. Hence, in that sense, you are quite right in calling them "unrealistic."

However, the developer has made an explicit decision that, in order to provide an opportunity for moderately priced local housing, Moana Corporation and the purchasers of higher priced lots will, in effect, jointly subsidize the cost of the low priced lots.

The estimated construction costs of the single family units on the low priced lots is more problematical. The estimates were based on the analysis of our housing market analyst and contained an assumption that much of the work on these units would not be provided by conventional contract labor:

Mr. Akira Fujita  
July 19, 1976  
Page Two

"A rather low construction cost factor has been utilized on the basis that owners will provide much of the labor for construction finishing and landscaping. This assumption is reasonable inasmuch as it is customary on Kauai for the owner and family and friends to provide a significant portion of the necessary labor."

The cost estimates for construction of units on the low priced lots clearly are unrealistic if this assumption turns out to be unjustified. Even with the assumption, construction costs may be higher for some of the buyers of the low priced lots since the degree of owner participation in "finishing" work will vary widely among the purchasers. However, regardless of the actual construction costs which develop for units on these lots, depending on the degree of use of non-contract labor by owner-occupants, it is clear that the subsidized lot prices afford an opportunity for local housing which does not exist elsewhere in the county in a project of comparable quality. Local residents will continue to build new houses someplace as indicated in the market data. While material and contract labor costs are functions of the general economy, are not within the control of the homebuilder, and hence could go substantially higher, the lot prices provide a basis for a total cost level for moderate income quality housing below that which is generally available in Kauai.

Finally, a general caveat should be noted. All of the prices are preliminary estimates. The actual pricing structure for the development could vary substantially depending on the state of the economy in general and the construction industry in particular. However, according to the developer, what will not change materially is the commitment to maintain a price range for lots which provides, in the indicated numbers, lots priced proportionately lower than the higher priced lots, as indicated in the report, for moderate income purchasers.

Comment: "In arriving at the cumulative net revenues for the 20-year design period, the report does not consider increased cost of highway and roadway maintenance and possible roadway improvements that the County may have to undertake as a result of increased traffic. Further, should the roadways within the development be turned over to the County, additional maintenance cost would be incurred. We believe, some costs should be included in your economic analyses for the project."

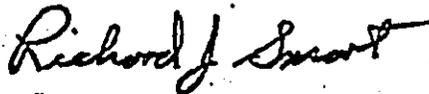
The developer does not intend to turn the roadways within the development over to the County. Hence, there will be no increased costs to the County associated with on-site roads. The point about possible increased roadway maintenance costs outside of the development associated with increased traffic is a good one. We do not have the data or the required experience to determine such costs. However, County or State

Mr. Akira Fujita  
July 19, 1976  
Page Three

engineers should be able to estimate such costs by applying their maintenance cost experience to our traffic projections. The resulting computation should then be applied to reduce the net economic benefit to the County by the appropriate amount. Considering the large economic benefit which is projected, I would assume that the benefit reduction would be relatively minor.

Thank you for your comments. Please let me know if you need further information.

Yours very truly,



Richard J. Smart

cc: Mr. Brian Nishimoto  
Belt, Collins and Associates, Ltd.

LE 11  
JRB

July 16, 1976

Mr. Akira Fujita  
County Engineer  
Department of Public Works  
County of Kauai  
4396 Rice Street  
Lihue, Kauai, Hawaii 96766

Dear Mr. Fujita:

Kiahuna Golf Village

This letter is in response to your comments on "Part II - The Physical Impact of Kiahuna Golf Village" of the Environmental Impact Statement for Kiahuna Golf Village made on July 7, 1976.

1. The proposed amphitheater and its potential functions will be in compliance with Public Health Regulation - Chapter 44B, "Community Noise Control for Oahu".

2. The proposal by the Moana Corporation to expand the existing sewage treatment system was made because the present site had been allocated for this specific purpose. Past experience has shown that the construction of a public facility often does not coincide with the timing of development construction, therefore it is felt that it is appropriate that this site be designated for the sewage treatment facility. If the County wishes to implement a regional system, Moana Corporation would be willing to take part in such a discussion along with other developers who would be effected.

3. The fact that mongoose is not found on Kauai is acknowledged.

4. The following is a discussion of drainage and flooding, due to the proposed development.

Waikomo Stream Discharge

<u>Drainage Basin</u>	<u>Area (Square Miles)</u>	<u>Peak Discharge Rates</u>	
		<u>50-Year</u>	<u>100-Year</u>
Existing	10.4	13,000 cfs	20,800 cfs
With Channels "A" and "B"	11.2	13,600 cfs	21,600 cfs
With Channels "A", "B" and "A Extension"	12.0	14,200 cfs	22,800 cfs

July 16, 1976

The project proposes to construct Channels "A" and "B". The extension of Channel "A" is to be implemented as part of the County General Plan. The increase to the Waikomo Stream flow is 600 cfs or 4.6% for the 50-year storm and 800 cfs or 3.8% for the 100-year storm.

The U.S. Army Corps of Engineers and other government agencies have done several studies of the Waikomo River basin. The Corps of Engineers standard project flood discharge for the lower reaches of the stream is 26,400 cfs. Its 10-year, 50-year and 100-year frequency floods are 9,900; 15,700; and 18,200 cfs respectively. The Corps estimates the capacity of the two Waikomo Stream culverts at Poipu Road to be 7,000 cfs. This is less than the 10-year frequency flood of 9,900 cfs. Therefore, any unusual storm may cause the overtopping of the stream banks and flooding of adjacent lands to occur.

The Flood Insurance Study, Type 15: Koloa-Poipu Vicinity, Kauai, Hawaii, by R.M. Towill for the Federal Insurance Administration, defines the Waikomo Stream water profile and inundation limits for the 100-year frequency flood. The criteria used in the study is based largely on the Corps of Engineers data and discharge rates. The attached Plate 13 from the report shows the flood water surface profile for the 10-year, 100-year and the standard project floods. The difference between the standard project flood ( $Q = 26,400$  cfs) and the 100-year flood ( $Q = 18,200$  cfs) is about one foot. Therefore, using the 800 cfs increase (100-year flow, Table 1) to Waikomo Stream by Channels "A" and "B" for a generalized comparison, the increase to the flood level should be less than a quarter foot, depending upon variations in the stream cross-sectional areas and floodway widths. Plotting of several cross-sections verified this.

The R.M. Towill study assumes that the fringe area between the floodway where actual flow movement occurs and the outer flood water limits have no storage capacity or flow. This is a conservative assumption. Therefore, the effects of Channels "A" and "B" on Waikomo Stream in relation to the limits shown in the R.M. Towill study should be negligible.

In conclusion, the existing Waikomo Stream cross-sectional area and culvert/bridge crossings are inadequate for design discharges established by the County and Corps of Engineers. Channels "A" and "B" will divert additional runoff to the Waikomo Stream floodway; however, review of the R.M. Towill study shows that the effect should be negligible.

Channels "A" and "B" will be a definite benefit to the now flood prone areas along Poipu Beach Road.

Mr. Akira Fujita

- 3 -

July 16, 1976

5. The grubbed material will be disposed in accordance with the State of Hawaii, Department of Health regulations. Because the project is to be built incrementally over 15 years, disposal of this material is not expected to be beyond the capability of the existing facilities. However, if this does become the case, then a variance would be applied for from the Department of Health, in order that the remaining amount can be burned at some remote site. Other grubbing removal techniques may be available upon initiation of site preparation.

If there are any further questions, please contact us.

Sincerely yours,

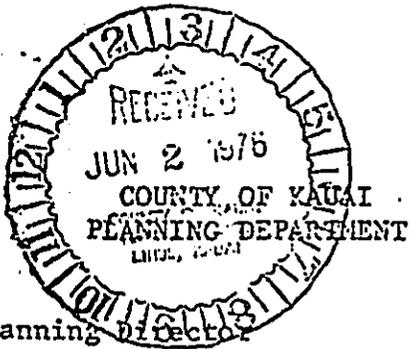


Joseph Vierra, Jr.

JV:kko

encs.

cc: Brian Nishimoto  
Robert Harmon



FROM: Brian Nishimoto, Planning Director

DATE: May 28, 1976

SUBJECT: General Plan Amendment, GPA-76-6; Moana Corporation

TO: (XX) Public Works Dept.  
(XX) Water Dept.  
(XX) State Health Dept.  
( ) State Highways Division  
(XX) Fire Dept.  
(XX) Economic Development Office  
( ) Kauai Electric Co.  
( ) Sam Lee (DLNR)  
(XX) State Dept. of Agriculture  
(XX) State Dept. of Taxation, Real Property Division

FOR YOUR COMMENTS (pertaining to your department):

*Provide Hydrants properly gaged, with  
sufficient fire flow to meet the need  
for the development in that area.*

Signature

Please return one (1) copy by May 11, 1976. Thank you.

July 15, 1976

Mr. Frank Rita  
Fire Department  
County of Kauai  
4223 Rice Street  
Lihue, Kauai, Hawaii 96766

Dear Mr. Rita:

Kiahuna Golf Village

This letter is in response to your concerns about "Part II - The Physical Impact of Kiahuna Golf Village" of the Kiahuna Golf Village Environmental Impact Statement. The placement of fire hydrants, and appropriate water pressure requirements will be in compliance with the County of Kauai, Board of Water Supply Standard Specifications for Waterworks Construction.

If there are any further questions, please contact us.

Sincerely yours,



Joseph Vierra, Jr.

JV:kko

cc: Brian Nishimoto  
Robert Harmon

EDUARDO E. MALAPIT  
MAYOR



RECEIVED

JUL 23 1976

BELT, COLLINS & ASSOCIATES, LTD.

BRIAN K. NISHIMOTO

PLANNING DIRECTOR

Route to:	
<input type="checkbox"/> Belt, R. M.	_____
<input checked="" type="checkbox"/> Bell, J.	_____
<input type="checkbox"/> Hirota, P.	_____
<input type="checkbox"/> Lyon, F. E.	_____
<input type="checkbox"/> Ng, W.	_____
<input type="checkbox"/> Vierra, J.	_____
<input type="checkbox"/> Wallrobenstein, P.	_____
<input type="checkbox"/> Cain, R.	_____
<input type="checkbox"/> Hastert, M.	_____
<input checked="" type="checkbox"/> Helber, L.	_____
Action by _____	_____
Description _____	_____
File # _____	_____

COUNTY OF KAUAI  
PLANNING DEPARTMENT  
4280 RICE STREET  
LIHUE, KAUAI, HAWAII 96766

July 15, 1976

Mr. Robert L. Harmon  
Moana Development Corp.  
451 Jackson Street  
San Fran., Ca. 94111

Subject: Comments and Evaluation on Kiahuna Golf Village Environmental Impact Statement ( Draft) During Review Period

In compliance with the provisions of Hawaii's Environmental Quality Commission's Rules and Regulations which prescribe Review of EIS, we are sending copies of all comments received during the 30-day review period which ended July 8, 1976.

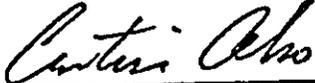
This office is evaluating the draft EIS. Presently we have several concerns which are listed as follows.

1. Although mention is made of a future major road from Koloa to Poipu along the Knudsen Trusts-State of Hawaii property boundary for improved regional circulation (p. 202), the proposed amphitheatre is located where the future road may intersect with Poipu Road. Also, a buffer zone may be necessary to insure the road's compatibility with abutting State Weliweli subdivisions and with planned Kiahuna residential zones.
2. Poipu Road, a collector road, possesses a pavement width of 20 feet. Because County standards presently require a 24-foot width, the inconsistency should be recognized.
3. The impact of the completed project on existing recreational areas in Poipu, particularly the finite shoreline, is anticipated to be significant. The project's generated visitor and resident population will increase usage of the limited beach areas fronting the public park and hotels. This should be adequately covered in the recreational element of the EIS.

