Appendix N

Market Support for Real Estate Development

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MARKET SUPPORT FOR REAL ESTATE DEVELOPMENT AT LA'AU POINT, MOLOKAI

Prepared for

Molokai Properties Limited

Prepared by

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June 2006

SECTION I
INTRODUCTION

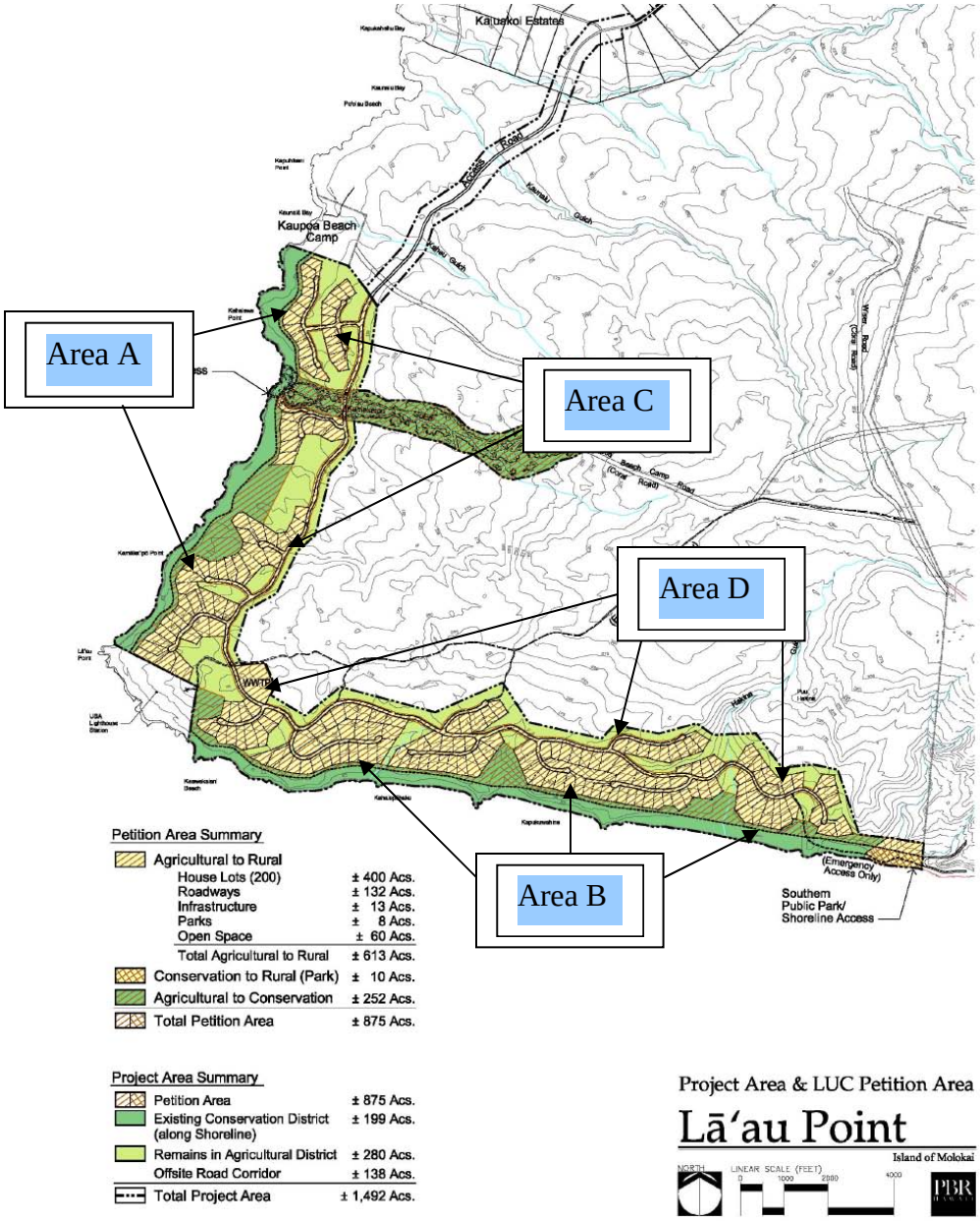
Knowledge Based Consulting Group (KBCG) was retained by Molokai Properties Limited to address the market opportunities for lot sales and residential development at its La'au Point property on Molokai.

Molokai Properties Limited proposes to develop 200 residential lots at La'au Point as part of an overall development and preservation plan for some 1,492 acres within the Molokai Ranch. The La'au Point site slopes from an elevation of sea level to 150 feet, providing good to excellent ocean and countryside views from nearly all development parcels.

The La'au Point development project includes four general lot type areas:

A	West Facing Ocean Front Home Sites	40
B	South Facing Ocean Front Home Sites	58
C	West Facing Ocean View Home Sites	28
D	South Facing Ocean View Home Sites	74
Total Lots and Residences		200

Molokai Properties Limited would construct roadway improvements servicing the site, major electrical improvements, water and sewage treatment facilities, drainage, and other improvements to service the development. An illustrative development plan is shown below:



KBCG recognizes that Molokai Properties has a unique opportunity to develop and deliver a real estate product that builds on the natural character of the land and its uncrowded oceanfront setting. During the course of the assignment we worked with the management team and land planner PBR HAWAII to refine a land plan that is designed to provide oceanfront and near ocean lots with views, privacy, and Hawaiian authenticity not easily found elsewhere in Hawaii.

In conducting the assignment, KBCG reviewed the overall real estate market in Hawaii, the development programs at other oceanfront developments in the region, current site opportunities, and overall market strength. The site is at a preferred location fronting unspoiled beaches of remarkable strength and beauty. On the western side, the property is near to the Kaluakoi resort and golf course and the lots have beautiful sunset views and distant Oahu vistas. The south facing lots also have excellent ocean views and access to large areas of open space and recreation opportunities.

In conducting our analysis, KBCG began by examining the base land use plan that had been developed by PBR and Molokai Properties. This plan reflects the constraints and opportunities inherent in the land as well as a program of covenants and conditions that are acceptable to the Molokai community. We understand that the plan and its conditions reflect extensive community involvement. Within this context we addressed the following issues:

- What is the expected market demand for a low density, natural environment lot program at La'au Point?
- What design features and amenities will be particularly appropriate for the La'au Point market?
- What is a responsible pricing strategy for the La'au Point lots?
- What are the CC and R's that are appropriate for the La'au Point market and how will they affect value?

In particular, the KBCG work program included the following tasks:

- Evaluate site opportunities and constraints in terms of oceanfront proximity and setbacks, view orientation, infrastructure development, land planning options, potential building envelopes, and design considerations.
- Analyze existing supply and projected future demand for oceanfront and ocean view lots in Hawaii and at the subject site.
- Review the projected supply and performance of comparable ocean oriented lots within selected Hawaii resorts and land sales projects. Particular attention was given as to how the uncrowded, natural character, and protective CC and R's of the La'au Point project relate to other alternatives in the market.
- Evaluate the market of buyers who by their purchase behavior indicate that they could be candidates for La'au Point real estate. Accordingly, we analyzed assessor records to evaluate buyer origin, occupancy patterns, turnover, and sales price history for individual properties within projects that offer ocean oriented estate lots.
- Recommend a development program, pricing structure and absorption schedule for La'au Point.

Following this Introduction, Section II presents a summary of target markets and market support as well as recent overall market performance and specifics of comparable and competitive projects. The recommended development program is summarized in Section III. Appendices A, B, and C provide summary information on selected oceanfront real estate projects within Wailea, Kaananpali, and Kapalua respectively, and Appendix D summarizes real estate activity on Molokai since 2000. This assignment was conducted by Clive B. Jones, Principal, with administrative support from Megan Jones. KBCG appreciates the fine support and cooperation from Molokai Properties executives and line personnel throughout the assignment.

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GENERAL LIMITING CONDITIONS

Every reasonable effort has been made to ensure that the data contained in this study reflect the most accurate and timely information possible, and they are believed to be reliable. This study is based on estimates, assumptions and other information developed by Knowledge Based Consulting Group from its independent research effort, general knowledge of the industry and consultations with the client and the client's representatives. No responsibility is assumed for inaccuracies in reporting by the client, the client's agent and representatives or any other data source used in preparing or presenting this study.

This report is based on information that was current as of April 2006 and Knowledge Based Consulting Group has not undertaken any update of its research effort since such date.

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This study is qualified in its entirety by, and should be considered in light of, these limitations, conditions and considerations.

SECTION II

MARKET ENVIRONMENT FOR LA'AU POINT REAL ESTATE

This section of the report summarizes current market conditions for resort real estate on Molokai and at the principal West Maui resort communities of Wailea, Kaanapali, and Kapalua

Overall Market Environment

The market for real estate at La'au Point will be comprised of households that recognize the value of an unspoiled oceanfront environment in Hawaii and have the resources to afford it. For the ocean view lots, this would generally require a net worth of at least $1 million, and for the ocean front properties the market for real estate at La'au Point comes from the premium pentamillionaire ($5 million) market and above

- Nationwide, the number of households with more than $1 million in net worth (not including primary residence) tapered from its peak of 7.1 million households in 1999 to 5.5 million at the end of 2002.
- Since March 2003, equity markets have regained earlier strength such that substantial gains have been realized in the equity markets, and real estate assets have continued to climb. The number of millionaire households has now reached 8.3 million and is increasing at the rate of 700,000 per year.
- Notwithstanding short term influences, the assets of high net worth individuals should substantially exceed worldwide economic growth and grow at an average of 7% a year during the next 3 years, reaching approximately $38 trillion by 2008.
- As stock market gains evaporated in the early part of this decade, consumers began to look at housing with a renewed appreciation, making real estate and other assets a safe haven for money. They also learned to appreciate that another form of safe haven is a desirable location for themselves and their real estate when they retire. Hawaii fits this profile ideally, and anecdotal discussions with real estate brokers indicate that this safe haven motivation is already quite strong in the Hawaii market.
- The average HNW individual has about 15% of his assets in real estate, not counting the primary home.
- The pentamillionaire market has pulled back about 20% since the heady days of the late '90's, but is regaining forward momentum in 2006.
- The number of pentamillionaire households is currently about 500,000 and increasing at a rate of about 20,000 to 25,000 per year. By 2020, there should be nearly 1 million pentamillionaire households in the United States
- An increasing share of the pentamillionaire market will be represented by inherited wealth being transferred to the Baby Boomer generation.

Conclusion: There is sufficient depth of market for La'au Point and that market is growing at a healthy rate.

Key Market Segments

- Transfer Market. This market includes existing owners at Kaluakoi, other Molokai seasonal home owners, owners at the principal Maui resorts, and owners at premium Neighbor Island projects
    - Interest in the real estate market and looking at new real estate products is a popular activity with existing owners of Hawaii resort homes and lots. This transfer market represents qualified and interested resort real estate owners who have already made a purchase decision to own a home in Hawaii. Some of these owners are looking to change projects for the following reasons:
        - Congestion and crowding at key amenities
        - Homes or condominium units are too small
        - Views are compromised
        - Too far from beach
        - Decline in quality of service
        - Or, they are looking for additional investment opportunities
    - Prior KBCG surveys of owners at West Maui and Big Island resorts indicate that there could be a significant opportunity to draw buyers to an uncrowded oceanfront experience at La'au Point from the Wailea, Kapalua, and Kaanapali resorts and (to a lesser extent) from the Big Island.
- On –going Market
    - Frequent Visitors to Molokai and Maui
    - Single family home, luxury condominium, and other hotel suite renters
    - Friends and relatives of existing second home owners
    - The Baby Boomer Market should sustain growth in the Hawaii real estate market
        - Relocation in retirement is on the horizon for many baby boomers with nearly 6 out of 10 likely to move to a new home for retirement.
        - Of those planning to move, 31% plan to move more than three hours away from their current location.
        - Hawaii is the preferred destination of 4% of the prospective Baby Boomer retirees. Whereas this may be considered a small percentage, the potential numbers are impressive. If they fulfilled their dreams, these goals represent 20,000 to 40,000 baby boomer households relocating to Hawaii per year.
        - Health, fitness, family, and safety are on point messages to the resettling Baby Boomers.
        - Nearly all boomers (90%) believe they will be happier if they remain physically active during retirement. Their principal activities include walking, swimming, and using exercise facilities.

- Most boomers (91%) expect that the U.S. fight against terrorism is not expected to subside any time soon, as most boomers feel the war will continue into their retirement.
- Hawaii's position as a probable safe haven from future terrorism events should continue to appeal to these semi-retiring baby boomers and help real estate sales.
- They are also looking forward to spending more time with spouse, children, and grandchildren.
- An approach to framing a healthy, self improvement lifestyle through a clean and unspoiled environment with supporting amenities and community services is well targeted to the needs of semi-retiring Baby Boomers

- And, Hawaii is Tax Friendly to Retirees
  - Hawaii is the most friendly State for retirement assets. – Bloomberg Wealth Management
  - The average annual tax bill for a reasonably well off retiree in Hawaii is $4,049, lowest in the country. Some comparisons: Florida: $9,351; Arizona: $8,308; New York: $14,571; California: $11,250
  - Also, Hawaii is the second friendliest state for wealth held in real assets. The average annual tax bill is $11,124, just behind Wyoming. Some comparisons: Florida: $20,869; Arizona: $15,008; New York: $31,837; California: $19,597
  - This message can be a positive counter to the prevailing impression of Hawaii as a high cost of living state.

Maui County Real Estate

Over the past several years there has been a dramatic increase in real estate activity throughout Hawaii. This is particularly true for resort destinations in Maui, and Molokai itself has seen substantial sales growth and price appreciation. Each of these areas are discussed below.

Maui resort condominiums reached their previous peak prices in 1990/1991, the last two years of the Japanese "Bubble" economy. From 1991 to 1997, prices declined some 30% to 40% from those peaks. However, all South Maui luxury condominiums have seen very substantial price rises the past few years, especially in the past 24 months, to the point that all prices have now risen far beyond those 1990/1991 peaks, to new all-time highs. The luxury complexes in Wailea, Makena, Kaanapali, and Kapalua have seen especially good price appreciation over the past 24 months. Inventories are very low, and in some complexes are continuing to decline further, indicating that the boom is not yet over. However, in late 2005 and early 2006, the market has leveled off indicating that price increases may have overshot demand. This will most likely result in a slight pullback in the overall market in the short term as speculative activity subsides. However, for the long term the basic market drivers outlined above should sustain the market for well located and unique oceanfront properties well into the future.

Overall Performance (Table 1)

- Total real estate sales in the three principal West Maui resorts (Kapalua, Kaanapali, and Wailea) was about $711.1 million in 2005, up from $645.2 million in 2004.
- In terms of units, the resort market is about 2/3 condominiums, 11% lots, and 22% single family residences.
- In terms of value, the mix is led by villas/ condominiums (49% of resort real estate sales) followed by single family residences (38%).
- Lots are a relatively small part of the Maui resort real estate market (11% of units and 13% of sales). In most cases, this reflects a lack of well positioned lot inventory.
- This distribution of real estate sales on Maui is very different than that on the Big Island resorts, where lots are 45% of sales and residences are a relatively small share of the market.

By Resort

- Wailea/ Makena had the highest number of sales, 237 in 2005. Wailea also captured the most value, $374.6 million for a 53% market share.
- Kaanapali had 221 sales distributed across condominiums ($142 million), lots ($14.9 million), and residences ($50.8 million) for a total of $207.7 million.
- Kapalua had 69 sales for $128.7 million.
- The top resorts across Hawaii in terms of real estate sales in 2005 were Wailea ($374.6 million), Kukio ($340.6 million), Mauna Lani ($252.6 million), Kaanapali ($207.7 million), Waikoloa ($173.4 million), Hualalai ($143.2 million), Kapalua ($128.7 million), and Mauna Kea ($43.7 million).

By Product within Maui Resorts

- There were 355 villa and condominium sales for a value of $347.5 million. The average unit was 1,162 square feet priced at $979,000 ($859/sq. ft.). This average condominium size is significantly lower than at the Big Island resorts where the average is 1,640 square feet.
- There were 56 lot sales for a value of $91.4 million. The average lot was about 47,000 square feet priced at $1.6 million ($34/sq. ft.).
- There were 116 residence sales for a value of $272.3 million. The average residence was about 3,250 square feet priced at $2.35 million (722/sq. ft.).

Absorption (Tables 2 and 3)

- There were 44 closings per month at the Maui resorts in 2005, down slightly from the hectic pace of 54 units per month seen in 2004

Absorption and Pricing Comparison for 2005 and 2004 (Tables 4 and 5)

- Resort price increases continued at a remarkable pace. Compared to 2004, the price increases in 2005 were:
    - Condominiums. Average prices increased 17% to nearly $980,000 ($859/SF). Range of $756/SF (Kaanapali) to $959/SF (Kapalua).

- Single Family Lots. Average prices increased 38% to $1.6 million ($34/SF). Range of $14/SF (Kapalua) to $61/SF (Kaanapali and Wailea)
- Residences. Average prices increased a remarkable 52% to $2.35 million ($722/SF). Range of $589/SF (Kaanapali) to $837/SF (Kapalua)

- Overall price appreciation was highest at Kaanapali and Kapalua (+35%), followed by Wailea (+31%).
- Combining changes in absorption and price, overall real estate sales volume for the three resorts increased to about $59.3 million per month in 2005, compared to $53.8 million per month in 2004.
- Average unit sizes stayed about the same for condominiums, but increased 9% over 2004 for residences.

Competitive Environment

- The competitive environment for the La'au Point lots residences will be shaped by an extreme shortage of available oceanfront property within Hawaii. This shortage has contributed to rapidly escalating prices. For example, the oceanfront units at the Wailea Beach Villas are reselling in the $6.5 million to $7.5 million range and the two Wailea Point resales in 2005 sold for an average of $4.4 million. This price escalation is also seen on the Big Island with several oceanfront homes at Hualalai and Kukio selling for $10 million and up.
- Most of the new resort real estate inventory on Maui will be in relatively moderate priced products that will not be within comfortable walking distance of the ocean. Recent and projected additions to the West Maui resort inventory include:

Property	Location	# of Units	Completion Date
Planned condominium/timeshare conversions:			
Maui Marriott Resort	Kaanapali	311	October 2005
Kapalua Bay Hotel	Kapalua	155	Spring 2008
Planned additions:			
Westin Ocean Villas	Kaanapali	177	Partially Completed
Intrawest-Honua Kai	Kaanapali	700	Beginning Sales

These projects generally target the condominium and vacation ownership buyer and have little overlap with the La'au Point target market

- La'au Point's competitive advantage lies in delivering its own core values (unobstructed beach and ocean frontage, environmental sensitivity, residential privacy, uncrowded amenities, and the cultural/ family values synonymous with Molokai) with quality and precision.

Price Performance for Oceanfront Condominiums/ Villas in West Maui Resorts

Since the La'au Point lots and residences will be one of the few oceanfront properties available in Hawaii, KBCG examined the sales history of selected oceanfront properties on Maui since 2000. These included front row units at the following projects.

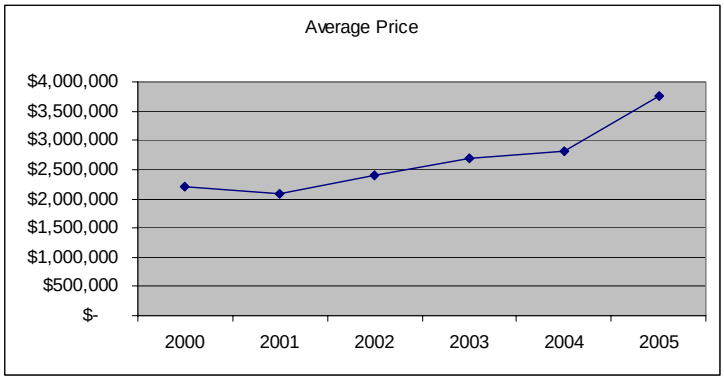
Wailea/ Makena	**Kaanapali**	**Kapalua**
Wailea Point	Ali'i	Ironwoods
Makena Surf	Whaler	Coconut Grove

Each of these oceanfront projects is described in Appendices A, B, and C along with site plans and recent sales history by unit.