Mr. Robert L. Harmon  
July 15, 1976  
Page 2

4. It appears a project the size of Moana's will represent much more than 2.5% of Kauai's visitor population (non-resident population). The methodology and its basis on p. 70 would be more correct if westbound totals rather than westbound plus eastbound totals were used, because eastbound visitors do not remain on Kauai as long or as frequently as do westbound tourists.
5. The subdivision application fee per created lot is \$3.00 on Kauai. Zoning permit fees are assessed prior to actual construction on property and are dependent on the nature and magnitude of construction.
6. 6000 square feet is mentioned as a lot size category for proposed single family dwellings. At sales prices listed on p. 54, \$5000 to \$7500 per lot, we cannot comprehend such lot sizes (p. 54 does not list the anticipated lot sizes relative to lot sales prices). If sizes below the County 6000 square foot minimum average were considered, with the more expensive, larger lots balancing out the sub-6000 square foot lots to meet the County minimum average, the discussion should take place within the EIS.
7. Page 160 affords an idea of the proportion of local employees provided jobs by the project. Does the category local employees include persons who recently migrated to Kauai to establish residency and employed by Kiahuna? Local residents on Kauai are quick to distinguish "malihinis", persons who have recently moved to the island, from "kamaainas", the long-term resident who has assimilated or developed an understanding for local culture and lifestyles.
8. Generally, the McDonald & Smart portion of the EIS says Kiahuna Golf Village should fit smoothly into the community primarily because of social opportunity from economic impacts, and Belt, Collins, Ltd. warns of potential conflict between the new population and the local population. These messages may contain different implications. The document, when considered as a whole, should be a coherent one.

  
GREGORY A. KAMM  
Planner

  
CURTISS AKO  
Planner

Enclosure

cc: Attn. Larry Helber  
Belt, Collins & Asso.

Richard J. Smart  
1845 Leavenworth Street  
San Francisco, California 94109  
(415) 771-6200

July 19, 1976

Mr. Brian K. Nishimoto  
Planning Director  
Planning Department  
County of Kauai  
4280 Rice Street  
Lihue, Kauai, Hawaii 96766

Subject: Comments and Evaluation on Kiahuna Golf Village Environmental Impact Statement

Dear Mr. Nishimoto:

This is in response to Mr. Gregory A. Kamm's and Mr. Curtiss Ako's letter to Mr. Robert Harmon dated July 15, 1976 in regard to the above-referenced Environmental Impact Statement. As the consultant responsible for the economic and social impact portion of the EIS, the developer has asked me to respond to those comments which related to our work. The following numbered paragraphs are responsive to those paragraphs with the same numbers in the Planning Department's letter which commented on our portion of the document.

3. Although Belt, Collins is responding to this comment, I think it appropriate that I do also, since our experience in analyzing the behavior of occupants of recreation oriented communities may shed some light on the question. As you point out, usage of the beach areas fronting the hotels and public park undoubtedly will be significantly increased by the proposed development. It is impossible to estimate with precision the actual size of that increase, but I think that certain assumptions can be made with confidence which will provide the basis for an assessment of the general magnitude of the problem.

While beach usage will increase significantly, it is clear that the volume of the increase at any given time will not come close to being a direct extension of the resident and visitor population generated by the project. It is anticipated that most non-resident buyers of condominiums, and virtually all vacation renters, will be choosing the location of their occupancy as a result of their primary recreational interests. They will choose to locate in the new project because their primary recreational interests are tennis or golf.

Mr. Brian K. Nishimoto  
July 19, 1976  
Page Two

While this will be generally true of condominium buyers, it will be even more true of renters. There will be some buyers whose primary recreational interest will be beach oriented, but who nonetheless will purchase property in the new development because of the exhaustion of the supply of beach oriented units. However, it is anticipated that a heavy preponderance of vacation renters will select the new site specifically because their primary interest is tennis or golf. This assumption seems sound, since such renters will have the option of renting at either location and their choice would be indicative of their primary motivation. Moreover, Moana intends to promote vacation rentals in the new development around the central idea of a golf/tennis community. Hence, those who respond to such a promotional idea would be expected to be responding explicitly to the primary appeal of golf and tennis.

This is not to say that visitors who are so motivated would not visit the beach for sunbathing, swimming, surfing, and snorkeling. They undoubtedly will. But I think it is fair to assume that such visits would be occasional and that the pattern of their recreational activities would be heavily oriented toward the community mauka of Poipu Road. It also is likely that this pattern will be reinforced by the existence of swimming facilities in the development.

The estimated average population of the proposed development, including both residents and visitors, is 2,688. If one assumes that 25% of the population would use the beach on any given day, the number would be 672. That number of beach users in turn will be spread throughout the day. Assuming an 8-hour beach day and an average visit of two hours, that would indicate an average number of 168 people from the new population on the beach at any one time. In sum, under this speculative analysis, it is assumed that one-quarter of the population would use the beach on a given day and that one-quarter of that number, on the average, would be on the beach at one time. This analysis is not based on any empirical knowledge, but I think the assumptions are reasonable. If one wanted to vary one of the assumptions, and assume that 50% of the population would use the beach on a given day (which I believe is doubtful), the number during any assumed two-hour period would be 336.

4. You noted that it would appear that a project the size of Moana would represent much more than 2.5% of Kauai's visitor population. The language in the text on page 70 to that effect is an inadvertent misstatement. Table III-19, which immediately follows the statement on page 70, shows the percentages estimated to be accommodated by the development through the development period, reflecting

Mr. Brian K. Nishimoto  
July 19, 1976  
Page Three

incremental development stages and hence incremental occupancy. The correct statement is that the Moana development is estimated to accommodate 2.15% of the visitor population in 1978. By 1995 it would accommodate 17.95%, assuming no other developments.

5. We note this comment and appreciate the information.
6. The exact mix of lot sizes has not been determined, since the developer has not yet specifically designed and sited the lots. This will be accomplished during detailed site planning should the General Plan Amendment be approved. The County will have an opportunity to review the specific sizes and siting of lots at that time. The developer has assured us that lot sizes will comply with County standards.

It should also be noted that, while size will be a factor in pricing lots, much more important factors are location and topographical quality. Although an averaging process will take place, larger lots will not be used, through such a process, to achieve the development of only marginally acceptable small lots which, when considered by themselves, would not reflect responsible development.

7. As indicated at the public meeting, the developer is committed to maximum employment of kamaainas. However, there are certain constraints over which the developer has no control, such as laws prohibiting employment discrimination and union requirements in respect to certain job classifications. Within those constraints, the developer will make every effort to employ long-term residents. If the County can suggest a practical program which, within the constraints of legal and union requirements, can result in the employment of more kamaainas than otherwise would be the case, the developer will be happy to work jointly with the County in its implementation. The objective is as worthwhile to the developer as it is to the local residents, since maximum contribution to the welfare of the community is essential to the success of this kind of project.
8. I assume that Belt, Collins also is responding to this comment. Several commentators have noted this apparent discrepancy between our assessment that the development is compatible with local values, interests, and lifestyles, and Belt, Collins' appropriate caveat to the effect that there could be potential conflict between the new population and the local population. However, I think the conflict is more apparent than real.

Mr. Brian K. Nishimoto  
July 19, 1976  
Page Four

Belt, Collins' point — in which I totally concur — was that "Unless efforts are made on both sides to understand the thinking of the other, and to promote interaction, there may be a potential of polarization and friction which would be undesirable in a resort destination area. The key to this problem will have to be understanding and cooperation for a cohesive new community."

Our emphasis was two-fold. The first point was that the general character of the development was such that it would tend to minimize disruption of local values and interests and minimize intrusion upon local lifestyles and the general ambience of the area. This was due to the visual character of the development and its compatibility with the aesthetic mood of the area, its ability to contain people on-site more than other kinds of development, and the motivations of buyers and long-term visitors whose interests, by definition, lay in recreational vacations in low-key, nature oriented environments rather than in highly urbanized entertainment centers. In this sense, we feel that the interest of most occupants will be to maintain, rather than intrude upon, the existing character of the area. Secondly, we concluded that, because of the positive economic and social impacts which the development will have, the development will further such local interests as job development, tax base expansion, and enhanced support of necessary public services.

It is clear, however, that such benefits must be accompanied by a development process which involves the growth of understanding between the developer and local residents, and joint efforts to solve mutual problems. The development will have a major impact upon the Koloa-Poipu area, and the project must proceed with cooperation on both sides.

-----  
Thank you for your helpful comments. Please let me know if you need further information.

Yours very truly,



Richard J. Smart

cc: Belt, Collins and Associates, Ltd.

July 21, 1976

Mr. Brian Nishimoto, Director  
Planning Department  
County of Kauai  
4280 Rice Street  
Lihue, Kauai, Hawaii 96766

Dear Brian:

Environmental Impact Statement  
Kiahuna Golf Village, Poipu, Kauai, Hawaii

This letter is written in response to your department's comments pertaining to "Part II - The Physical Impact of Kiahuna Golf Village" of the Kiahuna Golf Village Environmental Impact Statement. Responses to comments on Part II - Economic and Social Impacts, will be provided by McDonald and Smart, Inc.

1. Future Major Road: Your comments regarding the possible locational conflict between the future major road between Koloa and Poipu and the proposed amphitheater are acknowledged. The location of the amphitheater was selected as shown on the Proposed Land Use Plan (Figure I-2) because of the natural depression in the topography, which would afford a more natural and interesting theater structure. As the land use plan is developed in more detail, consideration and attention will be given to the points you raise with respect to the amphitheater's precise location. Further, a buffer zone will be incorporated in more precise plans to insure the road's compatibility with the adjacent residential developments.

2. Poipu Road Pavement Width: The 20-foot pavement width of Poipu Road is noted. The 120-foot right-of-way indicates that there is ample room for widening of this road, should it become necessary.

3. Project Acceptance: It is recognized that McDonald and Smart's and Belt, Collins's statements related to the project's local acceptance and interrelations between the new population and the local population may appear to contain different implications. McDonald and Smart's comments on the acceptability of the proposed project by local residents assumes that maximum communication and understanding will be sought by the developer to reduce to the greatest extent possible any adverse social problems or misunderstandings. The Belt, Collins "warning" implies that a negative or undesirable situation could arise should the above efforts not be undertaken.

Mr. Brian Nishimoto  
July 21, 1976  
Page Two

We hope that we have adequately answered your comments, and stand ready to provide you with additional information should the need arise.

Sincerely yours,

James R. Bell

LEH:kko

cc: Robert Harmon  
Mike Vance

OFFICE OF ECONOMIC DEVELOPMENT  
County of Kauai  
Lihue, Kauai, Hawaii



NOTED
Mr.
Li.
OK
8

MEMORANDUM

TO: Mr. Brian Nishimoto      DATE: 6/30/76  
FROM: James N. Kurita  
SUBJECT: Environmental Impact Statement - Kiahuna Golf Village

Enclosed you will find comments prepared by Valerie Ako of my staff after careful review of an EIS submitted by Moana Corporation as prepared by Belt Collins and McDonald and Smart Inc.

Should there be any questions, please contact me at your convenience.

With warm regards.

*James N. Kurita*  
\_\_\_\_\_  
DIRECTOR

Enclosure

ENVIRONMENTAL IMPACT STATEMENT  
KIAHUNA GOLF VILLAGE

The following is a list of questions, comments and opinions concerning "An Analysis of the Economic, Social and Environmental Impacts of Kiahuna Golf Village."

<u>Page</u>	<u>Comments and quotes from the Kiahuna Golf Village's EIS</u>
17	(1) "Consequently, it is clear that the Moana Project, based on its present schedule of anticipated lot prices, will afford an opportunity to meet a substantial portion of the presently unfilled demand for permanent housing for Kauai residents.
28	"Hence, the project will afford an opportunity for large numbers of Kauai residents who wish to build single-family dwellings to do so in a planned community offering a high quality of life.
59	" ... approximately 40% of the households on Kauai, assuming 1974 income levels, can afford the lowest priced lots in the Moana Project.
329	"Single-family homesites, priced to fill a substantial portion of Kauai's need for permanent local housing."  The EIS leaves the impression that the single family lots will meet the housing demand on Kauai. However, on page 55, the consultants expect that "perhaps 25-50% of the lots will be sold to Kauai residents who wish to live in the Poipu area and are attracted to golf." This 25-30% is 75-90 lots, hardly filling a substantial portion of the demand for housing.  Also, the demand for housing is probably greater for those with low to moderate incomes while Moana is offering lots for middle to high income families as discussed in the analysis.
21	(2) "Combining the above estimates of economic change, the total gross economic change ranges from \$8,695,000 in year 1 to \$20,263,000 in year 15. Thereafter, it declines (because of termination of construction) and remains at approximately \$14,888,000 annually."

These figures, we believe, are incorrect as presented. Table V-17--Projected Economic Activity as a Result of the Moana Project on page 167 shows a row figure titled "Total Gross Economic Change" which is the sum of

"Initial Economic Change" and "Total Economic Change" figures under the headings "Temporary Employment" and "Permanent Employment." However, Total Economic Change already includes the initial economic change (see Tables V-15 and V-16), so that the Total Gross Economic Change figure includes double counting! The error is greatest in year 15.

- 30 (3) "The Moana project tennis courts will not only enhance recreational opportunities for Kauai residents by making additional tennis courts available for their use, the Moana courts will help relieve the congestion on the existing Koloa courts cause by tourist use, since the Moana courts are located closer to the major hotels in the Poipu area."

Although there will be more tennis courts, they will primarily be used by the residents and guests of Kiahuna. Will there be great amount of times available for others to utilize these courts? Also would other hotel guests be more likely to use the free public courts or courts which they must pay?

- 32 (4) "The major sources of employment are tourism, agriculture, and contract construction.

38 The table on this page includes construction as a major source of employment.

There may be a difference of opinion as to whether contract construction is a 'major' source of employment. Currently, though, they do make up a large percentage of the insured unemployed.

- 68 (5) "This demonstrates that the overall 1974 average in Poipu was 80.7% and that Poipu generally has a higher occupancy rate than the Island as a whole."

Please note that from 1970-74 Poipu's average occupancy was higher than the rest of the Island and particularly the Lihue-Wailua area. In 1975 this was reversed as Poipu had a 74.0% average occupancy while the rest of the Island the annual average was 77.2%. In the first four months of 1976; the Lihue-Wailua visitor area, which has three times the number of visitor units, had a higher occupancy rate than the Poipu area. Hopefully, the occupancy will rise as the number of units also increases in the Poipu area!

- 76 (6) Part III - MARKET ANALYSIS

Although the consultant list on page 54 the single

family lot prices and number of lots, there was no indication what the lot sizes were. On page 78, it states that the lots will "average approximately 6000 square feet." If this is the average than some lots will be smaller compared to the idea expressed on page 3 which says "the development, which will be referred to as the Moana Project, will consist of approximately 1,450 dwelling units with an overall density of slightly less than three units per acre."

85 (7) Table IV-6

Assessed land value for the 18-hole Golf Course is listed as \$840,000 in Year 2. However, following the consultants' analysis of \$4,200 assessed value per acre with 150+ acres (page 83), the total should be around \$630,000.

Assessed value of the improved land for the Tennis Court Complex is listed at \$683,000. Again, following the consultant's analysis on page 83, this figure is too high. We wonder if this figure includes the existing courts, which should not be included because it is separate and apart from this project analysis.

162- (8)  
165

Please note that the construction activity impacts are for the 15-year construction period only and the full effects of the tourist activity will be realized after year 14. The same would hold for Table V-18 (page 168) for the employment change with building construction effects up to year 15 and hotel employment change after year 14 for the full effect.

169 (9)

Please note the caveat of the section COMMENTS ON THE ANALYSIS.

288 (10)

Please note this statement: "This new population will probably not be "local" in composition, and may have entirely different concerns than the local residents."

This may be an indication that such residents and visitors will be the type opposed to high densities and high rises (by the type of accommodations they pick) as many of the vocal Poipu residents seem to be.

289- (11)  
290

In answer to the concerns expressed by Koloa-Poipu residents as part of the Socioeconomic Report, the following are comments to the consultants' comments on:

1. Although 40% can afford the lots, as pointed out, the developers do not expect Kauai residents to make up the bulk of the sales. They only expect 75-90 lots sold to Kauai residents--hardly an answer to the citizens' concerns.

5. Although this project will provide jobs, the citizens' concerns are for good jobs. Perhaps the multiplier effect will take care of this since for the permanent job section only 7.5 jobs are expected to be filled by Kauai residents with average salaries over \$10,000 (see page 160).
9. The land is currently zoned agriculture which would make lands available to farmers. However, what can be grown here is questionable. The consultants' comments seems to skirt this concern.

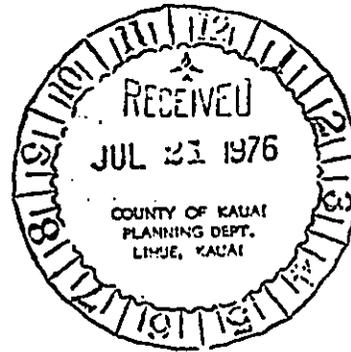
291 (12) "Unless efforts are made on both sides to understand the thinking of the other, and to promote interaction, there may be a potential of polarization and friction which would be undersirable in a resort destination area. The key to this problem will have to be understanding and cooperation for a cohesive new community."

Please note!!!

Richard J. Smart  
1845 Leavenworth Street  
San Francisco, California 94109  
(415) 771-6200

July 19, 1976

Mr. James N. Kurita  
Office of Economic Development  
County of Kauai  
Lihue, Kauai, Hawaii



NOTED:

Subject: Environmental Impact Statement, Kiahuna Golf Village

Dear Mr. Kurita:

Thank you for your comments relating to the above-referenced Environmental Impact Statement. As the consultant responsible for the economic impact analysis, Moana Corporation has asked me to respond. The format of the following responses follows that of your comments — i.e., each subject is referred to by the number in parenthesis in the margin of your letter.

(1) Other commentators have made the same general point — namely, how "substantial" is the contribution to local housing? The development is designed in concept as a destination resort. Its success in that regard is what will result in the economic benefits to the County which are analyzed in the EIS. Yet, within that concept — which is a given if the project is to be viable — the developer has attempted to contribute to the supply of locally owned housing by providing within the overall price structure properties which moderate income residents can afford. It is assumed that most Kauai residents would prefer single family houses; hence, it is expected that they would be most interested in lot purchases. The 75-90 lots which it is anticipated local residents might buy represents 25-30% of the entire inventory of lots. What one considers "substantial" is, of course, a subjective question. However, I would regard the pricing of one-fourth to one-third of the lots, within a generally higher priced destination resort project, at an artificially low level to enable local purchases to be a substantial contribution to local housing. This is particularly so when the estimated prices for the lower priced lots will in effect be jointly subsidized by the developer and the purchasers of higher priced properties. Finally, it should be noted that 90 single family houses represent 4.5% of all of the building permits issued for single family houses in Kauai during the five year 1970-74 period. Again, individuals may differ, but I would consider this a "substantial" contribution by a single developer.

(2) Your comment that double counting occurred in the development of Table V-17, "Projected Economic Activity as a Result of the Moana Project," is correct. We will produce a corrected chart and forward it to the County. The error does not affect our estimates of employment generated, income generated, or public costs and revenues. Its only effect is upon the calculation of total economic activity. I appreciate your catching this error.

Planning, Management, Economics, Public Policy Research

Mr. James N. Kurita  
July 19, 1976  
Page Two

(3) The tennis courts will be open to the general public, as distinct from residents and guests, on a nondiscriminatory basis. The only exception to this would be when tournaments are held, or when large groups book the courts in advance. However, this generally has not been a problem with the existing courts and is not expected to be a problem with the additional ones. In general, there will be equal time available for general public use.

Experience to date indicates that guests in other hotels will be more likely to use the Kiahuna courts than the public courts, thus alleviating the pressure on Koloa's public courts.

(4) Again, the question of whether construction is a "major" source of employment is a subjective matter depending on one's standard for use of the term. Whether one so characterizes it does not affect the analysis. Hence, we would demur to the comment.

(5) When we conducted the study, the 1975 occupancy figures were unavailable, and we appreciate the updating contained in your comments. One reason for the shift in occupancy rates comparing the Poipu area with other areas may be the construction of new condominium units at Kiahuna. There almost always is a lag between the completion of new rental units and the response of the market to the availability of such units.

(6) The range of lot sizes has not yet been determined in detail because the developer has not yet proceeded to detailed site planning. Should the General Plan Amendment be approved, the siting of lots will proceed shortly thereafter, and the County will have an opportunity to review the plan for adequacy. However, the statement that the project "will consist of approximately 1,450 dwelling units with an overall density of slightly less than three units per acre" does not conflict with the statement that the lots will average approximately 6,000 square feet. The density reference is to gross density. Also, the dwelling units include the condominiums which will be clustered.

(7) The assessed land value for the golf course was based on information originally provided us that the committed land might approach 200 acres. If it in fact turns out to be 150 acres, your comment will be correct — i. e., the assessed valuation should be shown as \$630,000.

(8) We agree with your comment as to the duration of the construction activity economic impacts and the year in which there will be full realization of tourist activity impact.

(9) Requires no response.

Mr. James N. Kurita  
July 19, 1976  
Page Three

(10) We are in agreement that the values of the new residents and visitors, while being different in some respects from those of the existing local residents, will be similar in their opposition to massive structures and high densities. As you pointed out, such values will be the motivating factor in their picking the kind of accommodation offered in the development. We emphasized this point in the social impact section of the report.

(11) Comment: "Although 40% can afford the lots, as pointed out, the developers do not expect Kauai residents to make up the bulk of the sales. They only expect 75-90 lots to be sold to Kauai residents — hardly an answer to the citizens concerns."

As noted above, the development is primarily conceived as a destination resort, which is essential to its economic viability and hence to its positive economic impact upon the county. The question is not whether the developer can single-handedly solve the County's housing problem, but whether a plan has been conceived which represents a meaningful contribution to a solution. The pricing of lots at a level which justifies an estimate that 30% of the lots may be purchased by local residents is, within the context of the concept of the project and the developer's capabilities, a significant contribution.

The comment on the quality of jobs that will be developed is important. Any enterprise can only offer those jobs which are relevant to the nature of its business. It should be noted that the developer projects that 50% of construction management jobs will be filled by local residents and 75% of foreman/supervisor jobs. Similarly, it is anticipated that 50% of sales, rental and golf course management positions will be filled by local residents. Virtually all other jobs are anticipated to be filled by all local labor to the extent that it is available, and such labor will be paid prevailing rates.

Regarding the comment on agricultural use of the property, it is clear that the land is not susceptible to economic agricultural use. (See page 276 of the EIS and the report of Jack Larson, the agricultural consultant.)

-----

Your emphasis on the need for cooperation and understanding on both sides is highly appropriate. These attitudes are essential to a project which is both successful from the developer's point of view and beneficial to the interests of the larger community.

Mr. James N. Kurita  
July 19, 1976  
Page Four

Thank you for your comments. I hope these responses have been helpful in the County's consideration of the project. As more specific information develops in respect to some planning areas, we will forward it to you.

Yours very truly,



Richard J. Smart

cc: Mr. Brian Nishimoto  
Belt, Collins and Associates, Ltd.

July 15, 1976

Mr. James N. Kurita, Director  
Office of Economic Development  
County of Kauai  
Lihue, Kauai, Hawaii 96766

Dear Mr. Kurita:

The following is in response to your comments on "Part II - The Physical Impact of Kiahuna Golf Village" for the Kiahuna Golf Village Environmental Impact Statement.

- o Comment (10) -- We acknowledge that it is felt that the proposed Kiahuna Golf Village offers an alternative to "Waikiki-style" resort development in a low-key setting. Probably, a prerequisite to live in this development would be a desire to experience a relaxed life-style.
- o Comment (11) -- This comment is acknowledged. However, as with any economic situation, sales will depend on demand and the buying capabilities of the potential markets.

The following response pertains to the comment on employment, examining Table V-12 on Page 160. While it is true that there will only be 7.5 permanent jobs filled by Kauai residents with salaries over \$10,000 per year, it should be noted that there are only 14 such jobs projected for the project. In addition, it is projected that there will be 146 permanent jobs with annual salaries between \$9,000 and \$10,000, and another 230 permanent jobs with annual salaries between \$8,000 and \$9,000. It should be noted that 38% of all families and 65% of all unrelated persons in the State of Hawaii, as of 1972, did not have a \$10,000+ per year income. (Source: The State of Hawaii Data Book, 1975, Page 160).

The discussion of agricultural suitability of the proposed development site is on Pages 286 and 287. In short, this site has low cultivation potential due to its thin, rocky, clayish soil and lack of rainfall.

We hope that your comments have been adequately addressed.

Sincerely yours,

  
Joseph Vierra, Jr.

SM:gk  
cc:

Brian Nishimoto  
Robert Harmon

COUNTY OF KAUAI  
PLANNING DEPARTMENT

DATE: May 28, 1976

FROM: Brian Nishimoto, Planning Director

SUBJECT: General Plan Amendment, GPA-76-6; Moana Corporation

TO: (XX) Public Works Dept.  
(XX) Water Dept.  
(XX) State Health Dept.  
( ) State Highways Division  
(XX) Fire Dept.  
(XX) Economic Development Office  
( ) Kauai Electric Co.  
( ) Sam Lee (DLNR)  
(XX) State Dept. of Agriculture  
(XX) State Dept. of Taxation, Real Property Division

FOR YOUR COMMENTS (pertaining to your department):

July 1, 1976

As recognized in the applicant's E.I.S., our water source, storage, and transmission facilities are inadequate for this development.

State funds are available for part of the costs of the necessary improvements to serve the existing urban lands in Poipu, and construction plans are being prepared.