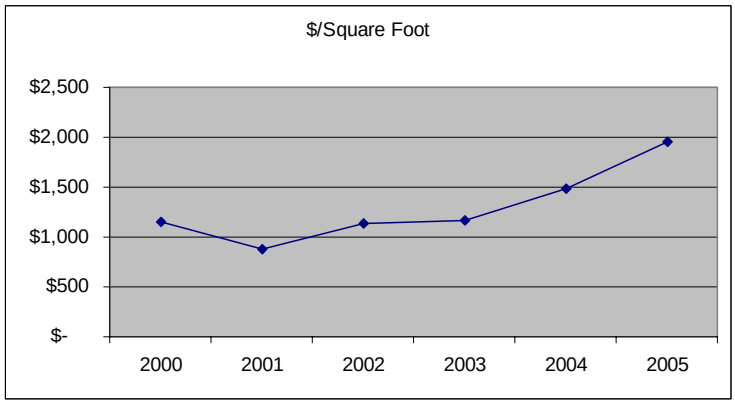
Price History for West Maui Oceanfront Villas

	$/Square Foot	Average Price
2000	$1,158	$2,194,538
2001	$884	$2,096,671
2002	$1,131	$2,396,250
2003	$1,163	$2,693,358
2004	$1,489	$2,810,345
2005	$1,957	$3,766,500

Average prices have risen from just over $2 million in 2000/01 to over $3.7 million

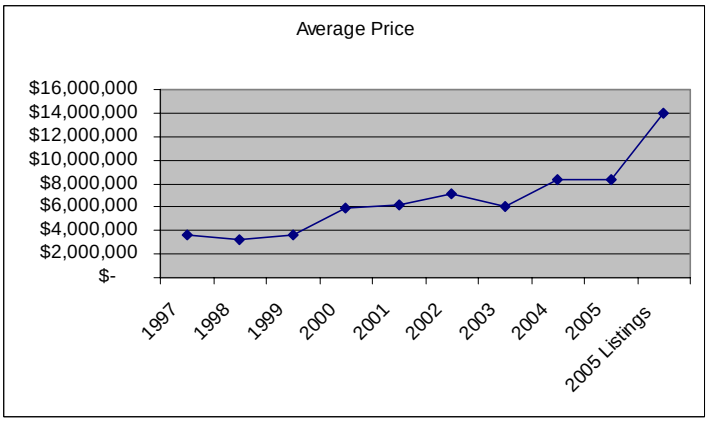


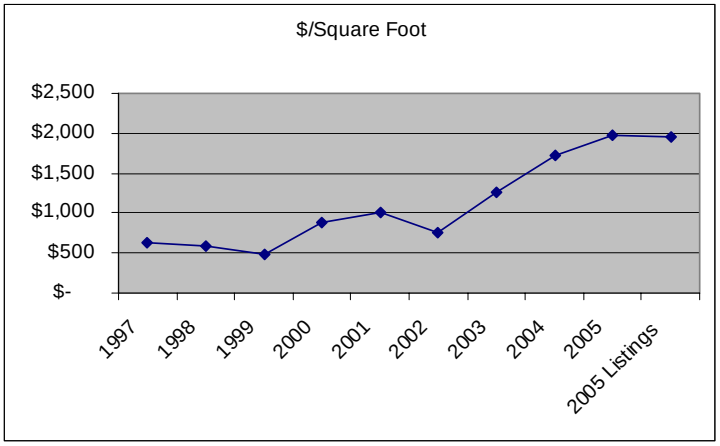
In terms of price per square foot, the average has essentially doubled in five years and now runs around $2,000 per square foot.

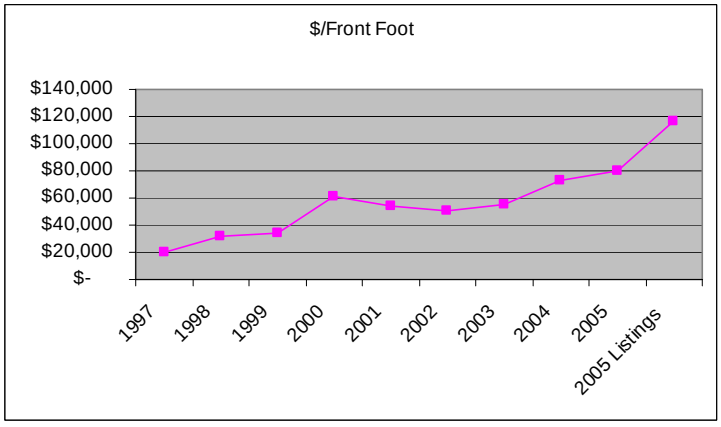


Price Performance for Oceanfront Residences in West Maui Resorts

Since 1997, prices for oceanfront single family homes have essentially tripled in terms of total price and $ per square foot, and quadrupled in terms of value per front foot of ocean exposure.







Theses levels of price appreciation for both condominiums and residences demonstrate very strong market awareness and appreciation of the scarcity and value of oceanfront property.

Molokai Real Estate (Tables 6 and 7)

Whereas Molokai does not have the high density resort products of Maui, it has also seen strong growth in its real estate markets, particularly since the reopening of the Kaluakoi golf course.

- Total real estate sales in Molokai were about $83 million in 2005, up slightly from a record $79.8 million in 2004
- In terms of units, the market is fairly evenly split between condominium resales (69), lot sales (106), and residences (77).
- In terms of value, residences represent $37.8 million, lots represent $27.4 million, and condominiums account for $18.0 million.
- Lots are a major part of the Molokai real estate market (40% of units and 35% of sales).
- This distribution of real estate sales on Molokai is similar to that on the Big Island resorts, where lots are 45% of sales.

For Kaluakoi

- Kaluakoi had 65 sales or resales for $34.1million in 2005. These included 32 condominiums ($9.3 million), 25 lots ($12.6 million), and 8 residences ($12.2 million)
- Kaluakoi sales prices are substantially higher than elsewhere on Molokai. The average price for a lot at Kaluakoi in 2005 was $503,000, compared to $182,000 elsewhere on the island. Residence prices reflect this land value with the average price for a Kaluakoi residence surpassing $1.5 million in 2005.
- Sales volume has increased substantially in the past three years.

	Average Number of Sales per Year			
Period	Condos	Lots	Residences	Total
2000 to 2002	23	8	2	33 per year
2003 to 2005	40	41	8	87 per year

- In addition to the increased volume of sales, average prices and prices per square foot at Kaluakoi in 2005 were also substantially higher than in 2000:

	Percent Increase Over 2000			
	Condos	Lots	Residences	Total
# of Sales	-3%	+127%	+167%	+38%
Sales Volume	+172%	+348%	+919%	+358%
Average Price	+180%	+97%	+282%	
Price/ SF	+153%	+103%	+350%	

Origin of Hawaii and Molokai Real Estate Buyers (Table 8)

- The United States represents nearly 90% of the buyers of resort real estate in Hawaii, followed by Japan at 8%, and Canada at 2%. The large majority of U.S. buyers (74%) are from the Pacific States. The market distributions for Maui, the Big Island, and Molokai are as follows:

Region	Maui	Hawaii	Molokai

East Coast (0-399)	6.1%	6.3%	7.4%
Midwest & South (400-699)	6.9%	6.6%	5.7%
Mountain (700-899)	9.9%	8.1%	9.4%
Southern California (900-938)	13.4%	11.7%	19.1%
Northern California (939-966)	14.1%	21.5%	18.1%
Pacific Northwest (967-969)	25.4%	25.1%	11.7%
Alaska & Hawaii (970-995)	13.2%	9.6%	24.1%

As shown, the islands have reasonably similar origin patterns with Maui doing a little better in Southern California, while Hawaii has a greater proportion of Northern California owners, and Molokai has more owners from within Hawaii

- For individual resorts, the differences in origin patterns are quite substantial:

Resort	First	Second	Third
Maui			
Makena	Northwest (25%)	Alaska/Hawaii (19%)	N. California (16%)
Kapalua	Northwest (20%)	N. California (16%)	S. California (14%)
Kaanapali	Northwest (21%)	S. California (21%)	N. California (18%)
Wailea	Northwest (32%)	Alaska/Hawaii (17%)	N. California (9%)
Hawaii			
Hualalai	N. California (56%)	Alaska/Hawaii (13%)	Midwest/ South (7%)
Keahou	Northwest (27%)	Japan (22%)	Alaska/Hawaii (13%)
Kohala	Northwest (40 %)	N. California (17%)	S. California (14%)
Mauna Kea	Northwest (44 %)	N. California (19%)	Midwest/South (10%)
Mauna Lani	Northwest (20%)	N. California (18%)	S. California (16%)
Molokai			
Kaluakoi	Hawaii/ Alaska (22%)	S. California (19%)	N. California (18%)

- The owners of Kaluakoi real estate reside in a wide geographic region, including other Hawaiian islands. The largest source market is California (37%), followed by Hawaii (22%) and the Pacific Northwest and Alaska (15%). About 10% are Molokai residents. About 5% of the Kaluakoi condo owners live in Canada and there is very little other foreign ownership. For Molokai in general, and La'au Point and Kaluakoi in particular, there appears to be a substantial opportunity for expansion into the Northwest market.

MARKET DEPTH FOR REAL ESTATE AT LA'AU POINT

There is a wide range of resort real estate products in the state of Hawaii, but the consistently highest values are obtained for those properties that have direct access to the ocean and/or unobstructed ocean views. Walking distance to a beach adds an additional lot sales premium.

The principal markets for La'au Point include the opportunity to relocate existing Kaluakoi and Molokai property owners (Local Transfer Market) as well as attract buyers who currently own property elsewhere in Hawaii (Interisland Transfer Market) and bring in new buyers from qualified markets (Ongoing Market). Being able to successfully penetrate the transfer market will be a key factor in La'au Point's initial success. Our market research shows that there is significant potential from this market. The approximate size of the transfer and ongoing markets are shown below:

Depth of Local and Interisland Transfer Market for La'au Point Lots

There are over 500 owners at Kaluakoi and over 6,400 condominiums and single family residences in the principal West Maui resorts. Many of these units were built 15 to 20 years ago and besides being older, they are often smaller than what owners now desire as they spend more time at their seasonal home, and their views may have been compromised as new projects have been developed. Any or all of these factors support the potential for a strong transfer market out of existing resort home properties to the uncrowded natural oceanfront environment that will be preserved at La'au Pont. The potential demand from this transfer market is outlined below: Note that these figures do not include potential buyers from the owners of vacation ownership property on West Maui or owners that have property outside of the master planned resorts.

Depth of Molokai Transfer Market for La'au Point Lots and Residences

	Number of Residences				
	Condominiums		Single Family		Total
Resort	%	Units	%	Units	Units
Kaluakoi		299		225	524
Income and/or Net Worth Qualified Kaluakoi	75%	224	80%	180	404
Number Looking to Switch or Add Real Estate	40%	90	50%	90	180
Percent Looking to Switch from Condo to Single Family	30%	27			
Percent That Would Consider Molokai	80%	22	80%	72	94
Penetration Rate for La'au Point Lots and Residences	60%	15	60%	43	58

Depth of Interisland Transfer Market for La'au Point Lots and Residences

	Number of Residences				
	Condominiums		Single Family		Total
Resort	%	Units	%	Units	Units
Wailea/ Makena		1,642		1,182	2,824
Kaanapali		2,413		376	2,789
Kapalua		564		238	802
		4,619		1,796	6,415
Income and/or Net Worth Qualified					
Wailea/ Makena	75%	1,232	80%	946	2,177
Kaanapali	55%	1,327	70%	263	1,590
Kapalua	90%	508	90%	214	722
		3,066		1,423	4,489
Number Looking to Switch or Add Real Estate					
Wailea/ Makena	52%	640	50%	473	1,113
Kaanapali	49%	650	50%	132	782
Kapalua	75%	381	50%	107	488
		1,671		712	2,383
Percent Looking to Switch from Condo to Single Family	20%	334			
Percent That Would Consider Molokai					
Wailea/ Makena	10%	33	15%	71	104
Kaanapali	8%	27	10%	13	40
Kapalua	10%	33	50%	54	87
		94		138	231
Penetration Rate for La'au Point Lots and Residences	60%	15	60%	83	98

This transfer demand, on its own, seems sufficient to support about 3/4 of the units that are planned be developed at La'au Point

On-going Mainland Market

The size of the Ongoing Market for luxury second or seasonal homes in the price range anticipated for the La'au Point Lots and Residences is based on the number of U.S. households with a net worth of $2.5 million or more including home equity. The size of the market with net worth of $2.5 million+ is

	Number of Households
Northeast States	230,000
Southern States	360,000
Midwestern States	310,000
Western States	300,000
Total Market	1,200,000

This market potential is then adjusted to account for its proximity to Hawaii and the buyer origin distribution at Hawaii resort projects:

	Number of Households
Northeast States (@ 10%)	23,000
Southern States (@ 10%)	36,000
Midwestern States (@ 20%)	62,000
Western States (@ 100%)	300,000
Geographic Market	421,000

Although there is an overall market potential of 421,000 households, not all of them are in the market for additional second home or seasonal home properties.

Available market to purchase new/additional seasonal home (@ 20%)	85,000
Penetration rate for the State of Hawaii (@ 10%)	8,500
Add: Foreign buyers (@ 15% of mainland)	1,275
Add: Local Hawaii Buyers (@ 10% of mainland)	850
Total Depth of Ongoing Demand	10,625
Market Share for Single Family Lots (@20%)	2,125

This demand for luxury properties will have a limited number of oceanfront options to choose from in Hawaii. We expect that the La'au Point Lots and Residences' market share will therefore be quite strong and affected mainly by additional resales that come on the market rather than new oceanfront development.

Molokai Market Share (@15%)	318
Penetration Rate for La'au Point Lots and Residences (@60%)	192

In addition, this market is increasing at about 7% per year.

Resort Guest Conversion

In addition to the ongoing market and transfer market potential, there is the opportunity to convert frequent Molokai hotel guests to real estate buyers. Prior research shows that 50% of frequent Hawaii visitors who do not have a home in Hawaii have a significant interest in owning Hawaii real estate. Of those that annually stayed two weeks or more in Hawaii, 70% are interested. Whereas we do not know the number of frequent Molokai visitors staying at the

Table 1

Summary of West Maui Resort Real Estate Sales, 2004

Resort	Number of Sales	Sales Value	Average Sales Price	Market Share (#)	Market Share ($)	Share of Total (#)	Share of Total ($)
Condos							
Wailea	144	$ 147,226,414	$ 1,022,406	33.5%	41.1%		
Kaanapali	221	$ 140,714,434	$ 636,717	51.4%	39.3%		
Kapalua	65	$ 70,401,000	$ 1,083,092	15.1%	19.6%		
Total	430	$ 358,341,848	$ 833,353			67.5%	55.5%
Lots							
Wailea	48	$ 62,847,990	$ 1,309,333	55.2%	61.9%		
Kaanapali	26	$ 16,730,000	$ 643,462	29.9%	16.5%		
Kapalua	13	$ 21,898,980	$ 1,684,537	14.9%	21.6%		
Total	87	$ 101,476,970	$ 1,166,402			13.7%	15.7%
Residences							
Wailea	82	$ 121,860,800	$ 1,486,107	68.3%	65.7%		
Kaanapali	27	$ 33,035,991	$ 1,223,555	22.5%	17.8%		
Kapalua	11	$ 30,515,000	$ 2,774,091	9.2%	16.5%		
Total	120	$ 185,411,791	$ 1,545,098			18.8%	28.7%
All Resort Real Estate							
Wailea	274	$ 331,935,204	$ 1,211,442	43.0%	51.4%		
Kaanapali	274	$ 190,480,425	$ 695,184	43.0%	29.5%		
Kapalua	89	$ 122,814,980	$ 1,379,944	14.0%	19.0%		
Total	637	$ 645,230,609	$ 1,012,921				

Summary of West Maui Resort Real Estate Sales, 2005

Resort	Number of Sales	Sales Value	Average Sales Price	Market Share (#)	Market Share ($)	Share of Total (#)	Share of Total ($)
Condos							
Wailea	131	$ 148,864,575	$ 1,136,371	36.9%	42.8%		
Kaanapali	178	$ 142,019,454	$ 797,862	50.1%	40.9%		
Kapalua	46	$ 56,572,517	$ 1,229,837	13.0%	16.3%		
Total	355	$ 347,456,546	$ 978,751			67.4%	48.9%
Lots							
Wailea	29	$ 55,355,500	$ 1,908,810	51.8%	60.6%		
Kaanapali	16	$ 14,932,000	$ 933,250	28.6%	16.3%		
Kapalua	11	$ 21,080,000	$ 1,916,364	19.6%	23.1%		
Total	56	$ 91,367,500	$ 1,631,563			10.6%	12.8%
Residences							
Wailea	77	$ 170,467,000	$ 2,213,857	66.4%	62.6%		
Kaanapali	27	$ 50,788,328	$ 1,881,049	23.3%	18.7%		
Kapalua	12	$ 51,015,000	$ 4,251,250	10.3%	18.7%		
Total	116	$ 272,270,328	$ 2,347,158			22.0%	38.3%
All Resort Real Estate							
Wailea	237	$ 374,687,075	$ 1,580,958	45.0%	52.7%		
Kaanapali	221	$ 207,739,782	$ 939,999	41.9%	29.2%		
Kapalua	69	$ 128,667,517	$ 1,864,747	13.1%	18.1%		
Total	527	$ 711,094,374	$ 1,349,325				

Source: KBCG

Table 2
Summary of Resort Real Estate Sales on Maui, 2005

	Condos/ Villas				Lots				Residences				Total					
Resort	Jan - Mar	Apr - June	Jul - Sep	Oct - Dec	Jan - Mar	Apr - June	Jul - Sep	Oct - Dec	Jan - Mar	Apr - June	Jul - Sep	Oct - Dec	Jan - Mar	Apr - June	Jul - Sep	Oct - Dec	2005	Monthly Average
Wailea	32	39	31	29	9	10	3	7	17	27	17	16	58	76	51	52	237	19.8
Kaanapali	40	43	51	44	1	3	9	3	9	7	5	6	50	53	65	53	221	18.4
Kapalua	9	16	13	8	2	3	5	1	3	3	3	3	14	22	21	12	69	5.8
Total	81	98	95	81	12	16	17	11	29	37	25	25	122	151	137	117	527	43.9

Source: Knowledge Based Consulting Group, Hawaii Information Service

Table 3
Monthly Distribution of Maui Resort Real Estate Sales

	Wailea			Kaanapali			Kapalua			Total			
2005	Condo	Lots	Res.	Condo	Lots	Res.	Condo	Lots	Res.	Condo	Lots	Res.	Total Sales
January	9	5	8	9	0	3	2	1	1	20	6	12	38
February	13	4	4	16	0	1	3	0	1	32	4	6	42
March	10		5	15	1	5	4	1	1	29	2	11	42
April	8	1	5	6	1	1	7	1	2	21	3	8	32
May	12	4	9	15	1	4	3	1		30	6	13	49
June	19	5	13	22	1	2	6	1	1	47	7	16	70
July	12	1	7	17	3	2	6	2	2	35	6	11	52
August	11	1	6	14	3		4	2		29	6	6	41
September	8	1	4	20	3	3	3	1	1	31	5	8	44
October	10	4	7	15	2	2			2	25	6	11	42
November	11	2	4	17	1	3	6	1	1	34	4	8	46
December	8	1	5	12		1	2			22	1	6	29
Closed YTD	131	29	77	178	16	27	46	11	12	355	56	116	527

Source: Knowledge Based Consulting Group, Hawaii Information Service

Table 4
Summary of Maui Resort Real Estate Sales by Active Project and Resales, 2004 and 2005