These proposed facilities may have to be enlarged in order to serve this additional area if it is urbanized. We have not made detailed analysis as yet, but it appears that a tank larger than the proposed one million gallon tank would be required if it is urbanized. This is contrary to the statement made on page 233 of the E.I.S.

We also expect, as is noted in the E.I.S., that the potential developers, including Moana Corp., will contribute as is necessary to complete the water project.

We have no objections to this G.P.A. provided that water source, storage, and transmission facilities are upgraded prior to actual development, and that the developers be required to contribute their fair share to the cost of water improvements.

Signature 

Please return one (1) copy by June 11, 1976 Thank you.

LEH  
JRB

July 16, 1976

Mr. Walter L. Briant, Jr.  
Water Department  
County of Kauai  
P.O. Box 111  
Lihue, Kauai, Hawaii 96766

Dear Mr. Briant:

Kiahuna Golf Village

This letter is in response to your comments made in a letter dated May 28, 1976, with regards to the Kiahuna Golf Village Environmental Impact Statement.

Moana Corporation will cooperate with the County of Kauai Water Department in its development of additional water sources, and will contribute its fair share in relationship to the demand placed on the water system by the proposed development. It was felt that the one million gallon storage tank would be sufficient; however, we acknowledge that a larger tank may be required for Moana and others in the area.

We hope that your comments have been adequately answered.

Sincerely yours,

  
Joseph Vierra, Jr.

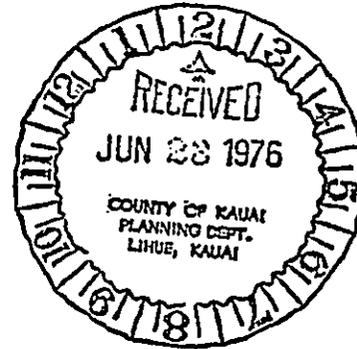
JV:kko

cc: Brian Nishimoto  
Robert Harmon

DEPARTMENT OF FINANCE

County of Kauai  
Lihue, Kauai, Hawaii

M E M O R A N D U M



TO: BRIAN NISHIMOTO

FROM: WALLACE REZENTES

DATE: JUNE 23, 1976

SUBJECT: GENERAL PLAN AMENDMENT, CPA-76-6; MOANA CORPORATION

This is in response to your request to comment on certain County financial areas outlined in "An Analysis of the Economic, Social and Environmental Impacts of Kiahuna Golf Village."

I will comment on the representations made on those pages that relate to County finances.

Page 31

Under existing laws, the three alternatives outlined to correct the excess of County expenditures over County generated permanent revenue is a fair statement.

Page 77 through 99

The financial benefits that the County will realize from the project if approved will be substantial. However, the benefit may not amount to \$12 million. The reason for the latter is as follows:

1. A change in the State assessment law. The assessed valuation of property was lowered from 70% to 60%. The effect reduces the amount of real property tax revenues that the County will be receiving in the future, unless the rate increases.
2. A change in the State homeowner's exemption law. The assessed valuation of property for owner occupied dwellings will be less because of a increase in the homeowner exemption.

Page 136

The comments relative to County finances are generally fair except that the County is not allowed to borrow funds to operate.

If you desire further information please feel free to contact me.

  
DIRECTOR OF FINANCE

fg

-454-

cc: Mayor

Richard J. Smart  
1845 Leavenworth Street  
San Francisco, California 94109  
(415) 771-6200

July 19, 1976

Mr. Wallace Rezendes  
Department of Finance  
County of Kauai  
Lihue, Kauai, Hawaii

Subject: General Plan Amendment, CPA-76-6, Moana Corporation

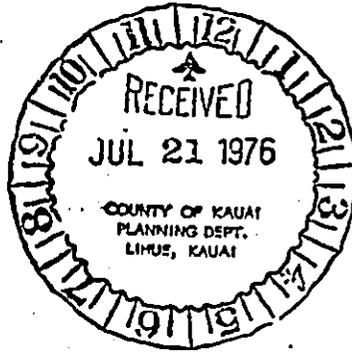
Dear Mr. Rezendes:

This is in response to your comments on portions of our report, "An Analysis of the Economic, Social, and Environmental Impacts of Kiahuna Golf Village," which bear upon County finances.

I appreciate your comments relating to changes in State law which have occurred since we conducted the study. As I understand it, the assessed valuation of property was lowered from 70% to 60%, and the assessed valuation of property for owner occupied dwellings will be less because of an increase in the homeowner's exemption.

As you noted, these changes would indeed result in a minor reduction of financial benefits from the \$12 million net that we estimated. However, as you observed, "The financial benefits that the County will realize from the project if approved will be substantial," and the general thrust of our analysis and the conclusions derived therefrom are not affected by these changes in State law.

Thank you for pointing out that the County is not authorized to borrow funds for operating. In listing alternatives open to the County in dealing with its long-term deficit problem, we simply were setting forth all hypothetical sources of funds which would have to be considered in the absence of expansion of the tax base. The inability of the County to borrow narrows the options available to the County, leaving as viable alternatives only reduction of public services, increases in existing taxes, or expansion of the tax base. Our conclusion in this section relating to financial benefits was that "the Moana Project would have a major positive impact on the tax base expansion, while requiring additional public service costs significantly lower than public revenues generated." Your letter indicates your agreement with that conclusion.

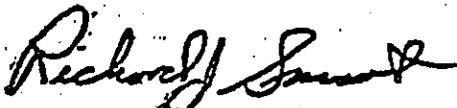


NOTED:

Mr. Wallace Rezendes  
July 19, 1976  
Page Two

Thank you for your informative comments.

Yours very truly,

  
Richard J. Smart

cc: Mr. Brian Nishimoto  
Belt, Collins and Associates, Ltd.

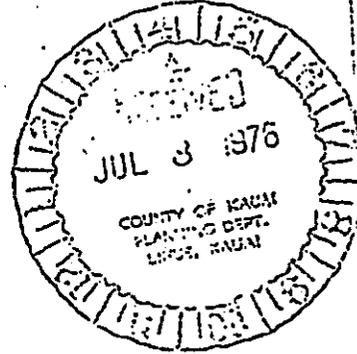
EDUARDO E. MALAPIT  
Mayor



LOWELL J. AGENA  
Housing Administrator

COUNTY OF KAUAI  
OFFICE OF THE HOUSING ADMINISTRATOR  
4396 RICE STREET  
LIHUE, KAUAI, HAWAII 96766

July 8, 1976



Mr. Brian Nishimoto  
Planning Director  
County of Kauai  
Lihue, Hawaii 96766

Dear Brian:

Subject: Review of the draft Environmental Impact Statement for the proposed Kiahuna Golf Village, Poipu, Kauai

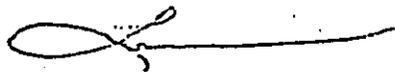
Thank you for the opportunity to review "An Analysis of the Economic, Social and Environmental Impacts of Kiahuna Golf Village." My comments on the proposed residential housing development within the Village are as follows:

1. The consultants state on page 6 that the single-family residential home sites will be subject to "architectural controls imposed by the developer." May I suggest that if a review board is created to carry out this function, it would behoove Moana Corporation to include local Kauai residents on such a board. Such an action would indicate to Kauai residents that the designs would not strictly be controlled by "outsiders" and would probably feel more comfortable dealing with "one of their own."
2. Throughout the economic and social analysis section, reference is made to the idea that local residents will be afforded the opportunity to purchase residential lots. I tend to question whether the Kauai resident would, in fact, want to do so. Based on past experience, local residents have not shown interest in leasehold properties, preferring fee-simple residential lots.
3. On page 78, mention is made that the average size of the lots would be 6,000 square feet. This indicates that the lesser priced lots would be smaller than this average. Discussion and/or listing of lot sizes should be included along with some explanation of how Moana Corporation hopes to subdivide into what seems to be substandard lot sizes.

4. Employee housing on the project site is mentioned on page 207 as a means of attaining Goal 6. This concept should be further elaborated upon as to where on project site it will be located, what kind of structures, etc.

I hope that these comments/suggestions will be useful in clarifying the residential housing concepts of the Kiahuna Golf Village.

Sincerely,



LOWELL J. AGENA  
HOUSING ADMINISTRATOR

LJA:cs

Richard J. Smart  
1845 Leavenworth Street  
San Francisco, California 94109  
(415) 771-6200

July 19, 1976

Mr. Lowell Akena  
Office of the Housing Administrator  
County of Kauai  
4396 Rice Street  
Lihue, Hawaii 96766

Subject: Environmental Impact Statement for Kiahuna Golf Village, Poipu, Kauai,

Dear Mr. Akena:

This is in response to your letter dated July 8, 1976 regarding the above-referenced Environmental Impact Statement.

1. Your suggestion that a local Kauai resident serve on an architectural review board is worth considering. Some method for obtaining local input on matters of this kind is essential to ensure that a development proceed in a fashion which is consistent with the positive aesthetic characteristics of an area. Whether the best way of obtaining local input is an architectural review board or some other mechanism should be assessed. I have suggested that, if the General Plan Amendment is approved, the developer should meet with you and the Planning Director to discuss the matter.
2. I appreciate your comment that in general local residents have not shown great interest in leasehold properties. However, the leasehold interest is a constraint within which the development must proceed. It is hoped that the favorable pricing of a number of lots below the market will attract local residents who otherwise would not have an interest in leasehold properties.
3. The Planning Department staff has raised the same question regarding lot size. The following response is a quotation of the response I sent to Brian Nishimoto:  
  
"The exact mix of lot sizes has not been determined, since the developer has not yet specifically designed and sited the lots. This will be accomplished during detailed site planning should the General Plan Amendment be approved. The County will have an opportunity to review the specific sizes and siting of lots at that time. The developer has assured us that lot sizes will comply with County standards."

Mr. Lowell Agena  
July 19, 1976  
Page Two

"It should also be noted that, while size will be a factor in pricing lots, much more important factors are location and topographical quality. Although an averaging process will take place, larger lots will not be used, through such a process, to achieve the development of only marginally acceptable small lots which, when considered by themselves, would not reflect responsible development."

4. Should there prove to be a demand for employee housing, it will be constructed in the area of the golf clubhouse. The construction will be in the nature of small condominiums and efficiency apartments.

-----  
Thank you for your comments. I hope my responses are helpful in your consideration of the project. Please let me know if you desire additional information.

Yours very truly,



Richard J. Smart

cc: Mr. Brian Nishimoto ✓  
Belt, Collins and Associates, Ltd.

From: County of Kauai  
Office of Housing Administrator  
dated July 8, 1976

to: Brian Nishimoto

1. The consultants state on page 6 that the single family residential homesites will be subject to architectural controls imposed by the developer. May I suggest that if a review board is created to carry out this function, it would behoove Moana Corporation to include local Kauai residents on such a board. Such an action would indicate to Kauai residents that the designs would not strictly be controlled by outsiders and would probably feel more comfortable dealing with one of their own.
2. Throughout the economic and social analysis section, reference is made to the idea that local residents will be afforded the opportunity to purchase residential lots. I tend to question whether the Kauai resident would in fact want to do so. Based on past experience, local residents have not shown interest in leasehold properties, preferring fee simple lots.
3. On page 78, mention is made that the average size of the lots would be 6,000 square feet. This indicates that the lesser priced lots would be smaller than this average. Discussion and/or listing of lot sizes should be included along with some explanation of how Moana Corporation hopes to subdivide into what seems to be substandard lot sizes.
4. Employee housing on the project site is mentioned on page 207 as a means of attaining goal 6. This concept should be further elaborated upon as to where on the project site it will be located, what kind of structures, etc.

CITIZENS

UTILITIES



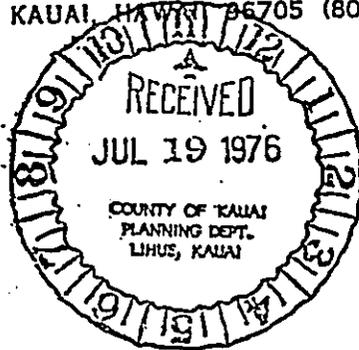
COMPANY

P. O. BOX 278 • ELEELE, KAUAI, HAWAII 96705 (808) 335-3131

July 13, 1976

File #M

NOTED:



Handwritten notes in a 'NOTED:' box, including initials and a signature.

County of Kauai  
Planning Department  
Post Office Box 111  
Lihue, HI 96766

ATTENTION: Mr. Brian Nishimoto, Planning Director

SUBJECT: KIAHUNA GOLF VILLAGE

Dear Mr. Nishimoto:

We have reviewed the study prepared for Kiahuna Golf Village and have the following comments:

- 1) Page 201 states that the power requirements are met under normal conditions by Koloa Mill Power Plant. This statement is not true. Power is from the Kauai Electric system.
- 2) Power to this development is available under our line extension agreement, Rule 13.

In this case the following will have to be accomplished to serve this development by way of an advance from Moana Corporation:

- a) A separate distribution line from our Koloa Substation will have to be constructed to serve this development.
- b) The Koloa Substation will have to be expanded to serve the new line.

Very truly yours,

*Boyd T. Townsley*  
BOYD T. TOWNSLEY  
Manager

BTT:kk

-462-

KAUAI ELECTRIC

A DIVISION OF CITIZENS UTILITIES COMPANY

ELECTRIC, TELEPHONE, WATER AND GAS SERVICE TO CUSTOMERS IN OVER 550 COMMUNITIES IN MANY STATES ACROSS THE NATION



Belt, Collins and Associates, Ltd.  
Engineers, Planners and Landscape Architects

Hawaii Bldg., Suite 514, 745 Fort St., Honolulu, Hawaii 96813, Phone 521-5361

July 23, 1976

Mr. Boyd T. Townsley  
Manager  
Kauai Electric  
P.O. Box 278  
Eleele, Kauai, Hawaii 96705

Dear Mr. Townsley:

Kiahuna Golf Village

We hereby acknowledge receipt of your comments to the EIS for the Kiahuna Golf Village and respond in the same numerical sequence.

1. Power from the Kauai Electric system and not from Koloa Mill is hereby acknowledged.
- 2.a) Moana acknowledges that certain monies may be required to get a distribution line to the site.
- 2.b) Expansion of the Koloa substation, as necessary for the progress of the development, may be necessary. Costs incurred for this expansion, as is customarily paid by the developer, will be worked out with the utility company to its satisfaction.

Very truly yours,

Joseph Vierra, Jr.

JV:kko

cc: Brian Nishimoto  
Robert Harmon  
Mike Vance

-463-

*Principals:* Robert M. Belt, James R. Bell, Paul M. Hirota, Frank E. Lyon, Jr.  
*Associates:* William D. Ng, Raymond F. Cain, Mark H. Hastert, Larry E. Helber, Joseph Vierra, Jr., Paul P. Wallrabenstein, Jr.



AMERICAN  LUNG ASSOCIATION of Hawaii

April 9, 1976

REVIEW OF THE DRAFT EIS FOR THE PROPOSED  
KIAHUNA GOLF VILLAGE AT POIPU, KAUAI

1. Generation of Automotive Emissions (p. 99)

- a. We are unaware of the existence of any federal light duty vehicle emission standard for particulate matter and wonder about the source of the 0.1 g/mi value listed.
- b. Diesel standards for CO, HC and NOx are grams per brake horsepower-hour (g/BHP-hr), not grams per mile (g/mi).
- c. The diesel standards for HC and NOx are a combined standard of 16 g/mi, not 16 g/mi for each.
- d. The standard for diesel engines which pertains to particulate emissions is an opacity standard measured in percentages at different operating modes.
- d. Use of standards as emission factors (EF) is unrealistic since it does not represent the mix of types and ages of vehicles on the road in a given calendar year. In 1979, for example, most of the vehicles on the road will not be 1979 models but may well be pre-1975 and not subject to either 1975 or 1979 standards. This makes a significant difference in the total emissions that are estimated. We recommend that you follow the procedures described in EPA publication AP-42 with Supplement 5<sup>1</sup> developing EF's for each type vehicle for each calendar year of interest and then calculate total emissions based on the sum of total vehicle miles traveled (VMT) by each type.

2. Conclusions (p. 102). None of the conclusions presented can be drawn from the calculations that preceded them because no data was presented on the emissions resulting from bus movement of the employees or residents nor any data on the effect of federal or state emission standards.

3. Final paragraph (p. 102)

- a. While it is certainly true that "meteorological conditions vary from place to place," a micrometeorological study or collection of existing data from a nearby weather recording station would

provide the data necessary to perform a microscale analysis for the immediate area of the proposed development.

- b. The oxidation of CO to CO<sub>2</sub> does not occur "in a short time." The mean residence time of atmospheric CO has been estimated at one month to five years. In fact, CO's relative inertness in the atmosphere is the very reason it is chosen for most mathematical modeling.
  - c. Line source modeling could very easily be applied to this project. Gaussian diffusion equations as used by Turner<sup>2</sup>, Calder<sup>3</sup>, the California Department of Transportation (CALINE 2)<sup>4</sup>, and EPA (HIWAY)<sup>5</sup>, could be applied in this case. The recently published EPA guide for evaluating indirect sources<sup>6</sup> might also be useful. The dispersion models are hardly more in the research stage than the jet engine on which research continues to be performed in an effort to improve the basic model. A qualitative analysis is simply inadequate.
4. First paragraph (p. 103). The fact that the land may slope toward the sea has little bearing on the dispersion of pollutants. Meteorological data concerning the area should be gathered to substantiate statements made about prevailing wind conditions. Of particular importance is diurnal variation particularly if it indicates any correspondence with peak traffic periods.

#### REFERENCES

1. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors (2nd Ed.) with Supplements 1-5 (1973).
2. U.S. Environmental Protection Agency. Workbook of Atmospheric Dispersion Estimates, revised 1970 (1973).
3. Calder, Kenneth L. "On Estimating Air Pollution Concentrations From a Highway in an Oblique Wind," Atmos. Env. 7: 863-868 (1973).
4. California Department of Transportation, Division of Highways. Air Quality Manuals - Volumes I-VIII with Modifications 1-6 (1972).
5. U.S. Environmental Protection Agency. Users Guide to HIWAY, A Highway Air Pollution Model (1975).
6. U.S. Environmental Protection Agency. Guidelines for Air Quality Maintenance Planning and Analysis Volume 9: Evaluating Indirect Sources (1975).

LH  
JVG  
Fli

- 75.10-0

April 21, 1976

Mr. James W. Morrow, Director  
Environmental Health  
245 North Kukui Street  
Honolulu, Hawaii 96817

Dear Mr. Morrow:

We appreciate your comments on the air quality impact analysis section of the Environmental Impact Statement for the Moana Corporation's development at Poipu, Kauai.

In reply to the points that you raised, please be advised of the following: the "Generation of Automotive Emissions" section will be augmented according to the Compilation of Air Pollutant Emission Factors, supplements 1-5 (March 1975) by the U.S.E.P.A.. We are also reviewing again Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9.

Through Harold Youngquist of the State of Hawaii Department of Health, we have been examining a modeling methodology for the dispersion of airborne pollutants for use in Environmental Impact Statements and, if appropriate, we will use it for further study of Moana's development. Also, the Hiway air pollution model is being studied.

Please contact us if you have further comments.

Sincerely yours,



James R. Bell

JRB:kko

cc: Robert Harmon  
Mike Vance



Belt, Collins and Associates, Ltd.  
Engineers, Planners and Landscape Architects

Hawaii Bldg., Suite 514, 745 Fort St., Honolulu, Hawaii 96813, Phone 521-5561

April 26, 1976

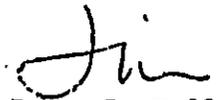
Mr. Robert L. Harmon  
Moana Development Corporation  
451 Jackson Street  
San Francisco, Ca. 94111

Dear Bob:

Enclosed is a simplified dispersion analysis of carbon monoxide levels at various distances from Poipu Road. It was prepared in response to comments made by James Morrow, director of the American Lung Association of Hawaii, regarding the Moana Project E.I.S..

In addition to this dispersion analysis, emission calculations will be changed somewhat to mirror the Federal Air Pollutant Emission Factors, and we will provide a projected split of the age of vehicles at a future date. These additional calculations are pending our receipt of data requested from the City of Honolulu, Department of Data Services. We will send the added calculation on to you after they arrive.

Sincerely yours,

  
James R. Bell

JRB:kko

enc.

cc: Mike Vance

-468-

*Principals:* Robert M. Belt, James R. Bell, Paul M. Hirota, Frank E. Lyon, Jr.  
*Associates:* William D. Ng, Raymond F. Cain, Mark H. Hastert, Larry E. Helber, Joseph Vlerd, Jr., Paul P. Wallrabenstein, Jr.

## DISCUSSION OF VEHICLE EMISSION ANALYSIS

The projected amount of emissions to be generated by the Moana Project is dependent upon assumptions made about the various meteorological and emission factors. Different assumptions (i.e., trip distance, vehicle age, etc.) will change these calculations. However, based on the various tables of emission factors presented, it can be concluded that emissions in the future will be reduced because of improvements in internal combustion engine technology to meet increasingly stringent Federal emissions standards. The reason for nitrogen oxide (NO<sub>x</sub>) emissions remaining approximately the same in the future while others will decrease is that on a percentage basis, the reduction of NO<sub>x</sub> will not be as great as that of carbon-monoxide (CO) and hydrocarbons (HC).

In addition, in all emission calculations, the worst case was assumed. For example, in the actual situation at the Moana Project, more late model cars will be in use because visitors and part-time residents will most likely rent cars from rental agencies. However, trips were split evenly over groupings of vehicles with ages ranging from the current year to 14 years old. Also the Moana Project will most likely contain amenities (golf course, etc.) which will mean that the development will have a greater "containment" factor.

It is also important to note that the generated pollutants will be spread over corridors from Waimea to Lihue rather than concentrated at Poipu. The dispersion analysis for Moana Project predicts the impact on the immediate area.

SUMMARY

VEHICLE EMISSIONS - MOANA PROJECT  
(Lbs/Day)

<u>Truck Emissions</u>	Carbon Monoxide		Hydrocarbons		Nitrogen Oxides		
	1980	21.4		3.4		12.0	
1985	16.4		2.6		10.4		
1990	17.1		2.7		10.5		
<u>Car Emissions</u>	Average	Maximum	Average	Maximum	Average	Maximum	
	1980	1,237	1,732	128	179	87	121
1985	954	1,379	114	166	106	155	
1990	487	707	70	103	88	127	
<u>TOTALS</u>	1980	1,258	1,753	131	182	99	133
	1985	970	1,395	117	169	116	165
1990	504	724	73	106	99	138	

## TRUCK EMISSIONS ANALYSIS

### Assumptions

- (1) Because there is a lack of data and few vehicles involved, it will be assumed that the average age of all trucks will be 5 years old at the year of usage.
- (2) All trucks supplying topsoil, concrete, asphalt cement, base course, and building materials will be considered as heavy-duty, diesel-powered vehicles. All trucks (and vans) used for supply trips and service deliveries will be considered as light-duty, gasoline-powered vehicles.
- (3) Emissions from crankcase, tire wear, and evaporation will be considered negligible.
- (4) The amount of truck emissions is constant.

SELECTED CARBON MONOXIDE, HYDROCARBON, AND NITROGEN OXIDES  
EXHAUST EMISSION FACTORS FOR LIGHT-DUTY, GASOLINE-POWERED  
TRUCKS AND HEAVY-DUTY, DIESEL-POWERED TRUCKS  
EXCLUDING CALIFORNIA-FOR CALENDAR YEAR 1980, 1985, 1990  
(BASED ON 1975 FEDERAL TEST PROCEDURE)(1)  
(gm/mi)

(Low Altitude) Truck Type	1980 (1975 Vehicles)			1985 (1980 Vehicles)			1990 (1985 Vehicles)		
	CO	HC	NO <sub>x</sub>	CO	HC	NO <sub>x</sub>	CO	HC	NO <sub>x</sub>
Light-Duty, Gasoline-Powered	13.5	2.0	3.6	4.2	0.54	0.73	4.2	0.54	0.73
Heavy-Duty, Diesel-Powered	28.7	4.6	20.9	28.7	4.6	20.9	28.7	4.6	20.9

(1) Supplement No. 5 For Compilation of Air Pollutant Emission Factors, Second Edition, U. S. Environmental Protection Agency; Research Triangle Park, North Carolina; December 1975; Appendix D, through P. D.2-1 to D.2-8, D.5-2.