		2004 sales			2005 sales			
Land Use	Subdivision	#	$	Average Price	#	$	Average Price	% change
Wailea								
Villa	Polo Beach Club	1	$ 1,550,000	$ 1,550,000	1	$ 3,000,000	$ 3,000,000	94%
Villa	Polo Beachfront	1	$ 4,019,445	$ 4,019,445	0	$ -		
Villa	Wailea Alanui	4	$ 7,125,000	$ 1,781,250	0	$ -		
Villa	Wailea Point Village	1	$ 4,700,000	$ 4,700,000	3	$ 13,775,000	$ 4,591,667	-2%
Villa	Na Hale O Makena	9	$ 14,885,000	$ 1,653,889	9	$ 16,511,500	$ 1,834,611	11%
Villa	Makena Surf	13	$ 28,886,450	$ 2,222,035	4	$ 9,664,000	$ 2,416,000	9%
Villa	Grand Champion	32	$ 18,092,500	$ 565,391	25	$ 18,088,500	$ 723,540	28%
Villa	Wailea Fairway	15	$ 10,268,000	$ 684,533	18	$ 16,455,700	$ 914,206	34%
Villa	Wailea Ekahi I	5	$ 3,680,000	$ 736,000	6	$ 6,323,300	$ 1,053,883	43%
Villa	Wailea Ekahi II	6	$ 4,982,000	$ 830,333	6	$ 7,680,000	$ 1,280,000	54%
Villa	Wailea Ekahi III	7	$ 4,350,000	$ 621,429	8	$ 7,997,000	$ 999,625	61%
Villa	Wailea Elua I	5	$ 7,609,989	$ 1,521,998	4	$ 6,200,000	$ 1,550,000	2%
Villa	Wailea Elua II	7	$ 9,700,000	$ 1,385,714	4	$ 6,525,000	$ 1,631,250	18%
Villa	Wailea Ekolu	14	$ 8,693,250	$ 620,946	24	$ 18,559,525	$ 773,314	25%
Villa	Palms at Wailea	12	$ 8,392,000	$ 699,333	9	$ 7,748,550	$ 860,950	23%
Villa	Palms at Wailea II	12	$ 10,292,780	$ 857,732	10	$ 10,336,500	$ 1,033,650	21%
	Subtotal	144	$ 147,226,414	$ 1,022,406	131	$ 148,864,575	$ 1,136,371	11%
Land	Maui Meadows	3	$ 1,575,000	$ 525,000	1	$ 758,000	$ 758,000	44%
Land	Kaimanu Estates	1	$ 1,250,000	$ 1,250,000	0	$ -		
Land	Wailea Golf Estates	1	$ 465,490	$ 465,490	0	$ -		
Land	Wailea Highlands				2	3275000	$ 1,637,500	
Land	Palau'ea				8	18590000	$ 2,323,750	
Land	Wailea Kialoa	2	$ 655,000	$ 327,500	2	$ 1,145,000	$ 572,500	75%
Land	Wailea Golf Vistas	26	$ 22,367,500	$ 860,288	7	$ 7,257,500	$ 1,036,786	21%
Land	Wailea Pualani	6	$ 3,085,000	$ 514,167	4	$ 3,030,000	$ 757,500	47%
Land	Makena	7	$ 23,950,000	$ 3,421,429	4	$ 18,200,000	$ 4,550,000	33%
Land	Maluhia	2	$ 9,500,000	$ 4,750,000				
	Subtotal	48	$ 62,847,990	$ 1,309,333	28	$ 52,255,500	$ 1,866,268	43%
Residence	Palau'ea				1	$ 8,000,000	$ 8,000,000	
Residence	Wailea Highlands				2	$ 13,500,000	$ 6,750,000	
Residence	Wailea	1	$ 9,900,000	$ 9,900,000				
Residence	Maui Meadows	41	$ 40,098,900	$ 978,022	34	$ 40,595,000	$ 1,193,971	22%
Residence	Kaimanu Estates				2	$ 6,300,000	$ 3,150,000	
Residence	Wailea Fairways	3	$ 2,726,000	$ 908,667	3	$ 4,964,500	$ 1,654,833	82%
Residence	Wailea Kai	10	$ 10,680,000	$ 1,068,000	8	$ 10,067,500	$ 1,258,438	18%
Residence	Wailea Golf Estates	5	$ 10,725,000	$ 2,145,000	7	$ 16,813,500	$ 2,401,929	12%
Residence	Wailea Kialoa	7	$ 12,904,200	$ 1,843,457	7	$ 16,175,000	$ 2,310,714	25%
Residence	Wailea Golf Vistas	3	$ 4,700,000	$ 1,566,667	2	$ 5,807,500	$ 2,903,750	85%
Residence	Wailea Pualani	6	$ 8,389,000	$ 1,398,167	7	$ 10,594,000	$ 1,513,429	8%
Residence	Makena	4	$ 8,937,700	$ 2,234,425	1	$ 3,100,000		
Residence	Makena Place	2	$ 12,800,000	$ 6,400,000	1	$ 7,500,000	$ 7,500,000	17%
Residence	Maluhia				3	$ 30,150,000	$ 10,050,000	
	Subtotal	82	$ 121,860,800	$ 1,486,107	78	$ 173,567,000	$ 2,225,218	50%
Total		**274**	**$ 331,935,204**	**$ 1,211,442**	**237**	**$ 374,687,075**	**$ 1,580,958**	**31%**

Table 4

Summary of Maui Resort Real Estate Sales by Active Project and Resales, 2004 and 2005

		2004 sales			2005 sales			
Land Use	Subdivision	#	$	Average Price	#	$	Average Price	% change
Kaanapali								
Villa	Maui Kai	8	$ 2,853,000	$ 356,625	4	$ 1,991,330	$ 497,833	40%
Villa	Papakea				4	$ 2,227,000	$ 556,750	
Villa	Kaanapali Shores	56	$ 26,484,958	$ 472,946	40	$ 22,763,950	$ 569,099	20%
Villa	Mahana	27	$ 16,974,826	$ 628,697	10	$ 9,258,000	$ 925,800	47%
Villa	Hale Kaanapali	10	$ 3,395,000	$ 339,500	17	$ 8,100,600	$ 476,506	40%
Villa	Kaanapali Plantation	7	$ 3,264,000	$ 466,286	3	$ 2,247,000	$ 749,000	61%
Villa	Masters @ Kaanapali Hillside	29	$ 21,674,300	$ 747,390	24	$ 24,954,100	$ 1,039,754	39%
Villa	Vintage	11	$ 10,860,750	$ 987,341	10	$ 11,295,000	$ 1,129,500	14%
Villa	International Colony Club	7	$ 3,071,000	$ 438,714	8	$ 4,880,400	$ 610,050	39%
Villa	Maui Eldorado	14	$ 4,320,600	$ 308,614	17	$ 8,678,159	$ 510,480	65%
Villa	Kaanapali Alii	11	$ 16,080,000	$ 1,461,818	9	$ 13,755,000	$ 1,528,333	5%
Villa	Kaanapali Royal	11	$ 6,874,000	$ 624,909	9	$ 6,716,000	$ 746,222	19%
Villa	Whaler	27	$ 20,764,500	$ 769,056	20	$ 20,057,915	$ 1,002,896	30%
Villa	Summit	3	$ 4,097,500	$ 1,365,833	3	$ 5,095,000	$ 1,698,333	24%
	Subtotal	221	$ 140,714,434	$ 636,717	178	$ 142,019,454	$ 797,862	25%
Land	Royal Kaanapali Estates	1	$555,000	$ 555,000	0	$ -		
Land	Ke Alii S/D I Ph IIA	3	$1,680,000	$ 560,000	3	$ 3,530,000	$ 1,176,667	110%
Land	Pinnacle at Kaanapali	16	$10,745,000	$ 671,563	2	$ 2,190,000	$ 1,095,000	63%
Land	Kaanapali Hillside	2	$1,100,000	$ 550,000	3	$ 1,920,000	$ 640,000	16%
Land	Kaanapali Golf Estates	2	$1,275,000	$ 637,500	2	$ 1,435,000	$ 717,500	13%
Land	Ke Alii S/D I	2	$1,375,000	$ 687,500	6	$ 5,857,000		
	Subtotal	26	$ 16,730,000	$ 643,462	16	$ 14,932,000	$ 933,250	45%
Residence	Ke Alii S/D III				1	$ 3,523,328	$ 3,523,328	
Residence	Kaanapali Vista	1	$ 825,000	$ 825,000	3	$ 3,592,000	$ 1,197,333	45%
Residence	Kaanapali Hillside	16	$ 17,862,500	$ 1,116,406	13	$ 21,893,000	$ 1,684,077	51%
Residence	Kaanapali Golf Estates	7	$ 10,297,000	$ 1,471,000	5	$ 10,550,000	$ 2,110,000	43%
Residence	Ke Alii S/D I	3	$ 4,051,491	$ 1,350,497	4	$ 8,930,000	$ 2,232,500	65%
Residence	Royal Kaanapali Estates				1	$ 2,300,000	$ 2,300,000	
	Subtotal	27	$ 33,035,991	$ 1,223,555	27	$ 50,788,328	$ 1,881,049	54%
Total		**274**	**$ 190,480,425**	**$ 695,184**	**221**	**$ 207,739,782**	**$ 939,999**	**35%**

ranch, it is certainly worth checking as a source of potential buyers who have already expressed their appreciation for the island and the desire to return on a regular basis.

TOTAL MARKET POTENTIAL FOR LA'AU POINT LOTS AND RESIDENCES

	Number of Lots and Residences
From Molokai Transfer Market	58
From Interisland Transfer Market	98
Ongoing Market	192
Total	348

As discussed, the transfer market on its own is sufficient to provide initial support for the La'au Point Lots and Residences project and that is a strong comfort level for moving forward. The ongoing market is also quite strong but it is typically more difficult to reach and it requires more education and longer to develop. However, the location of La'au Point at an increasingly difficult to find beachfront location in Hawaii provides strong differentiation for the project site to both mainland and foreign visitors.

Table 7
Molokai Real Estate Pricing History

	2006 (2 months)		2005		2004		2003		2002		2001		2000		% Change (00 to 05)	
	Average Price	Price/ SF	Average Price	Price/ SF	Average Price	Price/ SF	Average Price	Price/ SF	Average Price	Price/ SF	Average Price	Price/ SF	Average Price	Price/ SF	Average Price	Price/ SF
Condos																
Paniolo Hale	$ 460,000	$ 697	$ 400,000	$ 403	$ 302,778	$ 261	$ 168,333	$ 203	$ 249,925	$ 235	$ 146,667	$ 132	$ 204,563	$ 173		
Ke Nani Kai	$ 305,033	$ 389	$ 300,539	$ 349	$ 195,006	$ 227	$ 139,558	$ 175	$ 121,438	$ 135	$ 106,417	$ 126	$ 141,500	$ 147		
West Molokai Resort	$ 305,000	$ 807	$ 243,350	$ 585	$ 168,323	$ 432	$ 100,810	$ 267	$ 95,875	$ 220	$ 88,600	$ 208	$ 62,727	$ 145		
Subtotal Kaluakoi	$ 351,520	$ 498	$ 291,992	$ 397	$ 203,153	$ 292	$ 123,531	$ 212	$ 147,184	$ 189	$ 108,679	$ 144	$ 104,273	$ 157	180%	153%
Molokai Shores	$ 220,750	$ 393	$ 253,600	$ 415	$ 111,000	$ 198	$ 108,000	$ 192	$ 116,500	$ 175	$ 97,475	$ 159	$ 87,000	$ 155		
Hotel Molokai			$ 108,500	$ 337	$ 74,833	$ 144					$ 38,000	$ 93				
Molokai Beach Cottages	$ 180,000	$ 222	$ 180,000	$ 222									$ 83,000	$ 102		
Kilohana Kai Subdivision			$ 195,000	$ 226	$ 123,000	$ 142	$ 140,000	$ 142	$ 140,000	$ 162	$ 135,500	$ 144	$ 140,000	$ 162		
Wavecrest I	$ 310,500	$ 514	$ 256,500	$ 418	$ 176,238	$ 292	$ 95,126	$ 152	$ 89,042	$ 135	$ 75,667	$ 125	$ 95,750	$ 125		
Total	$ 316,394	$ 471	$ 260,678	$ 379	$ 176,226	$ 267	$ 114,885	$ 189	$ 126,474	$ 172	$ 104,554	$ 143	$ 101,864	$ 152	156%	149%
Lots																
Kaluakoi	$ 536,333	$0.66	$ 503,460	$ 1.12	$ 293,645	$ 0.68	$ 315,935	$ 0.83	$ 315,000	$ 1.21	$ 312,500	$0.93	$ 255,364	$ 0.55	97%	103%
Other	$ 214,438	$7.81	$ 182,358	$ 2.04	$ 118,381	$ 1.33	$ 126,441	$ 1.38	$ 118,086	$ 1.46	$ 127,364	$2.11	$ 100,556	$ 1.70	81%	20%
Total	$ 352,393	$0.97	$ 258,090	$ 1.48	$ 172,117	$ 0.89	$ 195,922	$ 0.99	$ 135,209	$ 1.40	$ 215,524	$1.13	$ 185,700	$ 0.66	39%	124%
Residences																
Kaluakoi			$ 1,528,075	$ 587	$ 937,600	$ 635	$ 1,161,700	$ 433			$ 598,625	$ 190	$ 400,000	$ 130	282%	350%
Others	$ 303,143	$ 213	$ 371,251	$ 264	$ 300,031	$ 201	$ 216,393	$ 167	$ 165,140	$ 109	$ 128,607	$ 102	$ 189,281	$ 147	96%	80%
Total	$ 303,143	$ 213	$ 491,441	$ 322	$ 338,907	$ 227	$ 296,504	$ 210	$ 165,140	$ 109	$ 166,976	$ 118	$ 207,343	$ 144	137%	124%

Table 4
Summary of Maui Resort Real Estate Sales by Active Project and Resales, 2004 and 2005

		2004 sales			2005 sales			
Land Use	Subdivision	#	$	Average Price	#	$	Average Price	% change
Kapalua								
Villa	Bay Villas	20	$ 17,458,000	$ 872,900	16	$ 19,681,417	$ 1,230,089	41%
Villa	Golf Villas	20	$ 12,263,000	$ 613,150	6	$ 4,864,000	$ 810,667	32%
Villa	Ironwoods	6	$ 16,152,500	$ 2,692,083	2	$ 5,125,000	$ 2,562,500	-5%
Villa	Ridge	15	$ 11,560,000	$ 770,667	19	$ 17,340,800	$ 912,674	18%
Villa	Coconut Grove	4	$ 12,967,500	$ 3,241,875	3	$ 9,561,300	$ 3,187,100	-2%
	Subtotal	65	$ 70,401,000	$ 1,083,092	46	$ 56,572,517	$ 1,229,837	14%
Land	Pineapple Hill	2	$ 1,724,800	$ 862,400	4	$ 7,030,000	$ 1,757,500	104%
Land	Kapalua	1	$ 4,794,180	$ 4,794,180	0	$ -		
Land	Plantation Estates	7	$ 11,820,000	$ 1,688,571	3	$ 7,600,000	$ 2,533,333	50%
Land	Pineapple Hill at Kapalua PH 2	3	$ 3,560,000	$ 1,186,667	1	$ 1,300,000	$ 1,300,000	10%
Land	Honolua Ridge				3	$ 5,150,000	$ 1,716,667	
	Subtotal	13	$ 21,898,980	$ 1,684,537	11	$ 21,080,000	$ 1,916,364	14%
Residence	Pineapple Hill	7	$ 16,765,000	$ 2,395,000	8	$ 22,195,000	$ 2,774,375	16%
Residence	Kapalua Place	1	$ 4,470,000	$ 4,470,000	1	$ 8,000,000	$ 8,000,000	79%
Residence	Pineapple Hill at Kapalua PH 2	3	$ 9,280,000	$ 3,093,333	1	$ 4,900,000		
Residence	Plantation Estates				2	$ 15,920,000	$ 7,960,000	
	Subtotal	11	$ 30,515,000	$ 2,774,091	12	$ 51,015,000	$ 4,251,250	53%
Total		**89**	**$ 122,814,980**	$ 1,379,944	**69**	**$ 128,667,517**	**$ 1,864,747**	**35%**
Total		**637**	**$ 645,230,609**	**$ 1,012,921**	**527**	**$ 711,094,374**	**$ 1,349,325**	**33%**
Monthly Average		53	$ 53,769,217		44	$ 59,257,865		

Source: Knowledge Based Consulting Group

Table 5
Comparison of West Maui Resort Community Real Estate Sales, 2005 to 2004

	2005				2004				Price Changes		Average Size (SF)		
Resort	Number of Sales	Total Sales	Average Sales Price	$/SF	Number of Sales	Total Sales	Average Sales Price	$/SF	Average Price	$/ SF	2005	2004	% Change
Condos													
Wailea	131	$148,864,575	$1,136,371	$945	144	147,226,414	$ 1,022,406	$ 820	11%	15%	1,202	1,247	-3.6%
Kaanapali	178	$142,019,454	$797,862	$756	221	140,714,434	$ 636,717	$ 610	25%	24%	1,055	1,043	1.1%
Kapalua	46	$56,572,517	$1,229,837	$959	65	70,401,000	$ 1,083,092	$ 784	14%	22%	1,283	1,382	-7.2%
Total	355	$347,456,546	$978,751	$ 859	430	$358,341,848	$ 833,353	$ 717	17%	20%	1,139	1,162	-2.0%
Lots													
Wailea	28	$ 52,255,500	$1,866,268	$61	48	62,847,990	$ 1,309,333	$ 46	43%	34%	30,379	28,612	6.2%
Kaanapali	16	$ 14,932,000	$933,250	$61	26	16,730,000	$ 643,462	$ 38	45%	61%	15,385	17,124	-10.2%
Kapalua	11	$ 21,080,000	$1,916,364	$14	13	21,898,980	$ 1,684,537	$ 23	14%	-37%	133,634	74,366	79.7%
Total	55	$88,267,500	$1,604,864	$34	87	$101,476,970	$ 1,166,402	$ 36	38%	-6%	46,668	32,016	45.8%
Residences													
Wailea	78	$173,567,000	$2,225,218	$ 741	82	121,860,800	$ 1,486,107	$ 526	50%	41%	3,001	2,827	6.2%
Kaanapali	27	$ 50,788,328	$1,881,049	$ 589	27	33,035,991	$ 1,223,555	$ 399	54%	48%	3,194	3,066	4.2%
Kapalua	12	$ 51,015,000	$4,251,250	$ 837	11	30,515,000	$ 2,774,091	$ 712	53%	18%	5,080	3,896	30.4%
Total	117	$275,370,328	$2,353,593	$ 722	120	$185,411,791	$ 1,545,098	$ 519	52%	39%	3,259	2,979	9.4%
All Real Estate													
Wailea	237	$374,687,075	$1,580,958		274	$331,935,204	$ 1,211,442		31%				
Kaanapali	221	$207,739,782	$939,999		274	$190,480,425	$ 695,184		35%				
Kapalua	69	$128,667,517	$1,864,747		89	$122,814,980	$ 1,379,944		35%				
	527	$711,094,374	$1,349,325		637	$645,230,609	$ 1,012,921		33%				

Source: KBCG

Table 6
Molokai Sales History

	2006 (2 months)		2005		2004		2003		2002		2001		2000		% Change (00 to 05)	
	Sales	Sales Volume	Sales	Sales Volume	Sales	Sales Volume	Sales	Sales Volume	Sales	Sales Volume	Sales	Sales Volume	Sales	Sales Volume	Sales	Sales Volume
Condos																
Paniolo Hale	3	$ 1,380,000	3	$ 1,200,000	9	$ 2,725,000	6	$ 1,010,000	6	$ 1,499,551	3	$ 440,000	8	$ 1,636,500		
Ke Nani Kai	6	$ 1,830,200	19	$ 5,710,250	16	$ 3,120,100	13	$ 1,814,250	8	$ 971,500	6	$ 638,500	3	$ 424,500		
West Molokai Resort	1	$ 305,000	10	$ 2,433,500	22	$ 3,703,110	21	$ 2,117,000	8	$ 767,000	5	$ 443,000	22	$ 1,380,000		
Kaluakoi Subtotal	10	$ 3,515,200	32	$ 9,343,750	47	$ 9,548,210	40	$ 4,941,250	22	$ 3,238,051	14	$ 1,521,500	33	$ 3,441,000	-3%	172%
Molokai Shores	2	$ 441,500	5	$ 1,268,000	6	$ 666,000	3	$ 324,000	2	$ 233,000	4	$ 389,900	5	$ 435,000		
Hotel Molokai			2	$ 217,000	6	$ 449,000					1	$ 38,000				
Molokai Beach Cottages	1	$ 180,000	3	$ 540,000									1	$ 83,000		
Kilohana Kai Subdivision			5	$ 975,000	5	$ 615,000	2	$ 280,000	1	$ 140,000	4	$ 542,000	1	$ 140,000		
Wavecrest I	4	$ 1,242,000	22	$ 5,643,000	24	$ 4,229,705	19	$ 1,807,400	12	$ 1,068,500	3	$ 227,000	4	$ 383,000		
Total	17	$ 5,378,700	69	$ 17,986,750	88	$15,507,915	64	$ 7,352,650	37	$ 4,679,551	26	$ 2,718,400	44	$ 4,482,000	57%	301%
Lots																
Kaluakoi	6	$ 3,218,000	25	$ 12,586,500	65	$19,086,919	33	$ 10,425,870	2	$ 630,000	10	$ 3,125,000	11	$ 2,809,000	127%	348%
Other	8	$ 1,715,500	81	$ 14,771,014	147	$17,401,939	57	$ 7,207,120	21	$ 2,479,800	11	$ 1,401,000	9	$ 905,000	800%	1532%
Total	14	$ 4,933,500	106	$ 27,357,514	212	$36,488,858	90	$ 17,632,990	23	$ 3,109,800	21	$ 4,526,000	20	$ 3,714,000	430%	637%
Residences																
Kaluakoi	0	$ -	8	$ 12,224,600	5	$ 4,688,000	5	$ 5,808,500	0	$ -	4	$ 2,394,500	3	$ 1,200,000	167%	919%
Others	7	$ 2,122,000	69	$ 25,616,340	77	$23,102,373	54	$ 11,685,230	46	$ 7,596,450	45	$ 5,787,300	32	$ 6,057,000	116%	323%
Total	7	$ 2,122,000	77	$ 37,840,940	82	$27,790,373	59	$ 17,493,730	46	$ 7,596,450	49	$ 8,181,800	35	$ 7,257,000	120%	421%
Total	38	$ 12,434,200	252	$ 83,185,204	382	$79,787,146	213	$ 42,479,370	106	$ 15,385,801	96	$15,426,200	99	$ 15,453,000	155%	438%