PROJECTED TRUCK EMISSIONS  
(Lbs/Day)

Truck Type	1980			1985			1990					
	Miles/ Day	CO	HC	NO <sub>x</sub>	Miles/ Day	CO	HC	NO <sub>x</sub>	Miles/ Day	CO	HC	NO <sub>x</sub>
Light-Duty Gasoline- Powered	264	7.9	1.2	2.1	312	2.9	0.4	0.5	384	3.6	0.5	0.6
Heavy-Duty, Diesel- Powered	214	13.5	2.2	9.9	214	13.5	2.2	9.9	214	13.5	2.2	9.9
TOTAL		21.4	3.4	12.0		16.4	2.6	10.4		17.1	2.7	10.5

## AUTOMOBILE EMISSIONS ANALYSIS

### Assumptions:

- (1) 1975 percentage vehicle age distribution will be similar to 1980, 1985, 1990 projections.
- (2) 1990 will be the year used for maximum emission projection.
- (3) No passenger vehicles will be heavy duty or over 8500 pounds gross vehicle weight.
- (4) That the first 5-year increment will be in 1980 and that 1995 emissions will be nearly the same as 1990 emissions (both are more conservative cases).
- (5) The average trip distance will be 12 miles.
- (6) For passenger trips, the average and maximum daily traffic for the case of "travel behavior without the proposed amenities" at the Moana Project will be used to approximate a maximum contribution of air pollutants. This will be overstating the pollutants, however, if the proposed amenities are constructed.
- (7) For the number of vehicle generated by the Moana Project, the following car per person ratios will be assumed:

Full-time Residents	.33
Part-time Residents and visitors	.50
Employees	.66

In 1975, there was a ratio of .56 car per person based on a population of 35,300, including day visitors, and 19,845 passenger vehicles. If the commercial vehicles were included in this analysis, then the car per person ratios would be lower. Therefore, these car per person ratios are considered to be fair estimates.

- (8) It will be assumed that trips per vehicle are split evenly among the various age distributions. In other words, older vehicles will travel as many miles as newer ones in any given year.

MOANA PROJECT - ANTICIPATED CAR COUNT

Year	Total Cars	Full-Time Residents	.33 cars/ Person	Part-Time Res. & Visitors	.50 cars/ Person	Employees	.66 cars/ Person
5	529	90	30	624	312	284	187
10	948	240	80	1239	619	377	249
15	1377	390	130	1854	927	485	320
20	1397	450	150	1854	927	485	320

GENERATED CAR TRIP DATA

Year	Trips Per Day		Trips Per Car	
	Average	Maximum	Average	Maximum
5	1057	1480	2.00	2.80
10	1985	2859	2.09	3.02
15	2935	4260	2.13	3.09
20	2966	4325	2.12	3.10

**CARBON MONOXIDE, HYDROCARBON, AND NITROGEN OXIDES EXHAUST EMISSION  
FACTORS FOR LIGHT-DUTY, GASOLINE-POWERED VEHICLES-EXCLUDING  
CALIFORNIA-FOR CALENDAR YEAR 1980, 1985, 1990  
(BASED ON 1975 FEDERAL TEST PROCEDURE) (gm/mi)<sup>(1)</sup>**

Location and model year	1980		1985		1990	
	Carbon Monoxide	Hydro- carbons	Carbon Monoxide	Hydro- carbons	Carbon Monoxide	Hydro- carbons
Low altitude						
Pre-1968						
1968	99.0	9.3	57.0	6.2	18.0	3.0
1969	82.6	9.3	57.0	6.2	5.6	0.81
1970	85.4	8.3	57.0	6.2	5.6	0.81
1971	73.5	8.8	18.0	3.0	5.3	0.76
1972	71.0	7.1	17.1	2.8	5.0	0.70
1973	53.0	5.6	16.2	2.6	4.8	0.65
1974	51.0	5.3	4.8	0.65	4.5	0.59
1975	49.0	5.0	4.5	0.59	4.2	0.54
1976	13.5	2.0	4.2	0.49	3.9	0.49
1977	12.6	1.8	3.9	0.43	3.6	0.43
1978	11.7	1.6	3.6	0.38	3.4	0.38
1979	3.4	0.38	3.4	0.32	3.1	0.32
1980	3.1	0.32	3.1	0.32	2.8	0.27
1981	2.8	0.27	2.8	0.27		
1982						
1983						
1984						
1985						
1986						
1987						
1988						
1989						
1990						

(1) Supplement No. 5 For Compilation of Air Pollutant Emission Factors, Second Edition, U. S. Environmental Protection Agency; Research Triangle Park, North Carolina; December 1975; Appendix D, p. D.1-1 through D.1-13.

PROJECTED 1980 CAR EMISSIONS - FIRST 5-YEAR PHASE

(lbs/da)

Age Type	Fraction (1)	No. of Cars	Trips Per Car/Day		Miles Per Car/Day		Carbon Monoxide		Hydrocarbons		Nitrogen Oxides	
			Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum
Pre-1968	.144	76	152	213	1824	2556	398	558	37	52	13	19
1968	.036	19	38	53	456	636	83	116	9	13	4	6
1969	.044	23	46	64	552	768	101	141	10	14	6	9
1970	.058	31	62	87	744	1044	120	169	14	20	7	10
1971	.062	33	66	92	792	1104	124	173	12	17	8	10
1972	.064	34	68	95	816	1140	95	133	10	14	8	11
1973	.075	40	80	112	960	1344	107	151	11	16	10	13
1974	.081	43	86	120	1032	1440	111	155	11	16	10	14
1975	.069	36	72	101	864	1212	26	36	4	5	7	10
1976	.074	39	78	109	936	1308	26	36	4	5	7	10
1977	.081	44	88	123	1056	1476	27	38	4	5	5	7
1978	.083	44	88	123	1056	1476	8	11	1	1	0.8	1
1979	.093	49	98	137	1176	1644	8	11	0.8	1	0.7	1
1980	.035	18	36	50	432	605	3	4	0.3	0.4	0.2	0.3
TOTAL	1.00	529					1,237	1,732	128	179	87	121

(1) Based on 1975 actual passenger vehicle split,  
City & County Department of Data Services.

PROJECTED 1985 CAR EMISSIONS-- 10-YEAR PHASE

(lbs/da)

Age Type	(1) Fraction	No. of Cars	Trips Per Car/Day		Miles Per Car/Day		Carbon Monoxide		Hydrocarbons		Nitrogen Oxides	
			Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum
1972	.144	137	286	414	3,432	4,965	431	624	47	68	34	50
1973	.036	34	71	103	853	1,323	107	155	11	17	9	14
1974	.044	42	88	127	1,053	1,522	132	191	14	21	12	17
1975	.058	55	115	166	1,379	1,933	55	77	9	13	12	17
1976	.062	59	123	178	1,480	2,138	56	81	9	13	13	19
1977	.064	61	127	184	1,530	2,211	55	79	9	13	8	12
1978	.075	71	148	214	1,781	2,573	19	27	3	4	4	6
1979	.081	77	161	233	1,931	2,790	19	28	2.5	3.6	3.8	5.5
1980	.069	65	136	196	1,630	2,356	15	22	2	2.8	2.6	3.8
1981	.074	70	146	211	1,755	2,537	15	23	1.9	2.7	2.2	3
1982	.081	77	161	233	1,931	2,790	15	22	1.8	2.6	1.7	2.5
1983	.083	79	165	239	1,981	2,863	15	21	1.7	2.4	1.5	2.1
1984	.093	88	184	266	2,207	3,189	15	22	1.6	2.2	1.4	2.0
1985	.035	33	69	100	828	1,196	5	7	0.5	0.7	0.4	0.6
TOTAL	1.00	948					954	1,379	114	166	106	155

(1) Based on 1975 actual passenger vehicle split,  
City & County Department of Data Services.

PROJECTED 1990 CAR EMISSIONS - THE 15-YEAR, AND COMPLETION (20-YEAR) PHASE  
(lbs/da)

Age Type	Fraction (1)	No. of Cars	Trips Per Car/Day		Miles Per Car/Day		Carbon Monoxide		Hydrocarbons		Nitrogen Oxides	
			Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum
1977	.144	198	422	612	5,061	7,342	201	291	33	49	29	42
1978	.036	50	107	155	1,278	1,854	16	23	2.3	3.3	4.8	7
1979	.044	61	130	188	1,559	2,262	19	28	2.8	4.0	5.8	8.5
1980	.058	81	173	250	2,070	3,003	26	37	3.7	5.4	7.8	11
1981	.062	85	181	263	2,173	3,152	25	37	3.6	5.3	7.2	10.4
1982	.064	88	187	272	2,249	3,263	25	36	3.5	5	6.4	9.4
1983	.075	103	219	318	2,633	3,819	28	40	3.8	5.5	6.4	9.3
1984	.081	112	239	346	2,863	4,153	28	41	3.7	5.4	5.7	8.2
1985	.069	95	202	294	2,428	3,523	22	33	2.9	4.2	3.9	5.7
1986	.074	102	217	315	2,607	3,782	22	33	2.8	4.1	3.2	4.7
1987	.081	112	239	346	2,863	4,153	23	33	2.7	3.9	2.5	3.7
1988	.083	114	243	353	2,914	4,227	22	32	2.4	3.5	2.2	3.2
1989	.093	128	273	396	3,272	4,746	22	32	2.3	3.3	2.1	3.0
1990	.035	48	102	148	1,227	1,780	7.6	11	0.7	1.1	0.6	0.9
TOTAL	1.00	1,377					487	707	70	103	88	127

(1) Based on 1975 actual passenger vehicle split, City & County Department of Data Services.

DISPERSION ANALYSIS - EXAMINATION OF THE  
EFFECT OF PROJECTED AUTOMOTIVE EMISSIONS(CO) ON THE  
AMBIENT AIR QUALITY

There has been concern over the impact of future automotive emissions on the ambient air quality of Poipu, Kauai, due to the development of a resort residential community by the Moana Corporation(1). As a result of this concern, discussions were held with various agencies in Hawaii State government and departments at the University of Hawaii to determine the most appropriate method for evaluating future ambient air quality levels. At the University, consultation with Dr. Papacostas of Civil Engineering and Dr. Daniels of Meteorology lead to the conclusion that a detailed computer analysis was not warranted in this case for the following reasons:

- o The statistical or Gaussian model (HIWAY) provided by the Environmental Protection Agency requires values of meteorological parameters which are not now known, and at the same time ignores other parameters which will have an effect on the resulting air quality.
  - (a) Accurate wind speed and directionality at the "worst" case situation are required.
  - (b) Soundings must be made in the atmosphere to determine the local stability factors as a measure of the effect of inversion levels.
  - (c) The model assumes that the topography is flat, whereas the Haupu Ridge just north of Koloa-Poipu has an obvious topographic influence.

---

(1) Letter from James Morrow of the American Lung Association of Hawaii, and consultation with Harold Youngquist of the State Department of Health.

- (d) The effect of vegetation on the dispersion of pollutants is not known.
- (e) Accurate data on the distribution of vehicle ages is needed to approximate future emissions, and this data for Kauai is not readily available.
- o There is no ambient air quality monitoring station at or near Poipu. The only station of this kind is located in Lihue, where ambient air is considered excellent. The nearest weather monitoring station (940.1) is at Makaheuna Point, and is maintained by the U. S. Coast Guard. The data collected there (rainfall, humidity, temperature, wind) has not been summarized; it is stored in boxes in the HIG Building at the University of Hawaii. This wind data may not characterize Poipu, in any event.
- o The impact of the project's additional traffic--estimated to be 350 cars 20 years hence--will still mean that Poipu Road will have a volume of traffic at peak hour less than its service capacity of 1,069. The maximum peak hour projection considers the worst case, and it is likely that the peak hour traffic will be substantially less.
- o Even if this meteorological and vehicle census data were readily available, the results would be subject to question due to the parameters selected.

In lieu of a computerized simulation, a graphic method was selected to determine the dispersion of CO and the subsequent ambient air quality. This method is called the "Simplified Analysis Technique for Estimating Carbon Monoxide Concentrations Near Highway Facilities;" the method was published by the Federal Highway Administration, May 15, 1975, and is based on the California Line Source Dispersion Model. This model assumes the worst

meteorological conditions. Constants for wind speed and wind directionality are assumed, and the road is assumed to be at grade at a low altitude. Parameters that also are required are the peak hour traffic volume, traffic speed, and the distance from the corridor at which the ambient air will be analyzed.

In using this model, it will be assumed that ambient air quality at the present traffic level is excellent, i.e., that there is a negligible amount of measurable pollutants. The projected maximum traffic will be examined for the "worst case" and "most probable case" of resultant air quality. It is believed that 1985 conditions will be the most critical. Prior to this year the traffic volume will be less; after that year, vehicle volume will continue to rise but will be more than offset by improved technology and more stringent emission regulations, so that total pollutant emissions are expected to level off or even decrease. In other words, it is assumed that 1985 will have the maximum airborne emissions.

**CASE A: WORST METEOROLOGY CASE**

Assumptions:

- (1) Stability Case - F (Note: Hawaii seldom has an F stability)
  - Wind Direction = 22.5° from road.
  - Wind Velocity = 1 meter per second.
- (2) Maximum Hourly Traffic Calculated = 992.  
(20 years from project initiation).
- (3) Expected Traffic Speed = 35 mph.
- (4) Heavy Duty Vehicle Percentage (over 6000 lbs. gross weight) = 10%.
- (5) Projected Year = 1985.

Calculations (from enclosed graphs)

$$\text{Concentration Adjusted} = \left( \frac{\text{Concentration Unadjusted}}{\text{Distance Adjustment}} \right) \left( \frac{\text{Vehicle Mix Adjustment}}{\text{Time Adjustment}} \right)$$

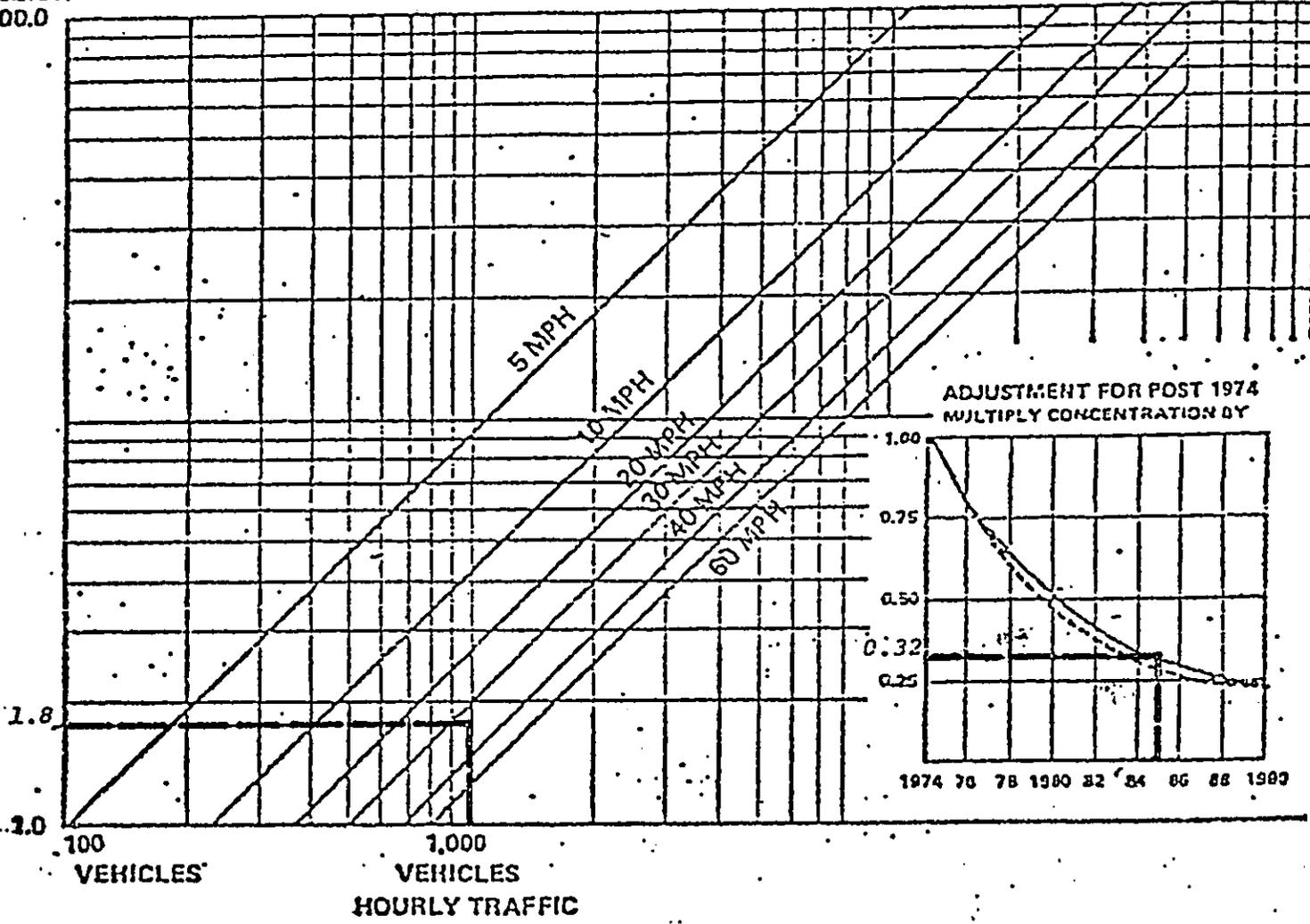
$$= (1.8 \text{ ppm}) (\text{adjustment}) (1.0) (0.32)$$

# CARBON MONOXIDE

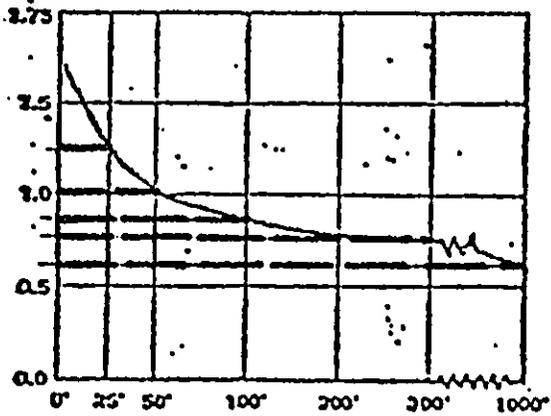
WORST CASE, 1974, 50 FEET FROM HIGHWAY 10% HDV

CASE A: WORST METEOROLOGY CASE

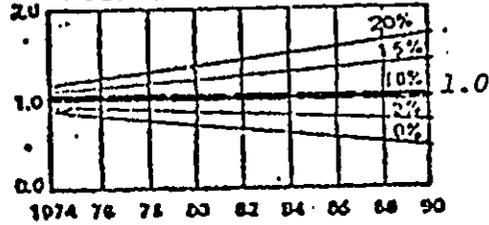
PARTS  
PER  
BILLION  
100.0



ADJUSTMENT FOR DISTANCES OTHER THAN 50'  
MULTIPLY CONCENTRATION BY:



ADJUSTMENT FOR OTHER THAN 10% HDV MIX  
MULTIPLY CONCENTRATIONS BY:



Results:

<u>Distance (ft)</u>	<u>Distance Adjustment</u>	<u>Concentration of CO (PPM)</u>
25	1.25	.72
50	1.00	.58
100	0.88	.51
300	0.77	.44
1000	0.61	.39

CASE B: MOST PROBABLE CASE

Assumptions:

(1) Stability Case = D.

Wind Direction = 45° from road.

Wind Velocity = 9 mph or 4 meters per second.

(2) Worst Case Concentration at 50 feet  
(from previous CASE A) = 1.11 ppm.

Calculations:

Most probable concentration =

(Worst Case Concentration at 50 ft.)	(Stability Adjustment for Class D)	(Wind Angle Adjustment)	(Wind Speed Adjustment)
= (0.58 ppm)	(Stability Adjustment) (.54)	(.25)	

Results:

<u>Distance (ft.)</u>	<u>Stability Adjustment Class D</u>	<u>Concentration of CO PPM</u>
25	.85	.07
50	.81	.06
100	.79	.06
300	.75	.06
1000	.65	.05

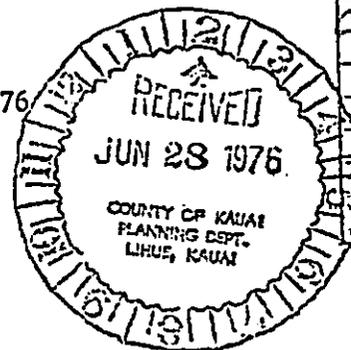
These projected levels are below the State Ambient Air Quality Standard for one hour of  $10 \text{ mg/m}^3$  or 8.4 ppm of CO (at 760 mm HG, 25°C).

We know of no methodologies presently available to determine the concentrations of other pollutants, such as  $\text{NO}_x$ ,  $\text{SO}_x$ , and particulates. However, based on the negligible projected quantities of CO, it is our conclusion that the ambient air quality will not be greatly effected by these other pollutants due to future automobile emissions at Poipu.

AMERICAN  LUNG ASSOCIATION of Hawaii

June 25, 1976

Mr. Brian Nishimoto, Director  
Kauai Planning Department  
4280 Rice Street  
Lihue, Hawaii 96766



Dear Mr. Nishimoto:

Subject: Environmental Impact Statement for the Proposed  
Kiahuna Golf Village

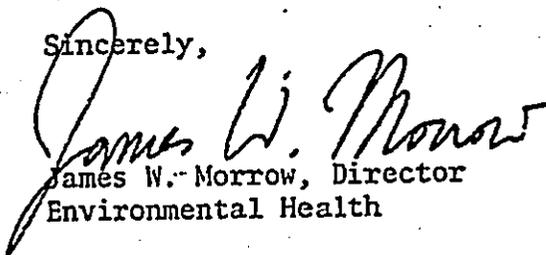
We have reviewed those portions of the subject EIS which pertain to air quality impact and our detailed comments are attached.

In summary, we would note that the EIS preparers did not respond specifically to any of our comments on their draft air quality impact section. In fact, their original draft is included unchanged in the final EIS (pp. 254-265) despite the fact that it contains a number of factual errors some of which are inconsistent with federal regulations (40 CFR Part 85). This only lends credence to our January 14, 1976 letter in which we noted that once draft EIS's are printed, substantive changes are difficult to effect.

Apparently, in response to our comments on the draft, the consultants did prepare a revised and more technically sound analysis. It is difficult to understand why, after going to such trouble, they would relegate this revised analysis to the public comment and response portion of the EIS (pp. 345-361) leaving the incorrect original analysis within the main body of the statement.

We trust that the technical and factual errors in this EIS will be corrected before it is approved by your agency.

Sincerely,

  
James W. Morrow, Director  
Environmental Health

JWM:ct

cc: Belt, Collins and Associates  
Dr. Richard E. Marland

AMERICAN LUNG ASSOCIATION OF HAWAII

Review of the Environmental Impact Statement  
For The Proposed Kiahuna Golf Village

1. Generation of Automotive Emissions (p. 259): Our original comments on the draft EIS still apply (see p. 341 of the Final EIS). Some of the standards listed are incorrect. See federal regulations (40 CFR Part 85). Furthermore, the use of standards as emission factors is wrong and results in an underestimation of emissions. See EPA publication AP-42.
2. Conclusions (p. 262): Again, our comments on the draft apply (see p. 341 of the Final EIS). The conclusions are simply not supported by the calculations that precede them.
3. Pages 262-263: Our comments on the draft EIS still apply (see pp. 341-342 of the Final EIS). Carbon monoxide (CO) is not readily oxidized in the atmosphere but remains unchanged for months and even years. See EPA publication AP-62.
4. Page 264: Our comments on the draft apply. See p. 342 of the Final EIS.
5. Page 274, third paragraph: The statement is made that "...as indicated in this report's Section V, which analyzes adverse environmental impacts, it is not anticipated that the project's additional vehicles will have a significant effect on ambient air quality." This is of questionable validity due to the errors noted in comments 1 through 4 above.
6. Dispersion Analysis (pp. 356-360):
  - a. Page 358: Why was a speed of 35 mph used when the speed used in the emissions analysis was 19.6 mph? Higher speeds result in lower ambient estimates.
  - b. Pages 356-359: Why did the EIS preparers go to such lengths trying to explain why Gaussian diffusion modeling could not be used and then go ahead and use a simplified technique based on a Gaussian model?
  - c. Pages 358-360: The simplified method presented gives rather low estimates which is consistent with the California model on which it is based. The California model yields about the lowest estimates of all Gaussian line source models currently in use. Had the preparers chosen the method described in EPA's publication on Evaluating Indirect Sources, their worst case estimates might have been as much as 5 to 6 times greater than those presented on p. 360.

LH m!  
UV a  
FL

July 2, 1976

Mr. James W. Morrow, Director  
Environmental Health  
American Lung Association of Hawaii  
245 North Kukui Street  
Honolulu, Hawaii 96817

Dear Mr. Morrow:

Kiahuna Golf Village  
Environmental Impact Statement

We acknowledge your concern regarding the location of your earlier comments and our response in the draft EIS. Contrary to your implication, the EIS was not printed prior to the receipt of your comments.

We would like to thank you for your comment "... the consultants did prepare a revised and more technically sound analysis" and appreciate your suggestions in helping us to do so.

Attached you will find our response to your most recent comments.