Table 8

Origin of Property Owners at Kaluakoi, Molokai

Zip Code Range			States	Localities	Lot or Residence		Condominium		Total	
0	10000		MA to NJ		7	3.1%	8	2.7%	15	2.9%
10000	20000		NY to DE		3	1.3%	4	1.3%	7	1.3%
20000	30000		DC to SC		6	2.7%	3	1.0%	9	1.7%
30000	40000		GA to MS		5	2.2%	3	1.0%	8	1.5%
40000	50000		KY to MI		5	2.2%	9	3.0%	14	2.7%
50000	60000		IA to MN		0	0.0%	7	2.3%	7	1.3%
60000	70000		IL to Ne		2	0.9%	7	2.3%	9	1.7%
70000	80000		LA to TX		2	0.9%	3	1.0%	5	1.0%
80000	90000		CO to NV		15	6.7%	29	9.7%	44	8.4%
	90000	91000	CA	Los Angeles, Long Beach	13	5.8%	9	3.0%	22	4.2%
	91000	92000	CA	Pasadena, Glendale, Ontario	7	3.1%	10	3.3%	17	3.2%
	92000	93000	CA	San Diego, Orange County	24	10.7%	24	8.0%	48	9.2%
	93000	94000	CA	Ventura, Fresno, Monterey	10	4.4%	16	5.4%	26	5.0%
	94000	95000	CA	San Francisco, Palo Alto, Marin	23	10.2%	23	7.7%	46	8.8%
	95000	96000	CA	San Jose, Santa Cruz, Sacramento	9	4.0%	26	8.7%	35	6.7%
	96000	96200	CA	Redding, Eureka, Lake Tahoe	0	0.0%	1	0.3%	1	0.2%
	96700	96900	HI							
		Molokai			31	13.8%	21	7.0%	52	9.9%
		Maui			15	6.7%	2	0.7%	17	3.2%
		Oahu			15	6.7%	24	8.0%	39	7.4%
		Kauai			4	1.8%	1	0.3%	5	1.0%
		Hawaii			1	0.4%	1	0.3%	2	0.4%
	97000	98000	OR		9	4.0%	15	5.0%	24	4.6%
	98000	99500	WA		9	4.0%	28	9.4%	37	7.1%
	99500	99999	AK		9	4.0%	8	2.7%	17	3.2%
90000	99999				0	0.0%		0.0%	0	0.0%
		Canada			1	0.4%	15	5.0%	16	3.1%
		Japan			0	0.0%	1	0.3%	1	0.2%
		Other Foreign			0	0.0%	1	0.3%	1	0.2%
Total					225	100.0%	299	100.0%	524	100.0%
	California Total				86	38.2%	109	36.5%	195	37.2%
	Hawaii Total				66	29.3%	49	16.4%	115	21.9%

SECTION III

MARKET SUPPORTABLE REAL ESTATE PRODUCTS AT LA'AU POINT

The market research for La'au Point Lots and Residences indicates that there is a sufficient market that has the income, net worth, and product interest to qualify for a lot at La'au Point. The challenge for Molokai Properties Limited is to create a real estate product that appeals to this market and an operations and amenity program that delivers buyer satisfaction. A highly targeted database marketing and image program will also be critical components for project success. KBCG's market research recommends that the development program should follow some basic product criteria and strategies. These criteria include:

DEVELOPMENT FEATURES

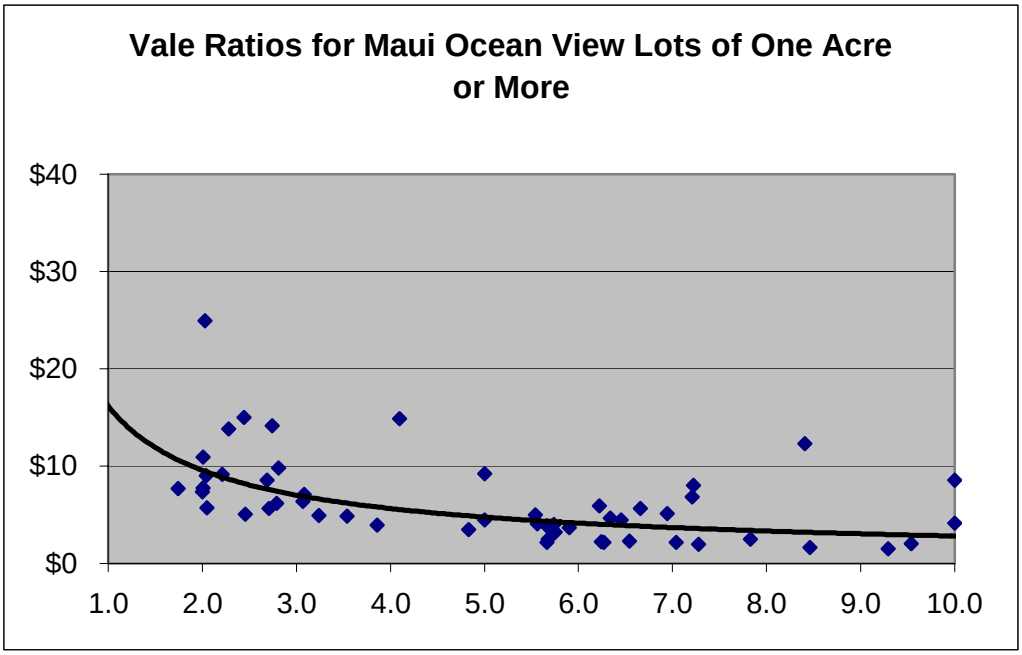
- Oceanfront Premiums. The scarcity and premiums for ocean front, and particularly beach front, property are substantial and these opportunities are reflected in the site plan.
- Privacy. There should be concern for owner privacy and exclusivity reflected throughout the project. This is particularly important with respect to sight lines from and toward the building envelopes/ residences.
- Residential Activity. Since La'au Point will not have any built product, it will be important to demonstrate some momentum for community development through incentives for early home building to spec builders and others. It would also be advisable to have an assistance program to guide/ manage the approval and construction process for individual lot buyers who are trying to build a home.
- Protected ocean views from second row and inland units. This commitment must be easily communicated to the market.
- Attractive landscaping. Special landscaping treatments using native plants should differentiate La'au Point from Kaluakoi, particularly at the entrance to La'au Point residential areas and at focal points of owner activity.
- Project character. The project should make a special effort to appreciate and incorporate Hawaiian culture, graciousness and service. This is an inherent strength of the people of the island of Molokai and one in which they should be extremely proud. This pride and graciousness should continue to be expressed in the nature and quality of improvements, sensitivity to the land, and other appropriate ways

Pricing Considerations

Prices for oceanfront and unobstructed ocean view lots, condominiums, and residences are at a premium throughout the Hawaiian Islands. As seen in the following price comparison for lots of between 1 acre and 10 acres, the price per square foot begins to accelerate as lot sizes reach two acres or less.

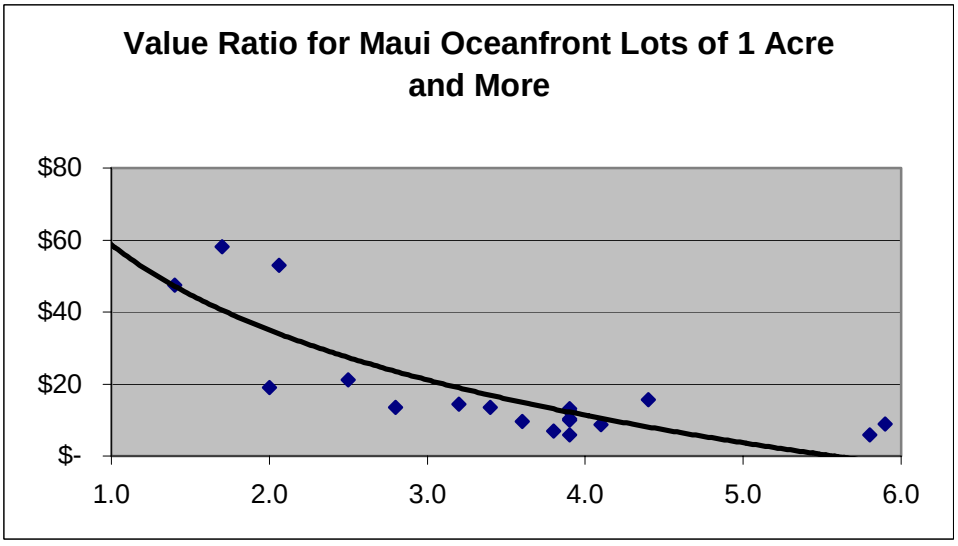
Ocean View Lots

Two acre lots with good ocean views have value ratios between $5 per square foot and $25 per square foot depending upon location. The average is $10 per square foot



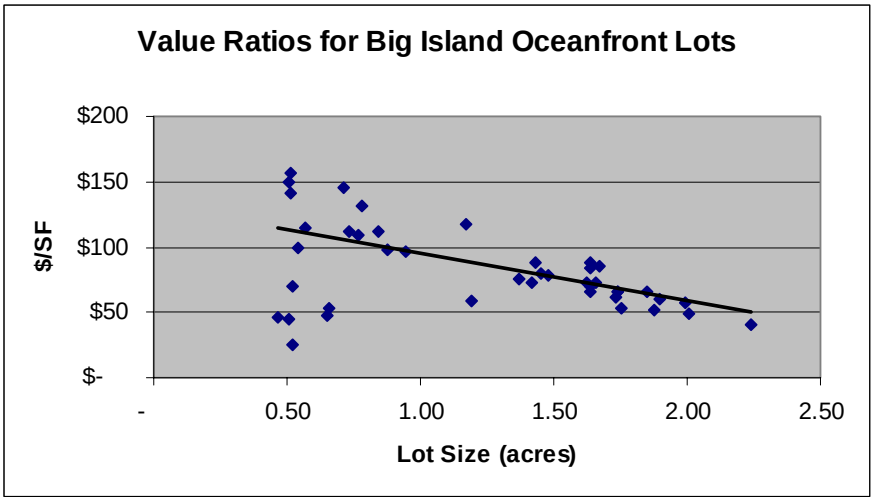
Ocean Front Lots

The value ratio for Ocean Front lots also begins to increase at the two acre size mark (indicating that there is relatively little value in a larger lot sales product for this market). The average value ratio for a two acre ocean front lot is around $37 per square foot. Hence the proposed 2-acre lot program for La'au Point is both cost efficient and market efficient when compared to a larger lot program.



Big Island Comparison

The Big Island has a more active oceanfront lot market and the below chart shows a relatively linear relationship between lot size and value ratio. On the Big Island, 2 acre ocean front lots in the master planned resorts achieve prices in the $4 million range.



Beachfront lots such as those recently sold at Black Sand Beach and Pauoa Beach at Mauna Lani and at Kukio range from $6 million to about $20 million.

Local Conditions

The sales prices and absorption rates for oceanfront and ocean view property at La'au Point will also be influenced by the sales experience and inventory available at Kaluakoi. The recent sales history for lots and residences at Kaluakoi is presented in Appendix D. Currently, ocean view lots are selling at prices of around $400,000 to $500,000 for 5 acres and $600,000 to $700,000 for 20 acres, with view quality being the principal variable. As discussed in Section II, prices have accelerated rapidly in recent years.

There have been relatively few ocean front property sales at Kaluakoi, so we analyzed both raw land sales and residence sales to estimate residual land value. For the 5 acre oceanfront parcels, lot prices are in the $1.25 million range, while the residual value approach yields land values of $800,000 to $2.1 million (3 sales).

Competitive Environment

In terms of future competition, there are a number of projects on the Big Island that are targeted at the luxury market, and there may be some oversupply of ocean view properties in the near term. On the other hand there is very little upcoming inventory of first row beachfront or beach access property. Kukio is just starting sales of its Lot 4 program north of Kona Village, with initial sales at occurring at around $6.5 million. The Kohanaiki project just south of the airport will have some 40 front row lots, but they are set well back from the ocean. Nevertheless, the developer plans to put these on the market in the $4 to $6 million range. On Maui, there are a few new lot developments selling at Kapalua, Kaanapali, and Wailea but they are generally golf and ocean view products mauka of the highway. The only ocean front products currently available are high density condominium and fractional ownership products that are not really competitive with La'au Point. The Royal Lahaina is currently going through the approval

process for a more low density condominium product in association with its renovation program. Whereas these will be very attractive units, there will be relatively few and at substantial prices.

Market Pricing and Absorption for La'au Point

Considering the strength of underlying demand for oceanfront and quality ocean view property on Hawaii, lot prices should remain at a premium due to limited supply. Whereas Molokai has traditionally lagged the other islands in terms of real estate development and tourism activity, it is becoming better known and recognized as a low density and uncrowded alternative to the resort islands. It is also not trying to capture the ultra premium market that is targeted by the Kohala Coast of the Big Island, the West Maui resorts, and Lanai. Under these conditions, we expect that there will be a significant tradeoff between pricing and absorption rates at La'au Point. An accelerated absorption rate can be achieved through holding prices at a benchmark substantially below the other islands. The greatest value can be achieved by spreading out the development period to capture the premiums associated with the increasing scarcity of oceanfront and prime oceanview real estate in Hawaii. The basic price structure for the La'au Point lot program is shown below. The west facing properties have higher base prices due to their sunset views and proximity to the resort amenities of Kaluakoi.

Market Driven Pricing Structure for La'au Point Home Sites

Unit Type	Number	Premium	Unit Price	Lot Size	$/SF	Sales Value
West/ Sunset Facing						
A Oceanfront	40	250%	$ 1,750,000	87,120	$ 20.09	$ 70,000,000
C Premium Ocean View	28	25%	$ 500,000	87,120	$ 5.74	$ 14,000,000
South Facing						
B Oceanfront	58	225%	$ 1,495,000	87,120	$ 17.16	$ 86,710,000
D Premium Ocean View	74	15%	$ 460,000	87,120	$ 5.28	$ 34,040,000
Total	200		$ 1,023,750	17,424,000	$ 11.75	$ 204,750,000

With this pricing program the project could achieve an absorption rate of around 40 units per year, yielding a total sales value of $205 million, before appreciation and inflation.

Appendix O

Hallstrom Letter

THE HALLSTROM GROUP INC.
REAL ESTATE
CONSULTANTS
& APPRAISERS

IMPACT OF LA'AU POINT DEVELOPMENT
ON REAL PROPERTY TAXES

We have been asked to comment on the potential increases to real property tax on existing property in the areas of Maunaloa, Kualapu'u, Kaunakakai and beyond on Molokai as a result of the development of La'au Point, a 200 one-acre high-end lot development on the extreme southwest end of the island. Specifically, "Will the sale of the proposed estate lots cause real property taxes to increase in these areas?"

The question is a valid one. The simple answer is that the assessments of existing property that is not adjacent (and thus not competing in the same market or market area), and/or that has different highest and best use potentials, will not be directly affected.

This finding is based on our analyses of paired assessment trends over time between expanding developments and non-adjacent land holdings, an understanding of value trends and influences, and discussion with the Maui County and Oahu tax offices concerning this specific matter. Of particular note has been the historic lack of 'cause and effect' between changes in market prices in Kaluakoi and assessed values elsewhere on the island.

Although not the case with La'au Point, significant market activity on property that has similar use potentials on adjacent lands may cause a change in market value and hence assessment -- but, this is for similar kinds of property, such as lots in the same subdivision or agricultural parcels that have near identical characteristics, where potential purchasers would consider them as alternatives.

The fact is the La'au Point lots are physically separated from the rest of Molokai by hundreds of acres of ranch land, and will be a unique market unto itself. Secondary impacts, if any, might only be potentially possible among the makai portions of the Kaluakoi Ranch lots; however even this inventory already has an established dataset of its own comparable market activity. The creation of the proposed 26,400 acre Land Trust, and another 24,000 acres in either protective or agricultural easements, isolates and distinguishes La'au Point from the rest of urban Molokai.

Changes in assessments are the result of *comparable* market transactions, fueled by new economic activity or a scarce amenity. La'au Point is not a comparable to the existing real estate.

Only to the extent there is new worker in-migration to the island to support or sustain the development and its residents, could there be some modest indirect impact on selected real estate activity and prices. Offsetting, is the moratorium on further Molokai Ranch Land development as a result of the Land Trust, and protective and agricultural easements, which will reinforce the status quo and limit further development.

James E. Hallstrom, Jr., MAI, CRE
Dated: November 14, 2006

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Appendix P

Social Impact Assessment

Lāʻau Point

Social Impact Assessment

Prepared for Molokai Properties, Ltd.
By Earthplan
August 2006

Contents

Tables and Figures

1. Background and Introduction

Molokai Properties Ltd., also known as Molokai Ranch, has prepared the Community Based Master Land Use Plan, herein referred to as the Plan, for its land holdings in Moloka'i, Hawaii. The Plan area encompasses over 60,000 acres. Prepared in conjunction with the Moloka'i community, the plan includes various actions, including transferal of land to a new Land Trust and renovation of an existing hotel.

To implement a portion of the Plan, amendments to the State Land Use Map are required for proposed actions at Lā'au Point, herein referred to as the Project. An Environmental Impact Statement, or EIS, is being prepared for uses requiring these amendments. This report is summarized in and appended to the EIS that accompanies the State Land Use Boundary petition.

The proposed Project is an integral part of a Community-Based Master Plan, which is described in this report. The relationship between the Project and the Plan is symbiotic in that realization of the Plan requires Project implementation. Further, the Project's scope and characteristics were based on the overall Plan and its conditions.

This report therefore incorporates discussion and analysis of the Plan as appropriate to analyzing the social impacts of the Project.

1.1. Report Preparation and Description

This social impact assessment was prepared by Earthplan, whose principal Berna Cabacungan managed the project and served as primary interviewer, researcher, analyst and writer. Independent contractor Michael P. Mays assisted in interviews and research related to community issues, public services and facilities and projects with similar characteristics. Nalani Dahl of Community Planning and Engineering assisted with interviews and research related to census information and major forces independent of the proposed action.

The remaining portions of Section 1 present the role and purpose of social impact assessments and describe the Plan and proposed changes that require amendments to the State Land Use Map.

Section 2 establishes social context with a historic overview, population and housing trends, and demographic information. Section 3 extends the baseline information by examining the major forces for change that would influence Moloka'i with or without the Plan or proposed changes.

Section 4 presents preliminary community issues based on interviews held in the course of this study. Section 5 identifies potential social impacts in terms of population impacts, relationship to public and community plans, impacts on the social environment, and impacts on public services and facilities.

1.2. The Role and Purpose of Social Impact Assessments

Social impact assessment is a study of how a proposed action or plan affects the human environment. While there are many facets to the human environment, the social context is basically framed by relationships. The social aspects of an area relate to people living and interacting with other people. Social impact analysis explores changes in the physical environment of a community or neighborhood caused by a proposed land development may affect the neighborhood as a social environment. [1]

Social impact assessment, hereafter referred to as SIA, became a recognized subfield of research and policy application, with the passage of the U.S. National Environmental Policy Act (NEPA) legislation in 1969. [2] It is an interdisciplinary, inter-professional field of social science knowledge and application. SIA draws sometimes from social science, but other times from organizational development, political analysis, or journalism. Its primary function has to do with the development and disclosure of social information relevant to informing the decision-making process and/or designing management actions to deal with problematic social outcomes of a proposed project.

The goal of SIA is to predict the social effects of a policy, program or project while still in the planning stage, before those effects have occurred. The overall framework for SIA is anticipatory research, which seeks to place the expectation and attainment of desired outcomes on a rational and reliable basis.

Commonly identified uses of SIA include:

[1] *Kathleen Christiansen,* ***Social Impacts of Land Development: An Initial Approach to Estimating Impacts on Neighborhood Usages and Perceptions*** *(1976)*

[2] *Rabel Burdge and Frank Vanclay, "Social Impact Assessment,"* ***Environmental and Social Impact Assessment,*** *ed. Frank Vanclay and Daniel A. Bronstein (1996), 34.*

Understanding the ability of a community or group to adapt to changing conditions - In identifying social consequences of a proposed action, cause- and-effect relationships are complex. Different people and different communities react differently to similar events. An important function of SlAs is therefore to obtain and analyze the necessary information about community organization and likely responses to changing conditions. As such, the non-project social scenario is as important as the with-project scenario because it provides the analyst with a realistic social context for the proposed action.

Defining the problems or clarifying the issues involved in a proposed change Frequently, opposition to or support for a proposed project can only be understood and addressed when the proponent is aware of cultural tendencies, underlying issues, vested interests, and misperceptions. The SIA is the basis for defining and clarifying project or program issues in a systematic approach within the EIS framework.

Illuminating the meaning and importance of anticipated change - An important objective of SIA is to determine what meaning a probable impact would have for a community and its residents. Whereas a certain impact may have relatively low social significance in some communities, it may be given more import or significance in other settings or communities.

Identifying mitigation opportunities or requirements - Another function of SIA is to explore how a proposed action can cause the least adverse and most beneficial impacts, and to identify responses from the community and affected persons. SIA information can be crucial in determining what mitigation is necessary, what mitigation alternatives exist, and which mitigation strategies are most likely to work.

1.3. Description of the Plan and the Project

1.3.1. The Community-Based Master Land Use Plan

As noted earlier, social impact assessment is a study of relationships. In that the proposed Project is an integral part of a Community-Based Master Plan, an overview of the Plan is hereby presented.

Molokai Ranch owns over 60,000 acres or about 35 percent of the island of Moloka'i. Most of its property is located at the west end of the island. Molokai Ranch worked with the Moloka'i community to develop a plan that designates future uses for all of its land holdings. Highlights of the Plan are as follows:

Protection of land holdings and resources from future development

The Plan protects 55,000 acres, or 85 percent of Molokai Ranch's land holdings, from development in perpetuity through Land Trust donations and Protective Easement restrictions.

Formation of Moloka'i Land Trust

A key component in the protection from future development is the formation of the Moloka'i Land Trust. Molokai Ranch would donate 26,200 acres, or 40 percent of its land holdings, to the Land Trust. The Land Trust's ownership and management of these lands will:

- Protect historic and cultural sites;
- Preserve natural and environmental resources; and
- Protect subsistence gathering

The land donation includes two hotel-zoned sites at Kaluako'i and several culturally significant sites. Of the total land gift, 14,390 acres would be protected in perpetuity for agricultural use and 10,560 acres agriculturally zoned lands would be protected as Open Space, thereby prohibiting structural development.

Part of the land donation includes the site of existing communications facilities that operate under a rental agreement with Molokai Ranch. The income generated by these rentals, which currently total more than $250,000 per annum with a capitalized value exceeding $2.5 million, will support the Land Trust in its administrative costs.

Formation of Moloka'i Community Development Corporation

The Plan calls for the formation of the Moloka'i Community Development Corporation, hereafter referred to as CDC, to develop affordable housing, expand educational opportunities and assist Land Trust with project funding,

To help the CDC initiate its operations, Molokai Ranch would provide a 1,300 acre land base for future development of affordable housing. This land base includes:

- Conveyance of 1,100 acres above Kaunakakai, some of which could be used for affordable housing, and
- Reservation of 200 acres around Kualapu'u and Maunaloa for future development of affordable housing in partnership with Molokai Ranch.

In addition, Molokai Ranch would gift several resources to the CDC that would support community development, including:

- 5 acres in Kaunakakai zoned light industrial and available for development in 2011
- 3.2 acres adjacent to Maui Community College (MCC) that will be sold to MCC at market value
- $100,000 from a sale of five acres to Maui County for a new Kaunakakai Fire Station

Renovation of Kaluako'i Hotel and upgrade of the golf course

In discussions related to the formation of the Plan, community participants expressed a strong desire to reopen Kaluako'i Hotel and upgrade the Kaluako'i Golf Course. The Plan therefore includes this component.

1.3.2. Proposed Changes at Lā'au Point

The Lā'au Point Project site is part of a 6,348-acre identified as Tax Map Key (2)5-1-02, parcel 30. Previously used for agricultural and ranch operations, the land is currently vacant. The Project site is relatively dry, supporting mostly kiawe forest and shrub vegetative zones.

The Project site encompasses almost 1,500 acres, as shown in Table 1.

Table 1: Proposed Lā'au Point Project Land Use

Land Use	Acreage
200 Rural Residential House lots	400
Conservation and preservation	433
Rural open space	145
Parks	17
Agricultural land	301
On-site roadways and infrastructure	60
Off-site road corridor	136
Total	1,492

Of the total Project site, required amendments to the State Land Use Map are presented in Table 2.

Table 2: Acreage in State Land Use Commission Petition

Proposed Use	Acreage	Existing Designation	Proposed Designation
200 Rural Residential House lots	400	Agriculture	Rural
Rural open space	145	Agriculture	Rural
Parks	8	Agriculture	Rural
On-site roadways and infrastructure	60	Agriculture	Rural
Conservation and preservation	253	Agriculture	Conservation
County park *	9	Conservation	Rural
Total acreage in petition to the State Land Use Commission			**875 acres**

** Land will revert to Conservation District after all project improvements are completed.*

The Project features the sale of 200 rural residential lots ranging from 1.5 to two acres. The proposed access road corridor will run north to south from Pōhakuloa Road to Kaupoa Beach Camp Road, connecting with Kaluako'i Road and Kulawai Loop. An open space buffer will surround the residential lots.

The Project conservation land will include existing such designated lands and proposed lands for re-designation. It would include coastline, gulches and cultural preserves. Lot lines will be at least 50 feet mauka of current Conservation District boundary. The makai boundary for the community will be determined by current Conservation District or SMA boundary, whichever is greater.

The Moloka'i Land Trust will have ownership of all Conservation District land, including those within the Project site. It would solely own and manage the 116-acre Kamāka'ipō Gulch, and jointly own and manage the 335 acres of Conservation District land in the Project site with the Lā'au Point community homeowners association. The homeowners association will own and manage 280 acres of Agricultural District land in the Project site. This land contains common areas between lot clusters and the mauka buffer zone.

The Project is intended to reduce significant operations deficits that have been borne by Molokai Ranch since the company has acquired the property. Because of this projection of financial viability, Molokai Ranch would then be in a position to proceed with commitments to on-site resource protection and land and other donations included in the Plan.

Hence, implementation of the proposed Project would be the springboard, or starting point, in implementing the overall Plan. The Land Trust and CDC would be enabled to undertake their missions that have been outlined by the community and Molokai Ranch.

Also, proceeds generated by Project implementation would fund renovations and upgrading of Kaluako'i Hotel and Golf Course. Proceeds would fund endowment to CDC that would include five percent of the net sales of lots, plus yet-undetermined percentage of subsequent resale.

2. Profile of the Existing Community

This section establishes the social context for this project. Section 2.1 provides a historic overview. Section 2.2 describes the Study Area. In Section 2.3, population and demographic information is presented.

2.1. Historic Overview

At the time of western contact in 1778, Moloka'i's estimated population was 10,500 persons. In 1859, the Hawaiian government combined Moloka'i's Ko'olau and Kona Districts into one district due to a significant population decrease from 6,000 persons in 1832 to 2,864 persons in 1859. It was felt that such consolidation would allow for efficient administration.

Lands that eventually were part of Molokai Ranch were assigned in 1848 as part of the Great Mahele, and title to these lands was subsequently inherited by Bernice Pauahi Bishop, the last descendant of the Kamehameha dynasty. In 1859, Kamehameha IV established a sheep ranch on the west end at Kaluako'i. His brother, High Chief Kapuaiwa who became Kamehameha V, expanded this holding through acquisition of more land and addition of other types of livestock.

Princess Pauahi's inheritance excluded the land of Kaluako'i in west Moloka'i, as these were granted to her husband Charles Bishop in 1875. A group of Honolulu business owners purchased these lands and formed Molokai Ranch in 1897.

Molokai Ranch's principal enterprise was cattle raising, and their lands included 70,000 acres acquired from Bishop interests and 30,000 acres of leased land. American Sugar Company took over those lands in 1898, and leaseholds of large tracts of government land between the ranch lands.

In 1908 Moloka'i was incorporated into the newly formed Maui County. The Kalaupapa Settlement was administratively separated and became Kalawao County. It was to be managed by the State Department of Health. Moloka'i, not including Kalawao County, encompasses 53 ahupua'a. By 1910, the population had significantly declined to 1,006.

Charles Cooke purchased American Sugar Company in 1908 after unsuccessful attempts at cane sugar cultivation due to saline well water. Cooke established Molokai Ranch, and his son George Cooke managed the company.

In the early 1920s, the population increased significantly. By 1930, the number of island residents quadrupled from the 1910 count; approximately 4,400 people lived on Molokaʻi. A major influence was passage of the Hawaiian Homes Act in 1921, resulting in the settlement of Kalamaʻula, Hoʻolehua, Pālāʻau and Kapakea.

Agriculture was another major influence in population growth and settlement patterns. Pineapple was raised on Maunaloa lands leased from Molokai Ranch from 1923 to 1976 by Libby, McNeill & Libby Company, which later became Dole Pineapple. California Packing Corporation, or Del Monte, operated a pineapple plantation at Kualapuʻu. These activities attracted new residents and also a gradual population shift west from the more populated eastern areas.

In the late 1970s, resort development added to the island's economy when Molokai Ranch and Louisiana Land and Exploration Company formed a partnership to develop the Kaluakoʻi Resort. Molokai Ranch eventually sold its interest in that venture.

By the 1980s, the plantations closed, leaving the island dependent on diversified agriculture, primarily vegetable farming and cattle ranching.

In 1987, Brierly Investments, Limited, or BIL, became the sole stockholder of Molokai Ranch, whose land holdings comprised 52,000 acres. BIL reacquired 6,300 acres in southwest Molokaʻi in 2001. These lands included the abandoned Kaluakoʻi Hotel, the Kaluakoʻi Golf Course and undeveloped resort lands.

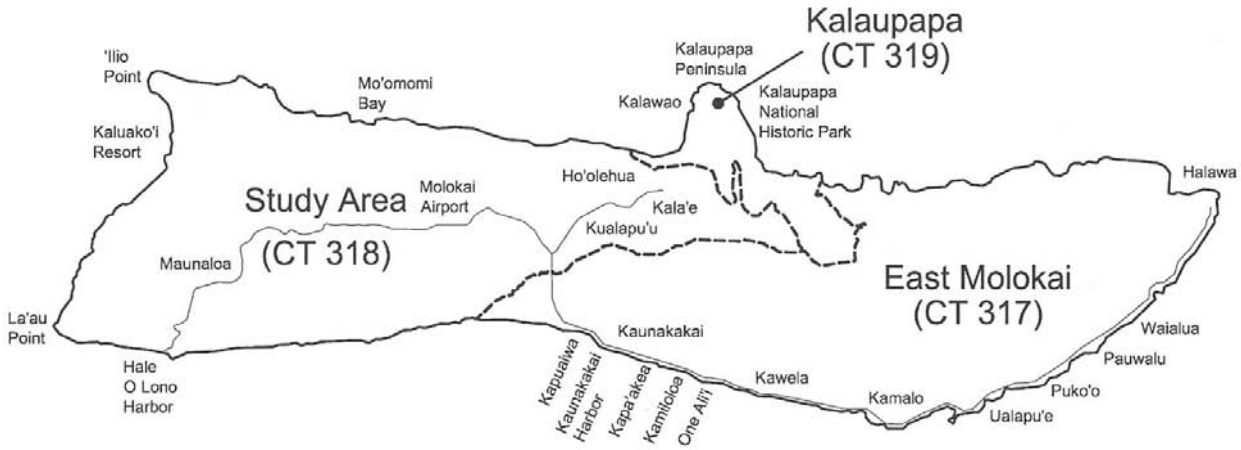
2.2. Study Area Definition

The Study Area of this social impact assessment is the West Molokaʻi region, which is coterminous with Census Tract 318. With Lāʻau Point as the starting point and heading northeast, physical landmarks in the Study Area include Kaupoa Beach, Pāpōhaku Beach, Wahīlauhue, ʻĪlio Point, Mokio Point, Kaiehu Point, Kawaʻaloa Bay, Momomi, Nēnēhānaupō, Pālāʻau State Park, Ka Ule o Nānāhoa look out, Mokomoko Gulch, Manawainui Gulch, Palaʻau Fishpond, Pākanaka fishpond, Kikauhi coast, Kolo Wharf, Halena, and Hale o Lono Harbor.

Study Area communities include Pāpōhaku Ranch, Kaluakoʻi, Maunaloa Town, Hoʻolehua, Maʻālehu, Kalaʻe, and Kualapuʻu. Kaluakoʻi Hotel and Golf Course and Molokai Ranch Lodge and Beach Villas are located in the Study Area, as well as Molokaʻi Airport. Figure A illustrates the Study Area for this analysis.

For comparative purposes, information is provided for Moloka'i Island, which includes the Census Tracts 318 and 319, the latter of which is East Moloka'i. East Moloka'i includes the town of Kaunakakai. Census Tract 319, which is Kalaupapa and part of Kalawao County, is not included this analysis. Reportedly 147 persons live in this census tract in 2000, and related population and demographic statistics from this tract are insignificant to this analysis.

Figure A: Study Area for this Report



2.3. Population and Housing Trends

2.3.1. Population Trends

Moloka'i's population increased from 5,089 persons in 1970 to 7,257 persons in 2000, which represents an overall 43 percent increase. As Table 3 indicates, the rate of growth during this 30-year period was highest in the 1970s, when the population increased an average of 1.5 percent a year.

Table 3: Moloka'i Population and Housing Trend, 1970 to 2000

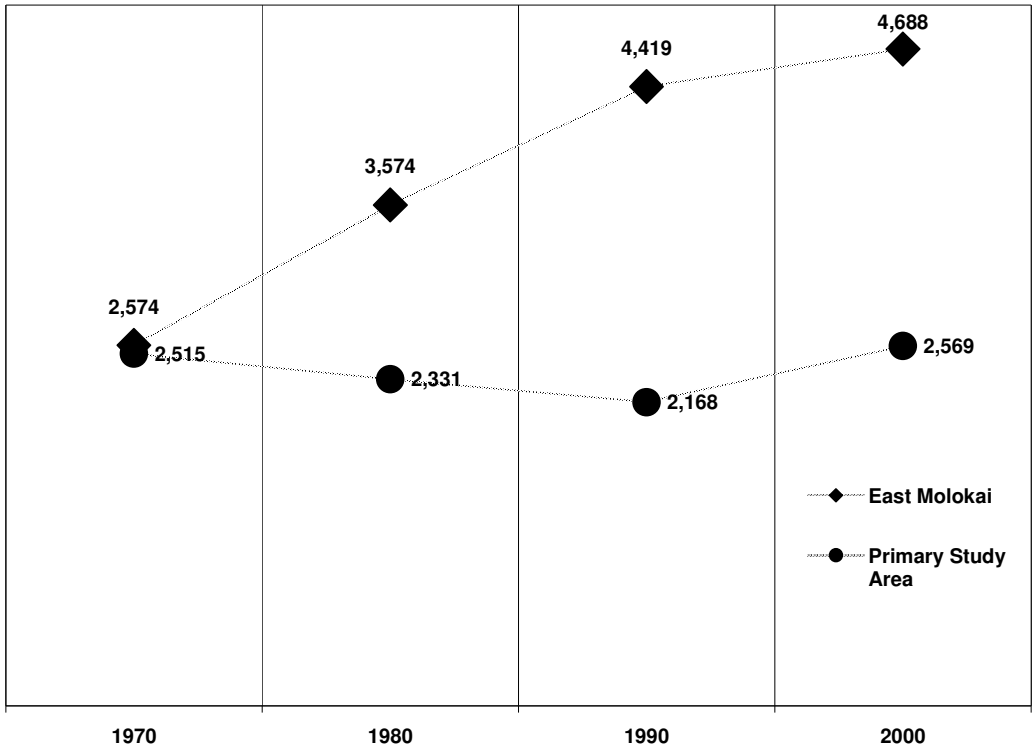
	1970	1980	*1970 - 1980 growth rate*	1990	*1980 - 1990 growth rate*	2000	*1990 - 2000 growth rate*
Population	5,089	5,905	***1.5%***	6,587	***1.1%***	7,257	***1.0%***
Housing	1,449	2,334	***4.9%***	2,731	***1.6%***	3,013	***1.0%***

Source: Census 1990, Summary Tape File 1; Census 2000 Summary Tape File 1; The State of Hawaii Data Book 2000; The State of Hawaii Data Book 1977; The State of Hawaii Data Book 1986; U.S. Bureau of the Census, Census of Housing 1980: General Housing Characteristics Hawaii; and U.S. Bureau of the CensusCensus of Population and Housing 1980: Census Tracts Hawaii, Selected Areas

As Figure B shows, most of Moloka'i's population growth occurred in East Moloka'i in this 30 year period. East Moloka'i's population increased from 2,574 in 1970 to 4,688 in 2000, which represents a significant 82 percent increase. The highest rate of growth occurred in the 1970s, when the East Moloka'i population increased an average of 3.3 percent a year.

In contrast, the Study Area population increased only two percent over 30 years. West Molokai's population decreased from 1970 to 1990 due to plantation closures. Further, the Study Area experienced only a 1.7 annual growth rate in the 1990s. In 2000, the Primary Study Area population of 2,569 persons accounted for 35 percent of Moloka'i's total resident population.

Figure B: Population Trend for Study Area and East Moloka'i, 1970 to 2000



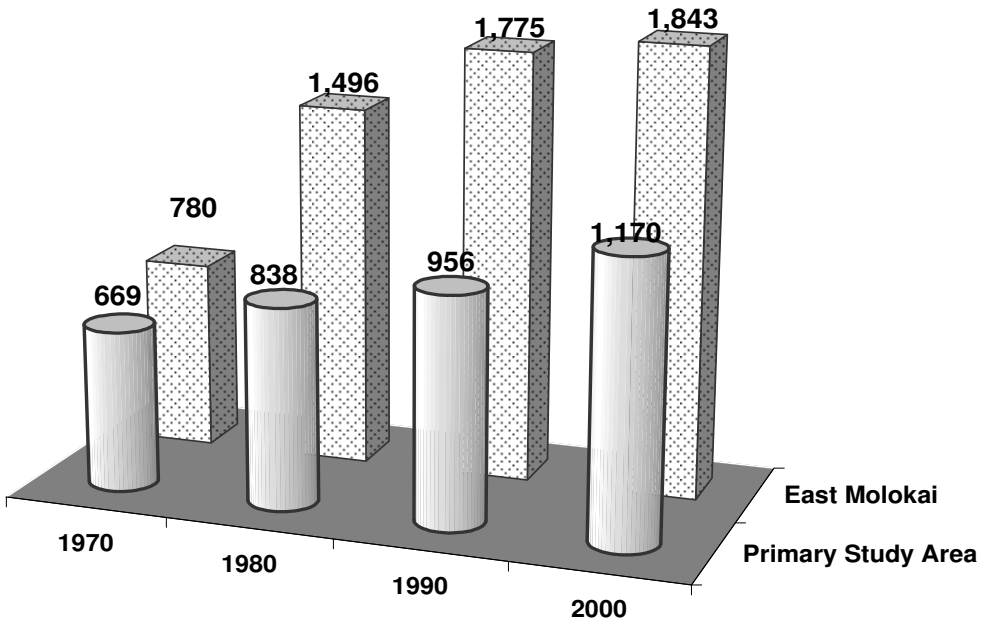
Source: Census 1990, Summary Tape File 1; Census 2000 Summary Tape File 1; The State of Hawaii Data Book 2000; The State of Hawaii Data Book 1977; The State of Hawaii Data Book 1986; U.S. Bureau of the Census, Census of Housing 1980: General Housing Characteristics Hawaii; and U.S. Bureau of the CensusCensus of Population and Housing 1980: Census Tracts Hawaii, Selected Areas

2.3.2. Housing Trends

Between 1970 and 2000, Moloka'i's supply of housing units more than doubled, from 1,449 units in 1970 to 3,013 units in 2000. Most of this increase occurred in the 1970s, when housing units increased an average of 4.5 percent a year.

Further, most of the increase in housing unit supply occurred in East Moloka'i. As Figure C shows, East Moloka'i's housing unit supply increased 136 percent from 780 units in 1970 to 1,843 units in 2000. Most of this increase occurred in the 1970s, when the housing unit supply increased an average of 6.7 percent a year.

Figure C: Housing Trend for Study Area and East Moloka'i, 1970 to 2000



Source: Census 1990, Summary Tape File 1; Census 2000 Summary Tape File 1; The State of Hawaii Data Book 2000; The State of Hawaii Data Book 1977; The State of Hawaii Data Book 1986; U.S. Bureau of the Census, Census of Housing 1980: General Housing Characteristics Hawaii; and U.S. Bureau of the CensusCensus of Population and Housing 1980: Census Tracts Hawaii, Selected Areas

The Study Area's housing unit supply increased 75 percent from 669 units in 1970 to 1,170 units 2000. In 2000, the Study Area's housing supply accounted for 39 percent of the island's housing units.

2.4. Demographics

2.4.1. Age and Ethnicity

Moloka'i's resident population tends to be younger than the State as a whole. In 1990 and 2000, the State's median age was 32.6 years and 36.2 years, respectively. As Table 4 shows, Moloka'i's median age was 30.6 years in 1990 and 34.25 years in 2000.

Table 4: Study Area Age and Ethnicity, 1990 and 2000

	1990				2000			
	State of Hawaii	Molokai	Primary Study Area *CT 318*	East Molokai *CT 317*	State of Hawaii	Molokai	Primary Study Area *CT 318*	East Molokai *CT 317*
Population								
Resident Population	1,108,229	6,587	2,168	4,419	1,211,537	7,257	2,569	4,688
Age								
Under 5 years	7.5%	10.4%	9.6%	10.8%	6.5%	7.4%	7.9%	7.1%
5 to 17 years	20.5%	27.5%	28.5%	27.0%	20.6%	25.5%	26.5%	24.9%
18 to 44 years	42.4%	31.8%	31.6%	31.9%	36.8%	30.9%	31.8%	30.5%
45 to 64 years	18.3%	18.1%	19.3%	17.4%	22.9%	22.7%	21.0%	23.7%
65 or older	11.3%	12.3%	11.0%	12.9%	13.3%	13.5%	12.8%	13.8%
Median Age	32.6 years	30.6 years	30.4 years	30.8 years	36.2 years	34.25 years	32.9 years	35.6 years
Ethnicity								
Caucasian*	33.4%	17.5%	18.4%	17.0%	24.3%	13.8%	12.6%	14.4%
Chinese*	6.2%	1.2%	1.1%	1.3%	4.7%	0.6%	0.5%	0.7%
Filipino*	15.2%	20.6%	20.8%	20.5%	14.1%	12.6%	9.8%	14.1%
Japanese*	22.3%	8.7%	6.2%	10.0%	16.7%	4.4%	3.5%	4.8%
Hawaiian*	12.5%	49.0%	50.7%	48.2%	6.6%	34.1%	39.6%	31.1%
Part Hawaiian**	n/a	n/a	n/a	n/a	13.9%	18.3%	18.0%	18.4%
Other	10.4%	2.9%	2.8%	3.0%	19.8%	16.3%	15.9%	16.5%

** indicates that the 2000 numbers identify those who claim one race only.*

*** indicates that the 2000 numbers identify those who claim two or more races, one of which is Native Hawaiian. The State data includes up to five races, Moloka'i up to three races only.*

**** indicates that the 2000 number identifies those who claim one or more races.*

Source: Census 1990, Summary Tape File 1; Census 2000 Summary Tape File 1; The State of Hawaii Data Book 2000; and The Maui County Data Book 1998

In terms of specific age groups, Moloka'i had a larger minor population (17 years and younger) and a smaller working age population (18 years to 64 years) compared to the State age profile. Moloka'i's minor population accounted for one-third of the total population, compared to the State's 27 percent. Moloka'i's working age population accounted for 54 percent of the total population, compared to the State's 60 percent.