Sincerely yours,

*JRB*  
James R. Bell

JRB:gk

cc: Brian Nishimoto  
Richard Marland  
Robert Harmon

Attachment

Kiahuna Golf Village  
Environmental Impact Statement  
Response to April 9 and June 25, 1976 Comments  
of James W. Morrow

---

A. Letter of April 9, 1976 (attached)

- 1a. This was not used in our latest valuation.
- 1b. This standard is located in AP-42, Supplement No. 5, and uses grams per mile.
- 1c. We used the standard in 1b above, which makes no reference to 16 g/mi. for diesel.
- 1d. Acknowledged.
- 1e. Page 352 shows breakdown.
- 2. We assumed that bus movement would be negligible and used the latest, albeit soon to be revised standards.
- 3a. We feel that the station at Makahuena Point was not indicative of site parameters and chose instead to assume conditions we feel are generally representative of the site.
- 3b. Acknowledged.
- 3c. We used a method that we feel is justified based on the magnitude of the project.

It is our feeling that the number of vehicles generated by the development of the site will not be significant in terms of automotive emissions, and the computerized dispersion model is not warranted. Also, according to Dr. Anders Daniels, Meteorology Department, University of Hawaii, the HIWAY model requires extremely accurate climatological data which is not available for the site and, therefore, results would be questionable. In lieu of this, we have attempted to show, using a less sophisticated method based on the model for rural situations, what these various parameters could be for the project. We agree that a more sophisticated analysis may be necessary for significant automobile operating projects (i. e. freeway, major highway, etc.); but, because the proposed development is not expected to generate a significant number of vehicles, we feel the less sophisticated approach is justified.

4. Acknowledged. We feel that assumed wind directions based on experience in the area are justified.

B. Letter of June 25, 1976 (attached)

1-5. Answered above.

6a. Thirty five miles per hour is posted speed limit. The emissions table is based on a 19.6 mph speed; however, if we had used the 35 mph speed, the emission factors would have been lowered by a factor of 0.6.\*

6b. We were attempting to show why the more sophisticated process was not used. We apologize for not making this clear.

6c. Acknowledged.

\*AP-42, p. 3.1.1-5

Belt, Collins & Associates  
Honolulu, Hawaii  
July 2, 1976

ARCHAEOLOGICAL RESEARCH CENTER HAWAII, INC.

P. O. Box 285; Lawai, Kauai, Hawaii 96765; Ph. 332-8521

14  
June  
1976

Dr. Richard E. Marland, Director  
Office of Environmental Quality Control  
Office of the Governor  
550 Hale Kauwila Street  
Room 301  
Honolulu, Hawaii 96813

SUBJECT: Kiahuna Golf Village, Poipu, Kauai;  
Moana Corporation, County of Kauai,  
E.Q.C. Bulletin, Vol. II, No. 11,  
June 8, 1976.

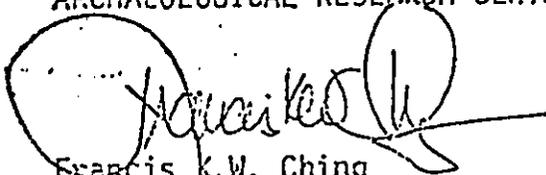
Dear Dr. Marland:

There have been no archaeological surface survey conducted on the above subject project to date. An archaeological reconnaissance was performed by the B.P. Bishop Museum in 1974. The sites located on the above subject properties are on the State Register as "Reserve" and therefore, further archaeological work is necessary before any development takes place. Our concern is that the necessary archaeological work be performed in accordance with State law.

If you have any questions concerning the above, please do not hesitate to contact me.

Very truly yours,

ARCHAEOLOGICAL RESEARCH CENTER HAWAII, INC.

  
Francis K.W. Ching  
President

FC: rlh

July 15, 1976

Mr. Francis K.W. Ching, President  
Archaeological Research Center Hawaii, Inc.  
P. O. Box 285  
Lawai, Kauai, Hawaii 96765

Dear Mr. Ching:

Kiahuna Golf Village

This letter is in response to your comments on "Part II - The Physical Impacts of Kiahuna Golf Village" of the Kiahuna Golf Village Environmental Impact Statement.

Further archaeological site surveys will be undertaken prior to the implementation of the proposed project, upon recommendations from the Historic Preservation Officer, Department of Land and Natural Resources.

If there are additional questions, please contact us.

Sincerely yours,



Joseph Vierra, Jr.

JV:kko

cc: Brian Nishimoto  
Robert Harmon

**BERNICE P. BISHOP MUSEUM**

**RECEIVED**

MAR 26 1976

BELT, COLLINS & ASSOCIATES, LTD.

P. O. Box 6037, Honolulu, Hawaii 96818 • Telephone 847-3511  
March 23, 1976

Mr. Robert L. Harmon  
President  
Moana Corporation  
451 Jackson Street  
San Francisco, California 94111.

Re: Comments on preparation of  
Environmental Impact Statement  
for Moana Corporation's proposed  
Kiahuna Golf Village project at  
Poipu, Kauai.

Dear Mr. Harmon:

The following are my comments on aspects of the natural history of the proposed development area. Since my discovery of unique and specialized cave organisms in the Hawaiian Islands I have been conducting a biological survey of the State's caves with the Bishop Museum. I have made 2 brief trips to caves within the development area and consider the area's caves poorly known. I strongly recommend that a thorough biological survey be done in the caves within the area.

It is with some trepidation that I make the existence of these rare cave animals known, as such publicity is a double edged sword. On one side you need the information to intelligently plan your development, but on the other side the publicity may lead to increased visitation and disturbance by the curious, thus jeopardizing their survival further.

The Koloa area is one of the more interesting areas of the State, both geologically and biologically. The surface is composed of the weathered surfaces of the younger lava flows of the Koloa volcanic series, the youngest posterosional flows on Kauai, and dated at 600,000 years old.

The Koloa lavas, both within and in the vicinity of the development area, contain many lava tubes. Most of these are short remnant sections of once larger caverns, but a few are deep and large enough to still support an endemic biota. At least 2 of these specialized animals are among the most remarkable cave animals in the world. One of these, Adelocosa anops Gertsch (1973), is known from only a single lava tube just outside of the development area. The other species, being described by Bousfield and Howarth (in press), is a blind terrestrial amphipod (beachhoppers or sandhoppers), and is known from the same cave system as Adelocosa anops and other caves nearby. Due to their extremely restricted distribution, when properly named, application will be made to include both of these species under the protection of the rare and endangered species law of 1973.

Although no biologically rich caves are now known within the development area, there is great potential that some will be discovered, along with the possibility of discovery of additional endemic specialized animals. I strongly recommend that a thorough biological survey be done in the caves within the area. Most if not all of these caves are also potentially of importance as archeological resources as well, and it should be possible to coordinate the biological survey with the detailed archeological survey.

It should be noted that these caves no doubt supported a rich cave biota before the advent of man to these islands. Most of these species are probably extinct and were never collected. Only these 2 species, one a general predator and the other a general scavenger, are known to remain. Whether these 2 will also be doomed to extinction rests now on the current generation.

Sincerely yours,

Francis G. Howarth, Ph.D.  
Entomologist

cc.  
Hawaii Environmental Quality Commission  
Belt, Collins & Associates, Ltd.

LH M  
JV  
File  
75-10-01

April 21, 1976

Dr. Francis G. Howarth, Ph.D.  
Bernice P. Bishop Museum  
P. O. Box 6037  
Honolulu, Hawaii 96818

Dear Dr. Howarth:

In response to your concern that there may be caves within the area of Moana Corporation's planned resort residential community at Poipu, Kauai, which have biological significance, we have consulted with Aid Sinoto, the Bishop Museum archaeologist who did the preliminary studies on the site.

Mr. Sinoto indicated that there may be as many as three caves and that he will send us the general location of these caves on a site map. If, after a thorough inspection of these caves is undertaken and it is determined that they are worthy of preservation, they will be preserved as part of the landscape plan. The inspection will be done as part of preparing more detailed plans on the project after General Plan review.

We appreciate your concern. If there are any further comments, please let us know.

Sincerely yours,

JRB

James R. Bell

JRB:gk

cc: Robert Harmon  
Mike Vance

APPENDIX G

SPECIAL INTEREST GROUP CONCERNS

Section VII, Relationship Between Short-Term Uses and Long-Term Productivity, sets forth ten principal concerns expressed of residents of the Koloa-Poipu area as determined by a survey taken in 1974 by Robert Anderson of the University of Hawaii's Center for Nonmetropolitan Planning and Development.

As a supplement to that section, a copy of an article which appeared in the July 12, 1976 issue of Kauai's The Garden Island newspaper, is reproduced below as it sets forth some of the specific concerns of the 'Ohana o Maha'ulepu group with respect to the Kiahuna Golf Village.

Their concerns are recognized, and in some instances (housing, State and County revenues, jobs) it is believed that the responses in Appendix F provide answers to the expressed concerns. In other instances, and principally regarding the social impacts, Moana Corporation can only acknowledge that there will be some changes and adverse aspects associated with the project as development progresses. This can be expected of any project of this magnitude. Moana Corporation is confident that the social and economic benefits which will be derived from the development will offset most, if not all, adverse impacts. Further, Moana Corporation is committed to take every realistic step to mitigate or reduce the degree of adverse social situations and conditions that are related to the Kiahuna Golf Village.

RECEIVED

JUL 16 1976

THE GARDEN ISLAND - MONDAY, JULY 12, 1976 - PAGE 3

HEI, COLLINS & ASSOCIATES, LTD.

# 'Ohana challenges Moana environmental statement

The 'Ohana o Maha'u'epe has taken issue with the environmental impact statement on Moana Corporation's plans for a resort complex between Koia and Poipu, concluding... "It is the local working people who will have to pay in the end."

Speaking for the 'Ohana, Miriam Wong attacked the conclusion in the EIS that "the development of 1,500 condo units, 300 houselets, a resort shopping center and an 18 hole golf course would have no significant bad effect on the present community and would financially benefit the State and County governments and the public."

"But the report doesn't tell the public about workable alternatives to the resort. Following the alternatives could prevent thousands of outsiders from moving into the area and make it unnecessary to rezone any more land for resorts," Miss Wong said.

The 'Ohana statement excerpted what they called the "main issues" in the EIS (printed in bold type) and replied to each of them:

## HOUSING

"The Moana Project will af-

ford an opportunity to meet a substantial portion of the presently unmet demand for permanent housing for Kaula residents." (EIS p. 17)

None of the development's 300 houselets would be sold in fee simple. There will only be leasehold. Also, the report estimates only 25% of the lots are affordable by Kaula residents... all the rest going to outsiders.

Very few if any of the Kaula people most in need of permanent homes - those who are now renting their homes - would be able to afford even the lowest priced lots.

## STATE REVENUES

"The cumulative revenue (during the 15 years until completion of the project) to the State will be \$5,354,000... After the project is fully developed... revenues to the State are estimated to be \$293,000 annually." (EIS p. 19-20)

A hotel room tax of only 50¢ per Kaula hotel room per night would result in the same income to the State without the big development by Moana.

## COUNTY REVENUES

"The estimated net cumulative revenues to the County from the project upon its completion (in 15 years) will be \$12,447,000. After the project is fully developed, public revenues to the County of Kaula are estimated to be \$1,171,000 annually." (EIS p. 19-20)

The County though would be able to collect the same amount of revenue by raising the taxes on resort-developed and resort-zoned land. It would take the Legislature to allow increasing only resort land, but we would work to encourage the Legislature doing this.

## JOBS

"During the Moana Project's 15 year period of condominium construction, the project will generate an average of 105 jobs annually. Upon scheduled completion of the condominiums in 15 years, the Moana Project will provide at least 390 permanent jobs." (EIS p. 20)

The report doesn't mention though, that when building is paid, 105 construction workers will be un-

employed.

Concerning the development's permanent jobs, the need for those kinds of jobs can more than be met without rezoning any more land in Koloa-Poipu for resorts. Right now there are about 100 acres of land in Poipu already zoned resort. Full development of these 100 acres will provide at least 2,000 permanent jobs.

## SOCIAL IMPACT

The report says the development would increase Koloa-Poipu's population by about 2,700 people, but that there would be practically no bad ef-

fects on the local lifestyle as a result. (EIS p. 21-27)

But the report minimizes the population increase and, along with it, the impact on the community.

A more realistic population figure is 4,000, based on the number of condos units, houselets and jobs generated by the development. These 4,000 would way outnumber and would undermine the present Koloa-Poipu community of only about 2,000 residents.

Traffic in the area would be awful. The beaches will get overcrowded. The problem of getting access to the beach is already

bad and will only get worse. State and County costs will increase for such things as roads to take care of all the new people.

Eventually the local residents will have to pay higher taxes, which usually results in higher rents, evictions, and pressure on primarily the small landowners to sell or develop their land.

The increase in population will be due to the influx of mainlanders and the wealthy who can afford the luxuries of the Moana development, not local working people. Yet it is the local working people who will have to pay in the end.