Mirroring the island's aging trend, the Study Area and East Moloka'i experienced higher median ages in 2000, with 32.9 years and 35.6 years, respectively. The Study Area tended to be younger than East Moloka'i, however. Over 34 percent of West Moloka'i was 17 years old or younger, compared to 32 percent in East Molokai. Also, 12.8 percent of West Moloka'i was 65 years and older, which was lower than 13.8 percent in East Moloka'i in the same category.

A detailed analysis of ethnic trends is not possible due to the methodology differences in gathering information between the 1990 and 2000 census taking. In 1990, census respondents were required to select a single ethnic category. In 2000, multi-ethnic respondents were allowed to select the appropriate number of categories. Ethnicity statistics from the two periods are not comparable, and analysis is confined to same year statistics.

In 1990, the largest ethnic categories in the State were Caucasian (33 percent), Japanese (22 percent), and Filipino (15 percent). Hawaiians made of 12.5 percent of the State population. In Moloka'i, Hawaiians accounted for 49 percent of the 1990 population. Filipinos made up the second largest category (21 percent), followed by Caucasians (17 percent). The 1990 ethnic profiles in the Study Area and East Moloka'i are similar in terms of largest ethnic groups.

In 2000, the State's largest ethnic categories continued to be Caucasian (24 percent), Japanese (17 percent) and Filipino (14 percent). Hawaiians and part Hawaiians made up 20 percent of the State population.

Moloka'i's Hawaiian population continued to be the largest group in 2000, making up 52 percent of the total population. Thirty-four percent reported being a single race, and 18 percent reported being part Hawaiian. The Study Area had a higher proportion of Hawaiians (58 percent) than East Moloka'i (50 percent).

In both the Study Area and East Moloka'i, Caucasians made up the second largest ethnic category, at 13 and 14 percent, respectively. The third largest group, Filipinos accounted for ten percent of the Study Area and 14 percent of East Moloka'i.

2.4.2. Housing and Households

In 1990, the housing vacancy rate in Moloka'i was significantly high. As indicated in Table 5, 26 percent of the housing units were vacant, compared to nine percent in the State housing supply.

In terms of types of housing occupancy in 1990, when compared to the State, Moloka'i had proportionally more owner occupied homes. Moloka'i's 1990 median value of owner-occupied units at $100,250 was significantly lower than the State median of $245,300. Moloka'i's median rent was also lower at $279, compared to the State's median rent of $599.

Table 5: Study Area Housing Units and Households, 1990 and 2000

	1990				2000			
	State of Hawaii	Molokai	Primary Study Area *CT 318*	East Molokai *CT 317*	State of Hawaii	Molokai	Primary Study Area *CT 318*	East Molokai *CT 317*
Housing Units								
Number	389,810	2,731	956	1,775	460,542	3,013	1,170	1,843
Occupied	91.4%	74.2%	64.7%	79.3%	87.6%	76.5%	66.5%	82.9%
By Owner	*53.9%*	*63.0%*	*61.4%*	*63.7%*	*56.5%*	*64.1%*	*67.1%*	*62.6%*
By Renter	*46.1%*	*37.0%*	*38.6%*	*36.3%*	*43.5%*	*35.8%*	*32.4%*	*37.6%*
Vacant	8.6%	25.8%	35.3%	20.7%	12.4%	23.5%	33.5%	17.1%
Median Value of Owner Occupied Units	$245,300	$100,250	$84,600	$115,900	$272,700	$143,150	$131,400	$154,900
Median Value of Renter Occupied Units*	$599	$316	$279	$353	$721	$518	$503	$533
Households								
Number	356,748	2,013	678	1,335	403,572	2,309	779	1,530
Average Size	3.01	3.31	3.50	3.12	2.92	3.18	3.30	3.06
Families	266,439	1,584	571	1,013	289,012	1,760	634	1,126
Average Size	3.48	3.77	3.84	3.69	3.42	3.63	3.67	3.58
Nonfamily/Individual	90,309	429	107	322	114,560	549	145	404

Source: Census 1990, Summary Tape File 1; Census 2000 Summary Tape File 1; The State of Hawaii Data Book 2000; and The Maui County Data Book 1998

In 2000, the State's housing vacancy rate increased to twelve percent, and the housing vacancy rate in Moloka'i continued to be high at 24 percent. The proportion of owner-occupied homes in both the State and Moloka'i increased slightly. Moloka'i's median value of owner-occupied homes was $143,150, which was lower than the State median value of $272,700. The island's median rent of $518 was lower than the State median rent of $721.

The Study Area had a significantly high housing vacancy rate in 2000 at 34 percent, which was almost double East Moloka'i's vacancy rate. Of the Study Area's occupied units, 32 percent were rentals, which is lower than the 38 percent rentals in East Moloka'i.

The median value of owner-occupied homes in the Study Area was $131,400, which was lower than East Moloka'i's median of $154,900.

Moloka'i's households have been and continue to be larger than State averages. In 1990, the State average household size was 3.01 persons, while Moloka'i had an average of 3.31 persons. The Study Area average household size was a high 3.5 persons.

Family sizes were correspondingly high. The 1990 State average family size was 3.48 persons; in Moloka'i, 3.77 persons.

These trends continued in 2000. While the State average household size was 2.92 persons, Molokai's average was 3.18 persons. The Study Area average household size was 3.3 persons. Family sizes in Molokai and the Study Area also significantly exceeded the State average.

2.4.3. Education and Labor Force

Both the State and Moloka'i educational profiles improved from 1990 to 2000. In 1990, 20 percent of those 25 years and older did not graduate from high school, as shown in Table 6. In Moloka'i, 34 percent did not complete high school as of 1990.

By 2000, only 15 percent of the State population 25 years and older did not complete high school, and 56 percent had attended college.

By 2000, the Moloka'i non-graduation rate decreased to 22 percent and the Study Area and East Moloka'i rates decreased as well. Forty percent of the Study Area residents had graduated from high school as of 2000, and another 36 percent attended college. College attendance was higher in East Moloka'i, at 42 percent.

Table 6: Study Area Education and Labor Force, 1990 and 2000

	1990				2000			
	State of Hawaii	Molokai	Primary Study Area *CT 318*	East Molokai *CT 317*	State of Hawaii	Molokai	Primary Study Area *CT 318*	East Molokai *CT 317*
Persons 25 years and older								
Less than 9th grade education	10.1%	14.7%	16.7%	13.7%	7.2%	9.9%	10.2%	9.7%
High school education, no graduation	9.8%	19.7%	17.3%	20.8%	8.2%	12.0%	14.0%	11.0%
High school education, includes equivalency	28.7%	32.1%	32.9%	31.7%	28.5%	38.0%	40.0%	37.0%
Some college, no degree	20.1%	14.3%	14.4%	14.3%	21.8%	20.4%	18.7%	21.4%
College degree, Associates	8.3%	6.8%	9.5%	5.5%	8.1%	5.9%	6.2%	5.7%
College degree, Bachelors	15.8%	8.7%	7.0%	9.4%	17.8%	9.5%	6.7%	10.9%
College degree with masters, graduate or professional degree	7.1%	3.7%	2.2%	4.5%	8.4%	4.3%	4.2%	4.4%
Persons 16 years and older								
Civilian Labor Force	61.8%	60.6%	64.6%	58.6%	56.6%	50.8%	49.1%	51.7%
Armed Forces	6.3%	0.0%	0.0%	0.0%	4.1%	0.0%	0.0%	0.1%
Not in Labor Force *	29.6%	35.7%	32.1%	37.6%	35.5%	42.6%	44.6%	41.6%
Unemployed **	2.3%	3.6%	3.3%	3.8%	3.8%	6.5%	6.3%	6.6%
Occupations - Civilian Labor Force* **								
Management and professional	26.4%	23.0%	19.8%	24.8%	32.2%	28.5%	27.9%	28.8%
Service	17.6%	25.0%	26.8%	24.0%	20.9%	27.8%	26.0%	28.7%
Sales & Office	32.6%	21.8%	17.5%	24.3%	28.1%	18.3%	19.0%	17.9%
Farming, fishing and forestry	2.9%	11.4%	15.4%	9.2%	1.3%	7.6%	7.6%	7.6%
Production, transportation and material moving	10.5%	6.7%	7.5%	6.2%	8.9%	8.7%	10.1%	8.1%
Construction, extraction, and maintenance	10.0%	12.1%	13.1%	11.5%	8.6%	9.1%	9.4%	9.0%

** Not in Labor Force includes all people 16 years old and over who are not classified as members of the labor force. Consisting mainly of students, housewives, retired workers, people not looking for work, etc.*

*** Unemployed includes all civilians 16 years old or over who are neither "at work" nor "with a job but not at work" during the reference week, and who were looking for work during the last 4 weeks, and were available to start a job.*

For Native Hawaiians on Moloka'i, the high school graduation rate was a high 50 percent and another 30 percent attended college. [3]

In 1990, the labor participation profile was similar in the State and Moloka'i island, but there were differences between the Study Area and East Moloka'i. Respectively, 61 percent and 60 percent of the State and Moloka'i labor population participated in the civilian labor force in 1990. The Study Area had a higher participation rate (65 percent) than East Moloka'i (59 percent).

[3] *Office of Hawaiian Affairs,* ***Native Hawaiian Data Book, 2006,*** *page 50.*

In 1990, 36 percent of Moloka'i's working population was not in the labor force, and non-participation was particularly high in East Moloka'i at 38 percent. 1990 unemployment was also high in East Molokai at 3.8 percent, compared to 3.6 percent island wide.

By 2000, proportionally more Moloka'i residents did not participate in the labor force or were unemployed. While over 50 percent of Moloka`i residents were in the civilian labor force, another 43 percent did not participate in the labor force. Further the 2000 unemployment rate was high at 6.5 percent. Census statistics for the Study Area and East Moloka'i were similar.

For Native Hawaiians on Moloka'i, the civilian labor force participation was higher at 59 percent, and 41 percent were not in the labor force. Another 8.5 percent was unemployed. [4]

The unemployment rate for Moloka'i has increased to 8.5 percent by June 2006. The State unemployment rate at that time was 3.7 percent. [5]

In terms of occupations, the largest category of occupation in 1990 in the State was sales and office (33 percent). For Moloka'i in 1990, the largest category was service (25 percent), followed by management and professional (23 percent). Service occupations comprised the largest category in the Study Area in 1990.

In 2000, the largest occupational category in the State and Moloka'i shifted to management and professional, with 32 percent and 29 percent, respectively. Service occupations comprised the second largest occupation in Moloka'i; in the State, sales and office occupations were second.

In the Study Area, management and professional and service occupations accounted for the two largest groups of occupations. There was a significant decrease in farming, fishing and forestry occupations in the Study Area. In 1990, 15 percent were in this category, and this decreased to eight percent in 2000.

2.4.4. Income and Poverty

In 1990 and 2000, Moloka'i's median household and family incomes have been consistently and significantly lower than statewide medians. Census information indicates some improvement in terms of dependence on public assistance income from 1990 to 2000.

[4] *Ibid, page 143.*

[5] *Personal Communication with Robin Komoto from the State of Hawaii Department of Labor and Industrial Relations, August 1, 2006.*

As indicated in Table 7, Moloka'i's 1990 median household income of $25,923 was $12,906 less than the State's median household income of $38,829. The differential was similar for family income. In 1990, Moloka'i's median family income of $29,973 was $13,000 less than the State's median family income of $43,156.

Table 7: Study Area Income and Poverty, 1990 and 2000

	1990*				2000*			
	State of Hawaii	Molokai	Primary Study Area *CT 318*	East Molokai *CT 317*	State of Hawaii	Molokai	Primary Study Area *CT 318*	East Molokai *CT 317*
Median Household Income	$38,829	$25,923	$26,522	$25,324	$49,820	$34,184	$33,969	$34,398
Households w/ Public Assistance Income	7%	20%	19%	20%	7%	14%	12%	15%
Median Family Income	$43,176	$29,973	$31,895	$28,051	$56,961	$36,973	$34,907	$39,038
Median Nonfamily/Individual Income	$24,376	$10,591	$10,764	$10,417	$30,272	$18,367	$20,795	$15,938
Per Capita Income	$15,770	$9,622	$10,075	$9,169	$21,525	$15,355	$15,715	$14,994
Percent Below Poverty Levels								
Households	14.3%	35.4%	19.4%	43.8%	18.3%	37.0%	35.0%	38.2%
Families	6.0%	15.1%	8.9%	18.6%	7.6%	16.0%	15.5%	16.3%
Nonfamily/Individual	8.3%	20.3%	10.4%	25.2%	10.7%	21.0%	19.5%	21.9%

** Poverty status data reflects only the year prior to the census (1990 uses data from 1989; 2000 uses data from 1999)*

*** Poverty level of a person is measured by comparing one's total family income in the last 12 months with the poverty threshold appropriate for that person's family size and composition. If the total income of that person's family is less than the threshold appropriate for that family, then the person is considered poor or "below poverty level". The thresholds (income cutoffs) are arranged in a matrix that takes into account family size and the presence and number of children under 18.*

Sources: Census 1990, Summary Tape File 3; Census 2000 Summary File 4; The State of Hawaii Data Book 2000; and American Coomunity Survey 2004 Subject Definitions

In 2000, the difference between the State and Moloka'i median household incomes increased to $15,636. For median family incomes, the difference was more pronounced at almost $20,000.

While statewide households with public assistance remained steady between 1990 and 2000, Molokai's proportion decreased from 20 percent in 1990 to 14 percent in 2000. Both the Study Area and East Moloka'i followed this decrease in public assistance for households.

Note that income pattern in the Study Area and East Moloka'i changed from 1990 and 2000. In 1990, the Study Area's median household, family and individual incomes were higher than East Moloka'i. In 2000, the situation reversed, although the per capita income in the Study Area remained higher.

In terms of poverty levels, Moloka'i had consistently higher levels that the State. In both 1990 and 2000, Moloka'i's proportion of households, families and individuals with incomes below poverty level was more than double those of the State.

While Moloka'i's proportion of households with incomes below poverty level increased by less than two percent between 1990 and 2000 (compared to the State's four percent increase), there were significant changes in the two census tracts. In the Study Area, the household poverty category almost doubled, from 19 percent to 35 percent. In East Moloka'i, the household category decreased from 44 percent in 1990 to 38 percent in 2000.

3. Major Forces for Change

This section identifies forces for change in the Study Area that are independent of the proposed project. The information extends the baseline information on the social environment by exploring the type of change directed by public policy, plans, and relevant public improvement projects.

Section 3.1 presents public plans and forecasts. Section 3.2 discusses the Ten-Year Strategic Plan prepared by the Moloka'i Enterprise Community, and Section 3.3 highlights the Moloka'i Island Plan prepared by the State Department of Hawaiian Home Lands. Public improvements are presented in Section 3.4.

3.1. Public Plans and Forecasts

3.1.1. Maui County General Plan

The Maui County Charter requires that its General Plan recognize and state the major problems and opportunities concerning the needs and the development of the county and the social, economic and environmental effects of such development. The General Plan sets forth the desired sequence, patterns and characteristics of future development. Formation of the 1990 General Plan included eight regional citizen teams from Moloka'i, Lana'i and Maui. The goals of the participation program included broad-based community participation and the development of objectives and strategies to address challenges facing the County as a whole.

Five themes form the framework for the Maui County General Plan, as follows:

- Protect Maui county's agricultural land and rural identity
- Prepare a directed and managed growth plan
- Protect Maui county's shoreline and limit visitor industry growth
- Maintain a viable economy that offers diverse employment opportunities for residents
- Provide for needed resident housing

The General Plan's objective for Moloka'i is to encourage the independent economic revitalization. Policies for Moloka'i include:

- Encourage diversified industries to locate to Moloka'i that will form a stable employment base,
- Ensure that necessary infrastructure and social services are available to support new development,
- Promote alternate agricultural and aquacultural pursuits consistent with the human resources available on the island of Moloka'i,
- Discourage lengthening of the existing Moloka'i Airport runway, and discourage the State's efforts to relocate Moloka'i Airport's facilities to the west end of the island, and
- Support constructive efforts by the Moloka'i community to evaluate the feasibility of Moloka'i becoming its own County. [6]

An update of the General Plan is currently underway.

3.1.2. Moloka'i Community Plan

Maui County prepared nine Community Plans that reflect current and anticipated conditions, and advance planning goals, objectives, policies and implementation considerations of the General Plan. The Moloka'i Community Plan provides specific direction to address these components within Moloka'i's values and unique attributes. The Moloka'i Community Plan was first adopted by Ordinance No. 1357 in 1984, and was updated in 2001.

The Moloka'i Community Plan identified key problems that provided the underlying basis for the planning goals, objectives and policies. These problems included:

- Limited economic opportunity, which is the most significant problem facing the community,
- Need to upgrade infrastructure,
- Lack of community control over local decisions,
- Lack of social and recreational facilities and public services,
- High cost of housing, and
- Lack of sufficient water resources.

[6] *Maui County General Plan 1990 Update, available online at www.co.maui.hi.us/departments/Planning/generalPlan1990.htm*

The Plan then identified goals as broad statements that identify a preferred future condition. Each goal was accompanied by objectives and policies, as well as implementing actions. Goals that are particularly relevant to this SIA are as follows:

- Land Use: Enhance the unique qualities of the island of Moloka'i to provide future generations the opportunity to experience rural and traditional lifestyles.
- Subsistence: The continued practice of subsistence as part of the Moloka'i lifestyle which incorporates and fosters the traditional and cultural values of conservation, mālama 'aina and 'auwana.
- Environment: Preserve, protect and manage Moloka'i's exceptional natural land and water resources to ensure that future generations may continue to enjoy and protect the island environment.
- Cultural Resources: Preservation, enhancement and appropriate use of cultural resources, cultural practices and historic sites that provide a sense of history and define a sense of place for the island of Moloka'i.
- Economic Activity: A balanced local economy which provides preferred employment levels, long-term viability and sustainability while meeting residents' needs, respecting cultural and natural resources, and is in harmony with Moloka'i's rural quasi-subsistence lifestyle.
- Housing: Housing opportunities which are affordable, safe and environmentally and culturally compatible for the residents of Moloka'i.
- Social Infrastructure: An efficient and responsive system of people-oriented public services which enable residents to live a safe, healthy and enjoyable lifestyle.

Goals related to indigenous architecture, design, infrastructure, government and the Department of Hawaiian Home Lands are also contained in the Moloka'i Community Plan.

In the Study Area, various amendments to the Land Use Map were made in the 2001 update in the Study Area. The largest revision was to redesignate approximately 593 acres in Maunaloa to Park (Golf Course).

The Moloka'i Community Plan designates specific areas in the Project site Agriculture and Conservation. Molokai Ranch will seek to amend the Community Plan to change the area of the proposed houselots from Agriculture to Rural.

3.1.3. Socio-Economic Forecasts

The Maui County Planning Department developed a socio-economic forecast in preparation for the 2006 General Plan Update. The forecast serves as a planning tool to predict future growth scenarios, and is based on projections developed by the State Department of Business, Economic Development and Tourism.

The model in this forecast is not designed to predict short-term economic cycles. Rather, it provides estimates of long-term trends. Actual conditions will diverge on a short term basis within the long-term time frame.

The baseline forecast for Moloka'i incorporates historical information and forecasts growth in population and jobs. Unemployment is projected as declining over time as the local economy becomes more similar to that of other Maui County islands. Table 8 contains socio-economic forecasts.

Table 8: Socio-economic forecasts for Moloka'i, 2005 to 2030

	Historical	Historical	Projected					
	1990	2000	2005	2010	2015	2020	2025	2030
Population	6,717	7,407	7,127	7,276	7,542	7,772	8,068	8,395
Households	2,088	2,420	2,382	2,475	2,603	2,722	2,862	3,006
Housing Demand	2,198	2,547	2,507	2,605	2,740	2,865	3,013	3,164
New Resident Demand	n/a	n/a	131	137	148	132	144	145
New Non-Resident Demand	n/a	n/a	-51	124	169	157	186	190
Visitor Units	559	429	429	429	429	429	429	429
Labor Demand *	2,519	2,746	2,764	3,057	3,342	3,588	3,792	3,997
Unemployment	10.3%	14.0%	12.5%	9.0%	6.5%	4.0%	4.0%	4.0%

** Labor demand is estimated as total employment plus assumed market level of unemployment (4% of Civilian Labor Force). Figure for 1990 not comparable as it uses lower estimate of self-employed persons.*

Source: Maui County Planning Department, ***Socio-Economic Forecast: The Economic Projections for the Maui County General Plan 2030,*** *Exhibits I-3, I-6, I-11, I-15, I-16, I-20*

In terms of population growth, the forecast projects an 18 percent increase by 2030, from a projected 2005 population of 7,127 to a 2030 population of 8,395. This increase is the lowest in Maui County. The overall Maui County population is projected to grow by 42 percent.

3.2. Ke ʻAupuni Lōkāhi – Molokaʻi Enterprise Community

The Molokaʻi Enterprise Community, or EC, is part of the federal U.S. Department of Agriculture Enterprise Community (EC) /Empowerment Zone (EZ) Program. The EC process in the U.S. began in 1998, which included the participation from the Molokaʻi community. The EC process on Molokaʻi involved thousands of community members in hundreds of meetings. The result is a ten-year strategic plan for Molokaʻi. The U.S. Department of Agriculture designated the entire island of Molokaʻi as an Enterprise Community. To date the EC has included and supported over 40 projects in its ten-year strategic plan. Hence, this effort has significant influence over the forces for Molokaʻi's future.

This EC prepared a Community Strategic Plan with broad-based community participation. The vision statement of this plan embodies the fundamental values that provide the framework for the plan, as follows:

> *Molokaʻi is the last Hawaiian Island. We who live here choose not to be strangers in our own land. The values of aloha ʻaina and mālama 'aina (love and care for the land) guide our stewardship of Moloka'i's natural resources, which nourish our families both physically and spiritually. We live by our kūpuna's (elders) historic legacy of pule o o (powerful prayer). We honor our island's Hawaiian cultural heritage, no matter what our ethnicity, and that culture is practiced in our everyday lives. Our true wealth is measured by the extent of our generosity.*
>
> - *We envision strong 'ohana (families) who steadfastly preserve, protect and perpetuate these core Hawaiian values.*
> - *We are wise and caring community that takes pride in its resourcefulness, self-sufficiency and resiliency, and is firmly in charge of Molokaʻi's resources and destiny.*
> - *We envision a Moloka'i that leaves for its children a visible legacy: an island momona (abundant) with natural and cultural resources, people who kōkua (help) and look after one another, and a community that strives to build an even better future on the pa's (firm) foundation left to us by those whose iwi (bones) guard our land.* [7] [8],

[7] *Molokai Enterprise Community, Vision Statement, available online at http://molokaiec.org/aboutus/vision.htm*

Priorities and strategic focus for the next five years are summarized as follows:

- Compatible Community Development Process: Work with Molokai Ranch to create compatible development strategies as part of the Molokai Ranch Community-Based Master Plan.
- Community Land Trust: Create and implement a community land trust to help make the vision of Moloka'i community a reality.
- Economic Base: Create an economic base that preserves the preferred Moloka'i lifestyle, uses traditional Hawaiian culture as the foundation, and uses all the island's resources in a pono way.
- Financial Stability: Establish financial strength and stability to carry out long term goals and sustain the long term viability of Ke 'Aupuni Lōkāhi.
- Organizational Stability and Capacity: Build Ke 'Aupuni Lōkāhi's technical, management, leadership and adaptive capabilities.

The Strategic Plan identifies two goals expected to build momentum and leverage Ke 'Aupuni Lōkāhi's resources, as follows:

1. Develop Moloka'i's economic base in ways that 1) maintain Moloka'i's preferred lifestyle; 2) builds on Native Hawaiian culture; 3) protects Moloka'i's natural resources for future generations; 4) generates employment and economic opportunities for local residents; and 5) are community driven.
2. Strengthen Ke 'Aupuni Lōkahi's technical, management, leadership and adaptive capacities to effectively support its ongoing programs, projects, and initiatives.

Collectively, the goals have seven action areas which are related in some way to the Community-Based Master Land Use Plan. In general, the action areas strengthen the community's ability to carry out the strategies, and specifically call for the establishment of a community land trust and the creation of employment and economic opportunities as related to the reopening of Kaluako'i. [9]

[8] *This vision statement was subsequently used in the 2001 Moloka'i Community Plan.*

[9] *Ke 'Aupuni Lōkāhi – Leaders Working Together, Strategic Plan Summary (undated).*

The EC also prepared a community-based visitor plan for the island. Community tourism is defined as a process by which a community is empowered to share its greatness while preserving its dignity. It is small in scale and driven by a genuine desire of the community to share itself, its history, traditions, and customs with strangers, as a means by which to support economic growth.

This Moloka'i initiative is a process-oriented tourism that differs from the tourist destination areas approach used to sell "culture" to visitors. Community Tourism allows the participating residents to share their living culture in a natural setting with small, manageable groups of visitors. The types of cultural settings, community events, cylindrical festivities and sports gatherings offered will depend on residents' willingness and breadth of sharing a rural and cultural lifestyle.

Community Tourism is activity oriented with the community making decisions on what is shared, breadth of cultural activities to be shared to promote greater understanding and appreciation of the island's heritage. An intimate interaction between host and guests benefits both. The activity shared with guests exists for its own sake and is not artificial, something created to entertain.

Community Tourism places limitations on the numbers of tourists an area or activity can sustain so that the island will not be overwhelmed by masses of visitors distracting daily rural living. The Community Tourism travel initiatives and offerings are operated by local, indigenous, traditional populations to promote their lifestyle, preserve their traditions, environment and cultural assets. Engaging visitors on the community's terms empowers the host culture, preserving a sense of place and dignity.

The Community Tourism Plan was conceived as a five-year implementation process involving community participation in gathering data on promotional activities, scheduling events, resident activity participants and requiring a Visitor Coordinator and Committee oversight.

The important initial step upon which the plan rests is establishing an agreement on the tourism carrying-capacity for the island. A monthly calendar of events for each year will be created such as geo-tours, rodeo, Makahiki, and many others for families with keiki. [10]

[10] *Davianna Pōmaika'i McGregor, PhD,* ***Moloka'i Responsible Tourism Initiative: A Community-Based Visitor Plan for Moloka'i" (****February 2006).*

3.3. Department of Hawaiian Home Lands

Development of State Department of Hawaiian Home Lands, or DHHL, properties has been and is a major force for change in Moloka'i. Moloka'i DHHL lands are situated in 'Ualapu'e, Kapa'akea, Makakupa'ia, Kamiloloa, Kalama'ula, Kalaupapa, Pālā'au, and Ho'olehua. These holdings comprise 25,899 acres, or 16 percent of the island's total acreage.

DHHL prepared the Moloka'i Island Plan, or MIP, in June 2005. The MIP provides recommendations for the future use its land holdings and identifies priority areas for homestead development. Highlights of the MIP recommendations are as follows:

- Residential Homesteads: The MIP proposes 417 new residential homesteads, with priorities focusing on 'Ualapu'e, Kapa'akea, Makakupa'ia and Kamiloloa. A target of 361 units is identified as priorities. Currently, DHHL residential areas encompass 742 acres.
- Agriculture Homesteads: The MIP calls for completion of 58 Naiwa agricultural lots in Ho'olehua that were previously awarded. In addition, the MIP includes the subdivision of Ho'olehua lands that could yield 544 agriculture lots. Currently, 2,350 acres are designated for Subsistence Agriculture; for Supplemental Agriculture, 5,862 acres.
- Pastoral Homesteads: Currently, 1,927 acres are designated for pastoral use.
- General Agriculture: This designation preserves land for future use, and makes it available for farming and ranching leases. Currently, over 8,498 acres are designated for general agriculture.
- Special District: Areas that are environmentally or culturally sensitive are in this designation. Comprising 5,558 acres, lands in this category are to be protected, and are made available for certain community and community uses.
- Community Use: Community Use designated areas are located in residential communities and accommodate schools, park sites and community use areas. Currently 224 acres are in this category.
- Conservation: Environmentally sensitive areas in Kalaupapa and Ho'olehua comprise the 655 acres in this category.
- Commercial: These lands are designated for DHHL income generation and encompass 58 acres in Kalama'ula and Ho'olehua.

- Industrial: Sixteen acres in Kapa'akea are in this category. [11]

3.4. Public Improvements

In general, most of the public improvements in Maui County's Fiscal Year 2006, 6-Year Capital Improvement Program are related to relatively minor upgrades and improvements. County projects related to socially-relevant public services and facilities are as follows:

- New Kaunakakai Fire Station, Government Facilities
  Fire and Public Safety Department: Design and construction of a new station.

- New Moloka'i Baseyard**,** Government Facilities
  Public Works and Environmental Management – Engineering Division: Buy six contiguous lots at the Moloka'i Industrial Park, design and build new baseyard.

- New Moloka'i Police Station, Government Facilities
  Police Department: A new station will bring a sense of pride and importance not only to the employees of the Police Department, but also to the residents of Moloka'i.

- New Pukoo Fire Station, Government Facilities
  Fire and Public Safety: Construction of a new fire station in Puko'o.

In terms of State projects, planned improvements are mostly minor improvements and upgrades. The Department of Transportation, Airports Division, prepared a master plan for Ho'olehua Airport. Highlights of the two phases of improvements are as follows:

Phase 1 (1998 – 2005)

- Resolve impacts for Runway 5-23 improvements on Hawaiian Homestead land

- Mass grade approximately 360,000 cubic yards of excavation northeast of Runway 5-23

Phase 2 (2006 – 2020)

- Resolve impacts for Runway 5-23 improvements on Hawaiian Homestead land for Runway 5-23 extension and other improvements needed to satisfy FAA regulations and design criteria.

[11] *Group 70 International,* ***Moloka'i Island Plan: Executive Summary****, prepared for the State Department of Hawaiian Home Lands (June 2005), pages ES2 to ES4.*

- Extend Runway 5-23 by 500 feet to the southwest
- Construct new passenger terminal building, new aircraft parking apron and new cargo building
- Develop new general aviation hangars, new helicopter apron, new passenger terminal roadways, and new parking lot. [12]

Implementation of this master plan is undetermined.

[12] *Engineering Concepts, etal.,* ***Moloka'i Airport Master Plan Final Report,*** *Prepared for the State of Hawaii Department of Transportation, Airports Division (May 1999), pages 6-5 to 6-11.*

4. Preliminary Community Issues

Impacts are changes that may occur as a result of a proposed action, plan or policy. Issues are reactions and opinions. Issues can change over time, as people's priorities and values change.

Issues analysis helps decision-makers identify and analyze community concerns about a proposed action. To ensure that a proposed action is reviewed in the full social context in which the project is proposed, feelings and concerns about the existing community need to be considered as well. For example, it is helpful to understand if a project is unique in terms of its issues, or if reactions are consistent with other proposed changes.

Issues analysis differs from statistical surveys, the latter of which is designed to focus on frequency of reactions. Polls are valuable because they tell us about the opinions of the majority or the minority. The survey instrument is not conducive to dialogue, however, and the personalized reasons for these opinions are not evident, or need to be inferred from the responses.

In contrast, the only time we make reference to the quantity of opinion in issues analysis is where there is significant difference of number or a distinct trend.

Section 4.1 discusses the approach for the issues analysis, and describes the three sources of community input. Section 4.2 presents findings related to feelings about respondents' relationships to Moloka'i and their definition of "Moloka'i Style." Section 4.3 presents reactions to the Plan, and reactions to the Project are summarized in Section 4.4. Section 4.5 presents community suggestions, and Section 4.6 presents our analysis.

4.1. Approach and Participants

This issues analysis is crucial in understanding the full context of issues important to a broad cross section of people. Given the high-profile nature of both the Plan and the Project, there has been much publicized opinion both for and against the Plan and the Project. For a thorough issues analysis, it is important to identify not just issues important to vocal individuals, but also issues important to those whose opinions have not been featured in the media or expressed in public meetings.

Hence, a major objective of this analysis was to capture the opinions of a broad cross section of the community, regardless of previous media coverage, publicized opinion, public testimony or any other venue for taking a public stance. We made every effort to reach both prominent community members, as well as the "silent majority" to understand the full breadth of public opinion on the Plan and the Project.

Although the venues and participants varied, there was a common line of questions that followed a basic approach.

- *What is Moloka'i Style?* In our research and experience in other meetings, there was an underlying theme of a Moloka'i identity. People often assessed activities behavior and attitudes based on whether or not it was reflective of a Moloka'i value or behavior. There seemed to be a common understanding shared by residents of what constitutes a Moloka'i identity. To understand issues related to the Plan and the Project, it was therefore necessary to place these in the context of "Moloka'i style."

- *The Community Based Master Land Use Plan and Lā'au Point:* As discussed in Section 1, the Project has an integral relationship with the Plan. Hence, after we asked questions about Moloka'i style, we described the Plan and the Lā'au Point project that is the subject of the Land Use Commission petition. We then asked for reactions to both.

- *Relationship of the Plan and Project to Moloka'i Style*: Participants were then asked to relate their feelings about the Plan and Project to their perspective on Moloka'i Style. They were also asked to share suggestions.

Three sources of information were used, including 1) a public information meeting, 2) several focus groups and 3) community interviews. Subsequent sections describe the venue and participants of each source.

4.1.1. Public Information Meeting

A public meeting was held to discuss social impacts related to the Community Based Master Land Use Plan and the proposed project at Lā'au Point. The meeting was held at Kaunakakai Elementary School cafeteria on July 26, 2006, 6:00 PM. It was publicized in local newspapers.

Approximately 32 people attended, and Table 9 lists the 27 participants who signed in.

Table 9: List of People Who Signed In at the Public Meeting

Marcia Allison	Cummins K Mahoe III
Bob Boylan	Michael Martin
Marilyn Burgin	Abbey Mayer
Cheryl Corbiell	Steve Morgan
Harold Edwards	Guy Hanohano Naehu
Tom Holloman	Peter Nicholas
Illona Honig	Josh Pestrana
Elizabeth Johnson	Brennan Purtzer
William Kaholoaa, Sr.	Kalaniula Ritte
Bill Kapuni	Yogesh Simpson
Victoria Kapuni	Glenn Teves
Sol Kawai, Jr.	Bree Ullman
Cynthia Luafalemana	Matt Yamashita
Uya-Justina Luafalemana	

At least five people chose to not to add their names to the sign-in sheet. At the meeting, they said they did not want their names to be used in a way that might construe support of the Plan or Project.

Although the agenda was loosely followed, and some people objected to the questions and presentation of the Plan, participants generally discussed relevant topics. Participants who spoke at the meeting were adamant in their opposition to the Plan and Project.

Not all participants voiced their opinion, and it is not assumed that the spoken opinions were unanimous. It was clear, however, that all who spoke were in opposition. One person submitted written comments and it is presented in Appendix A. Input from this meeting is incorporated in the overall analysis.

4.1.2. Focus Groups

Focus groups are essentially meetings that serve as focused interviews of a group of people. While individual interviews provoke thought and elicit personal views, focus groups add another dimension with group exchange and dynamics. In this analysis, focus groups were selected as another avenue for input to optimize the number of contacts within a limited time frame.

Also, focus group meetings provide an opportunity for group exchange outside the typical public meeting. In our review of media coverage of public meetings on controversial subjects in Moloka'i, discussions tend to be confrontational and heated. The focus groups sessions for this issues analysis were designed to provide non-confrontational settings. The groups were generally homogenous in that participants shared a common background or common position regarding the Plan and Project.

The format for the focus group sessions was similar to that of the public meeting. Earthplan contacted a member of the group, and that individual was responsible for extending invitation to his or her peers. Each group had a unique perspective and participants and general characteristics are hereby described.

- Maunaloa residents

  Maunaloa is the town closest to the Project site. A focus group session was held with a group of these residents on July 25, 2006 in the Lōkahi Room at the Molokai Lodge. Table 10 lists the ten participants.

Table 10: Participants in Maunaloa Residents Focus Group Session

Zhantell Dudoit	Janice Pele
Raymond Hiro	John Pele
Roxanne Hiro	Bo Perez
Kalapana Keliihoomalu	Brennan Purtzer
Davianna McGregor	C. Kehau Pule

  One person lived outside Maunaloa on the West End and was invited by a participant. One lived elsewhere but worked in Maunaloa, and another person attended as an observer.

  In general, participants were supportive of the Plan and the Project. They were hopeful that the Project would improve economic conditions and that the Plan would preserve cultural and environmental resources. Further, they expressed a desire for effective implementation that avoids mismanagement and unfair personal gain. Input from this session is incorporated in the overall analysis.

- West End residents

  Residents of Kaluako'i and Pāpōhaku Ranch are in close proximity to the Project and would have direct contact with Project activities and residents. A focus group session was held with a group of these residents on July 31, 2006 in the Lōkahi Room at the Molokai Lodge. Table 11 lists the ten participants.

Table 11: Participants in West End Residents Focus Group Session

George Benda	Keith Rasmussen
Pat Benda	Carol Tahmoush
Bob Dreyer	Mike Tahmoush
Joseph Pentak	Raymond Tensfeldt
Barbara Rasmussen	Yvonne Wheeler

Some of these people participated in the preparation of the Plan, and are active in community efforts. In general, they felt that the Plan was acceptable. Their primary reaction to the Project was its effect on their community in terms of infrastructure and public services. They envisioned opportunities to improve these facilities with the development of the project and several suggestions were offered. Input from this session is incorporated in the overall analysis. Two people submitted written comments and these are contained in Appendix B.

- Filipino residents

  Our initial research indicates that while people of Filipino ancestry comprise the third largest ethnic group in Moloka'i, they tended to avoid public meetings and controversial settings. This group was therefore considered part of the silent majority. A focus group session was held with a group of these residents at a private residence on July 27, 2006. Table 12 lists the 24 participants.

Table 12: Participants in Filipino Focus Group Session

Estefonia Acoba	Erlinda Oasary
Cresencia Befitel	Sylvia Pabalan
Sara Bongolan	Benny Piros
Tess Bongolan	Fely Piros
Adelina Cera	Leo Piza
Stanley Cera	Catalina Rabara
Annabelle Clemente	Ben Ragonton
Jerry Clemente	Perlita Ragonton
Debbie Davis	Elena Ragonton
Rudy Lat	Navario Ragonton
Francisco Mercado	Lawrence Reyes
Leonida Molina	Yolanda Reyes

These participants tended to be supportive of both the Plan and the Project due to perceived low negative impacts and the benefits of the Project's employment generation. They appreciated the reopening of Kaluako'i Resort, affordable housing and resource conservation. Input from this session is incorporated in the overall analysis. Two people submitted written comments and these are contained in Appendix C.

- Alternatives to Lā'au Point Committee

  During the formation of the Plan, the Alternative to Lā'au Point Development Committee, hereafter referred to as ALDC, was formed to:

  > Create an alternative document that speaks to sustainable economic models that encompasses MPL lands, particularly Ke Lae Lā'au
  >
  > To ensure the establishment of a sustainable community land trust which serves as the mechanism for responsible land management
  >
  > To develop viable fundraising strategies to support the implementation and sustainability of those efforts. [13]

  A focus group session with people who were active in the ALDC was held on July 28, 2006 in a private office. Table 13 lists the five participants.

Table 13: Participants in Alternatives to Lā'au Development Committee Focus Group Session

Mahealani Davis
Kekama Helm
Josh Pestrana
Mikiala Pescaia
Matt Yamashita

All were participants in both the formation of the Plan and the ALDC report. This group was critical of the community-based process in the development of the Plan; they believed that the report on alternatives was not genuinely considered in the decision-making process. Further, as may be surmised by the name of the committee, this group disapproved of the Project. Input from this session is incorporated in the overall analysis.

[13] *New West Land Company, etal., **Report to the Ke 'Aupuni Lōkāhi, Inc., Moloka'i Enterprise Community (EC)** (October 8, 2005), page 3.*

4.1.3. Community Interviews

The most extensive effort in this issues analysis focused on interviews of community members. Three interviewers conducted most of the interviews over a one and a half-week period. Most of the interviews were held in person; a few telephone interviews were conducted as requested.

Our primary objective was to learn about the existing community and how the Plan and Project would relate to people's feelings and community values. Hence, though the interview questions were standard, we also allowed for flexibility so that those interviewed could converse, or "talk story," in a manner that was comfortable for them.

Interviewees were informed that their names and affiliations would be listed in this report. We noted that the affiliations and organizational information was solicited to provide the readers an indication of the interest base of those interviewed. People spoke as individuals, and did not represent or speak for their organizations.

They were further informed that their individual conversations were confidential, and that their comments would be collectively analyzed. Confidentiality was very important for those who were concerned that their individualized views may be publicized and that they would be criticized by people who oppose the Plan or Project.

Because of the interviews afforded more personal interaction than group meetings, we expanded the areas of questions as follows:

- Relationship with Moloka'i
- Description of Moloka'i Style
- Hopes for the future of Moloka'i, for their children and grandchildren
- Reactions to the overall Plan (not just the Lā'au Point portion)
- Reactions to the Project as part of the Plan and by itself
- Relationship of the Plan and Project to Moloka'i Style
- Suggestions

As previously discussed, an understanding of the full range of feelings and concerns about a proposed project needs a broad cross-section of people. Every effort was made to contact people who are active in their community through their participation in social, educational, cultural, and economic development activities and organizations, as well as people who might not be active, but were referred to us by those interviewed.

A few people chose to participate in more than one aspect of this study. They were interviewed and also chose to attend the public meeting or a focus group. No one participated in all three activities.

Five people declined to be interviewed. Two did not want to participate because of the high profile of this project and did not want to take any kind of position. Two were concerned about being part of a study that was part of the petition to the State Land Use Commission; they did not want their participation to be construed as support. Both attended the public meeting. One person had agreed to be interviewed, but was busy at the agreed upon time.

In all, 62 people were interviewed. Those interviewed were asked to identify their organizational and other affiliations so that the reader would have an idea as to the cross section of interests reflected in this analysis. Interviewees shared their opinions as individuals, however, and were not asked to take a position for their organization. Further, individuals selected the affiliations that would be listed in this report. The list of names is provided in Table 14.

Table 14: List of People Interviewed

Name	Affiliation and Residence
Vivian "Vani" Ainoa	President of Na Pu'uwai - Native Hawaiian Health System for Moloka'i Member of Ka'ahumanu Society Kamiloloa, One Ali'i resident
Billy Akutagawa	Executive Director of Na Pu'uwai – Native Hawaiian Health System for Moloka'i Certified gun safety trainer on Moloka'i (works with the State Department of Land and Natural Resources as volunteer) Member of the Board of Directors of Moloka'i Community Health Center Past member of Moloka'i Burial Council Kaunakakai resident
Zesseca Apiki	Moloka'i Branch Manager of Maui Economic Opportunity Member of Moloka'i Chamber of Commerce Member of General Advisory Committee of Local Advisory Charter School Kaunakakai resident
Kahu Anna L. Arakaki	Kupuna Kahu of Ka Hale La'a O Ierusalem Ho'olehua Homestead resident

Name	Affiliation and Residence
Kuulei Arce	Loan Manager in Business Development Corporation, Maui Economic Opportunity Member of 4-H Club Ho'olehua resident
George Benda	Co-founder of Aka'ula School Pāpōhaku Ranchlands resident
Pat Benda	Pāpōhaku Ranchlands resident
Julie-Ann Bicoy	Director of Moloka'i Visitors Association Past elementary school teacher Kaunakakai resident
Lori Buchanan	Former Commissioner of the Moloka'i Planning Commission Owner of Moloka'i Mortuary Field Technician of Moloka'i / Maui Invasive Species Committee Ho'olehua resident
Louise Malulani Bush	Vice President of Ho'olehua Homestead Association Administrative Assistant of Kamehameha Schools Ho'olehua resident
Judy Caparida	Kupuna in Manae
Stacy Crivello	President of Board of Directors of Moloka'i Enterprise Community Ho'olehua resident
Nani Duvauchelle	Case Manager in Community Services, Maui Economic Opportunity Kaunakakai resident
Jojo Espaniolo	Kupuna Maunaloa resident
Lisa Esteron	Case Manager in Community Services, Maui Economic Opportunity Maunaloa resident
Ray Foster	Hawaiian Research, Site Manager of Monsanto President of Kawela Home Owners Association Kawela resident
Ruby Guerra	Camp Host at Kaupoa Beach Villas Shop Kualapu'u steward and secretary for ILWU unit Kualapu'u resident

Name	Affiliation and Residence
Carol Harms	Owner of Budget Car Rentals at Ho'olehua Airport West end resident
Dayna Harris	Realtor Kaunakakai resident
Donna Haytko-Paoa	Professor / Coordinator at Maui Community College in Moloka'i East end resident
Kekama Helm	Canoe club coach with Kukui O Moloka'i Hui malama o moopuni (subsistence) Works with youth project development for QLCC Ho'olehua and Kalama'ula Homestead resident
Zachary Helm	President of Kalama'ula Homestead Association Organizes and supports community recreation activities at the Maui County Parks and Recreation Department Entertainer Kalama'ula resident
Raymond Hiro	Member of Executive Board of Maunaloa 'Ohana I Lōkāhi Assocation Maintenance Foreman at the Molokai Lodge and Beach Villas Maunaloa resident
Pearl Hodgins	Executive Secretary of the Moloka'i Chamber of Commerce Vice President of Moloka'i Main Street President of Moloka'i Museum and Cultural Center Kipu resident
Karen Holt	Executive Director of Moloka'i Community Services Council Kaunakakai resident
Irene Kaahanui	Kupuna Ho'olehua Homestead resident
Jule Kamakana	Owner of Bamboo Pantry Member of Moloka'i Visitors Association Member of Moloka'i Camber of Commerce Member of Board of Directors of Aka'ula School Kalama'ula Homestead resident

Name	Affiliation and Residence
Deldrine "Kauinohea" Kapuni	Kupuna program with Alu Like Kawela resident
Halona Kaopuiki	Hoʻolehua homesteader
Irene Lam	Manager of Community Development, Molokaʻi, US Department of Agriculture Kaunakakai resident
Jina Lee	Administrator at Molokaʻi Community Health Center Kaunakakai resident
Justine Luafalamana	Student at Molokaʻi High School East end resident
Collette Machado	Hoʻolehua Homestead resident
Ruth"Manu	East End resident
Captain Dan Matsuura	Captain in Maui County Police Department, Molokaʻi Kaunakakai resident
Ed Misaki	Director of Nature Conservancy Kaualapuʻu resident
Paul Mordasini	President of the West Molokaʻi Association President of Pāpōhaku Ranchlands West end resident
Steve Morgan	Founder of West Molokaʻi Citizens Committee Head deacon at Seventh Day Adventist Church West end resident
Hanohano Naehu	Co-founder of Hemowai Productions Hawaiian activist East end resident
Uala Napolean	Hoʻolehua Homestead resident
Vicki Newberry	Head and founding partner of Akaʻula School Kaunakakai resident
Alberta K. Patchen	State of Hawaii Managed Work Force Development Volunteer with Na Puʻuwai Health Care system Kamalo resident
Annette Pauole-Ahakuelo	Facilitator at Molokaʻi Kūhaʻo Business Center Member of Molokaʻi Chamber of Commerce Kaunakakai resident

Name	Affiliation and Residence
Beverly Pauole-Moore	Member of Moloka'i Board of Realtors Members of Moloka'i Chamber of Commerce Member of Moloka'i Main Street Association Members of Moloka'i Filipino Association Kaunakakai resident
John Pele	Part owner of Maunaloa General Store Rooms manager at the Molokai Lodge and Beach Villas Board member of Moloka'i Enterprise Community Maunaloa resident
Christie Pentak	Secretary of West Moloka'i Association Former member of the Board of Directors of Ke Nani Kai (Kaluako'i condominium) Chair of Read to Me International (literacy program) Head of Athletics for Special Olympics Kaluako'i resident
Kuulei Perez	Kupuna with Native Hawaiian Education Member of Ho'olehua Homesteaders Association Part time Maunaloa resident
Julia Keli'ikuli Peter	Employee of gallery Ho'olehua resident
Maile Pidot	Kapuna of Maunaloa 'Ohana I Lōkāhi Assocation Maunaloa resident
Marlene Kamuela Purdy	President of Ho'olehua Homestead Association Operates family agriculture business Ho'olehua resident
Eliza "Aunty Kauila" Reyes	Member of Board of Directors of Aka'ula School Board Member of Ka'ahumanu Association Kupuna at Kaunakakai School Kalama'ula resident
Kalanilua Ritte	Co-founder of Hemowai Productions Ho'olehua Homestead resident
Walter Ritte	Administrator of Hawaiian Learning Center Ho'olehua resident

Name	Affiliation and Residence
Carl Brito	Airports Operations and Maintenance Supervisor, Maui District (Ho'olehua Airport), Airports Division, State Department of Transportation Kualapu'u resident
Moomoi Seasio	Fisherman Ho'olehua Homestead resident
Dr. Dan Shuman	Clinic Director and Family Physician Kaunakakai resident
Penelope Spiller	Retired State of Hawaii employee Ho'olehua resident
April Torres	Kawela resident
John Torres	Kawela resident
Elizabeth West	Employee of Maunaloa business Maunaloa resident
Captain Wren Westcoatt	Captain of Kaunakakai Fire Station
Sonya Yuen	Owner of Kualapu'u Market Kualapu'u resident

The following highlights characteristics of those interviewed:

- Place of residence

  Ho'olehua was home to the largest group of interviewees, at 26 percent. The second largest group comprised residents of Maunaloa / West End, at 20 percent, followed by Kaunakakai, at 19 percent.

- Length of residence

  Interviewees tended to have strong roots in Moloka'i. Over half of those interviewed were born and raised on Moloka'i. Regardless of whether they had left for school or other reason, those who were born on Moloka'i considered themselves born and raised on the island; 32 people established their Moloka'i roots at birth. Another four people described themselves as "long-time residents,' and another two lived on Moloka'i for more than 40 years. Twelve interviewees had lived on Moloka'i between ten and 30 years, and ten people lived on Moloka'i less than ten years. Information on length of residence was unknown for two people.

4.2. Comments about Relationship to Moloka'i and Moloka'i Style

4.2.1. Relationship to Moloka'i

In interviews, people were asked to describe their relationship to Moloka'i. They defined this relationship from several perspectives, the most common of which were home and family. The following summarizes their comments:

- Home

  Those interviewed typically consider Moloka'i their home in the most fundamental sense. It is their birthplace, their origin, the "soil in which my roots are planted." A common explanation of this relationship was "I was born here and will die here." It was felt that, regardless of whether one had moved away for school, marriage or employment, the island's welcome was always understood. Moloka'i was always safe haven and those interviewed knew that eventually they would move back.

  Interviewees who were born and raised on Moloka'i felt that being from Moloka'i is their #1 identity. More recent residents felt that moving to Moloka'i was "coming home."

- 'Ohana

  Another common type of relationship was family, and this relationship was described through several lenses:

  A place to raise a family: Moloka'i is safe place to raise children, and everyone looks out for each other's children. The rural and natural environments provide a rich learning ground, and there are fewer distractions that plague urban environments.

  My family's roots: Families are typically multi-generational, and ancestors can be traced and linked to various parts of the island.

  One big family: People are typically related to each other. They either had direct blood relationship, or were part of each other's extended family. Hānai relationships were common. The bottom line was that these family relationships transcended differing views, walks of life, politics, religious affiliations and other potential divisions.

  Kupuna and mother: Moloka'i is considered a kupuna and mother to her residents. She feeds, shelters and nurtures her people.

- Protective environment

  For those interviewed, their relationship with Moloka'i is also defined by a mutually protective environment. There is a sense of protection among the residents and between the people and the island. Interviewees noted that they would sacrifice for Moloka'i "without a second thought." One person described this relationship as a love affair; he has a responsibility to take care of and protect the island.

- A provider

  Interviewees appreciate a relationship with Moloka'i the provider. They feel that the island provides everything they need, including food, comfort, spiritual strength and stability.

- A destination that became home

  For more recent residents, Moloka'i is a destination that became home. They had moved to Moloka'i for employment or as a second home, and felt drawn to call the island home.

4.2.2. Moloka'i Style

Interviewees and participants in the public meeting and focus group sessions were asked to describe what is unique to Moloka'i. The term "Molokai Style" helps to define the social context for the Plan and the Project.

- Foundation of Hawaiian values

  Moloka'i is termed the last Hawaiian island, and people noted that the foundation for Moloka'i Style is Hawaiian culture and values. 'Ohana, mālama 'aina and aloha 'aina form the bases for the various facets of Moloka'i Style. As one person said, "We don't talk Hawaiian. We do Hawaiian. When there's a luau, we don't go to Safeway. We go to the ocean and the mountains." Building upon this Hawaiian foundation are the contributions of other cultures.

- Laid back

  A common attribute of Moloka'i Style is "laid back," which reflects both attitude and behavior. Being laid back was described as being patient and accepting. It means waiting patiently in your car when the driver in front of you stops in the middle of the road to chat with the driver of an oncoming car. It means keeping the speed limit and tolerating long lines at the gas station and in stores.

- Social interaction

  Also common was a clear pattern of social interaction. People noted that, not only did "everyone know each other," they also took care of each other. They talked about generosity and stopping to help someone with car trouble. People would find fruit on their doorstep with no note from the giver. Extra catch from fishing would be shared around the neighborhood. It was noted that even though there may be controversy and conflict, "when push comes to shove," people will help each other. Homelessness is virtually non-existent because people look out for those in need.

  Friendliness is best reflected in the tendency to wave as you pass other drivers "even if you don't know them."

  Moloka'i Style also means respecting and accepting each other. It was noted that newcomers are welcomed and families stick together even though they may be on different sides of an issue.

- Survival

  Moloka'i Style is a tradition of survival. People were comfortable, if not dependent, on outdoor living, and the island's natural resources provide for subsistence living. It is expected that people take only what they need to maintain sustainability.

  Survival also depends on maintaining good relationships with each other. People trust and depend on each other and bartering and trading are still practiced.

- Self-identity

  According to participants, Moloka'i Style means knowing who you are and your inherent value, and not depending on class or status for identification. Moloka'i Style is being comfortable with yourself regardless of your economic situation, and respecting others unconditionally. Hence, while those with low incomes should not be ashamed of being poor, the affluent should be satisfied with a modest house. As one person said, "When I was a child, we didn't know we were poor."

- Undesirable transitions and contradictions

  While Moloka'i Style meant mostly positive attributes, there were also some characteristics that were considered negative, and it was feared that these are becoming increasingly evident.

A common problem was the increasing antagonism associated with controversial matters. It was felt that Moloka'i is becoming known for its controversy and confrontation and that this is not reflective of the Friendly Isle.

Kūpuna noted they that did not teach people rudeness and name-calling and that this type of behavior is becoming more common at public meetings. It hurt them to see such behavior from their own Moloka'i people. They and others felt that this confrontational attitude is intimidating and causes a loss of aloha, respect and friendliness.

It was also felt that there is a continuing contradiction related to subsistence living. People said that while some pride themselves in their subsistence lifestyle, they are also willing to supplement their income with public assistance funds. That is not true subsistence but dependence on government.

Values and behavior that are not Moloka'i Style are those that disrupt or lessen the positive attributes. Hence, rudeness, impatience, road rage, pushiness and confrontation are considered counter to the laid back nature of Moloka'i Style. Further, conditions associated with urban settings, such as high density development, traffic congestion, social anonymity, high crime rate, homelessness, shopping centers and large box stores, are not Moloka'i Style. People stressed that they did not want to become like Maui, Oahu or Princeville on Kauai.

From a social perspective, being egocentric or selfish is not Moloka'i Style. It was also felt that excluding or insulting different ethnic groups is not Moloka'i Style, and neither is coming to Moloka'i with a "missionary attitude."

An important non-Moloka'i Style included values related to money. People objected to the attitude that everything is a commodity and has a price, that money can buy everything. This implies power for the affluent, and suggests that non-tangible assets, such as culture and values, are unimportant since they have no price tag. Money-related issues also extend to conspicuous consumption, whereby the affluent build expensive luxury homes, drive fancy cars and wear designer clothes. This emphasizes economic differences and creates schisms between haves and haves-not.

4.2.3. Hopes for the future

The most common hope for the future was that Moloka'i residents would improve their ability to survive on the island. It was noted that struggling should not be a requirement to living on Moloka'i. This hope extended to people who had left the island and would like to return; currently, they have few options. Survivability was linked to the following:

- A stable economy: It was noted that Moloka'i had not yet recovered from the plantation closures, and that island still needs economic opportunities that will provide a diversity of jobs, including management positions, and alternatives to the visitor industry.
- Improved education: People wanted to see the educational system help young people improve their skills and increase their knowledge so that they can make better choices and have more options.
- Decreased dependence on public assistance funds: It was noted that receiving government assistance is somewhat of a sub-culture on the island, and that this dependence is not a healthy condition.
- Improved public services: People hoped that on-island medical services would be expanded so that they did not need to travel to other islands for treatment, and that police and fire protection services and facilities would be upgraded. West end and DHHL homestead residents hoped that infrastructure improvements would be implemented as planned and expected. DHHL homestead resident hoped that their water system would be expanded and improved.

Another common hope related to the legacy for future generations.

- Resilient values: It was generally recognized that change is inevitable. Indeed, it was pointed out growth and decline are part of natural cycles in physical, social and economic environments. While people were willing to "keep up with the world" and incorporate modern improvements, they wanted to make sure that the positive aspects of Moloka'i Style prevailed. Hawaiian culture, strong family values and social respect and support must be passed down to future generations.

  It was also hoped that the Moloka'i community will be more unified in the future. The strong passion expressed in controversial projects is eroding some of the good parts of Moloka'i Style, and it was hoped that people learn to be more open and accepting of each other's views.

- Relationship to environment: An important component of the Moloka'i Style is a strong relationship with the environment. As discussed previously, people depend on their environment for sustenance, recreation and general well-being, and they are committed to protecting environmental resources.

  Passing on this legacy was very important. One person noted that "we have not inherited earth from our ancestors, but are borrowing it from our children," and others stressed that they wanted to make sure that their children and grandchildren have the same affinity for and relationship with the environment. Additionally, they wanted the environment to be even more abundant and accessible, thereby providing more food sources and other resources that can be shared by all.

  It was also felt that the environment should not be compromised in any way, even it means less jobs and economic opportunities.

An important part of hope for the future was growth and development, and there was strong consensus that growth needs to be planned, slow and controlled. Further, there was a sense of the "right type of growth." People wanted to make sure that new development would fit in. They were concerned that luxury housing would bring in millionaires, and generally assumed that these new residents would have values that conflict with Moloka'i Style. Further, there was concern that rich newcomers would have more power and would take control over future decisions.

Maunaloa residents hoped that their town would be revitalized. They remembered when the Maunaloa was a thriving community supporting many businesses and more activities. They pointed out that Maunaloa has too many empty houses, and that business is slow. They wanted to see their town regain its previous vitality, energy and liveliness.

4.3. Reactions to the Community Based Master Land Use Plan

Meeting participants and interviewees were asked to share their views on the Molokai Ranch Community Based Master Land Use Plan. People either liked the Plan because of what it contains, or disliked the Plan because of what it represents. The divergent reactions are hereby discussed.

4.3.1. Positive Characteristics of the Plan

People who approved of the Plan believed that it is a rare and unique opportunity. Given over three decades of conflicts between the community and Molokai Ranch, this Plan forges ahead with mutually beneficial results. Both people who were active in the formation of the Plan and non-participants felt that the Plan offers many benefits to the Moloka'i community and the following highlights these types of comments.

- Reliable basis for community expectations

  The Plan designates future uses for over 60,000 acres. People noted that this commitment to future uses provides a solid basis for what to expect on these lands. It was noted that the planning area comprises 110 census tracts, which raises the possibility of multiple landowners and thus different directions for future change. Consolidation of these properties in one overall Plan results in a collective set of changes in one source. The Plan is therefore a reliable source for community expectations for future uses and activities.

- Meaningful local control

  It was felt that the process for developing the Plan was open and inclusive, and the community had several opportunities to participate. The resulting Plan is the product of two years of meetings and many compromises. People felt that the Plan was truly the result of a local control in a community-based process.

  They noted that this local control will be extended through various components of the Plan. Most significant is the transfer of ownership of 26,200 acres to a Land Trust. These lands would be owned and managed by a local entity in perpetuity. Additional control would be achieved in Conservation-designated lands and other lands set aside for preservation purposes. Further, through the CDC, there would be local control in the development of affordable housing and community expansion. The Plan therefore promotes community-based self-governance of substantial assets.

  It was stressed that the implementation measures to carry out the land transfers and other transactions needs to ensure fairness and responsible stewardship.

- Significant conservation and preservation measures

  The people's relationship between environmental and cultural resources is core to Moloka'i Style. The Plan allows for preservation, protection and management of significant cultural features and valuable environmental resources.

- Protection and management of subsistence activities

  The Plan was considered consistent with community subsistence practices in that it allows access to areas that previously were off limits. Further, resource and activity management would be by local control via the Land Trust.

- Reopening of the Kaluako'i Hotel and upgrade of the Golf Course

  People associated the reopening of the hotel with positive economic activity. They felt that the reinstatement of hotel employment, coupled with visitor spending dollars throughout the community, would help stabilize the economy and increase personal income. Further, residents looked forward to revisiting a once popular local gathering place.

Those who liked the Plan felt it embodies Moloka'i style in several ways. It allows for local control over land and other resources. It helps people survive by providing economic opportunities and provisions for affordable housing. The Plan promotes subsistence gathering and ensures the protection and preservation of large tracts of land. This will protect these lands from further development in perpetuity, thereby maintaining the rural open space character of the West End.

4.3.2. Problems with the Plan

Those who did not like the plan had problems with what the Plan represents.

- Questionable process

  People were critical of the process undertaken to form the Plan. Those who oppose the plan said that the resulting Plan was very different from early discussions. They felt that much of the process was lip service and patronizing, and that "they were going to do what they were going to do anyway."

  Those involved in the ALDC process felt that their efforts and recommendations went unheeded. They cited the short time frame in which they were to produce their report, and felt that decisions were made without consideration of their input. One person's perspective of this situation was that the process employed manipulation, fear-based thinking and a hastened time frame.

  Also, some people had difficulty sustaining effort in attending numerous meetings over a long period of time.

- Undesirable carrot

  People who did not like the Plan expressed resentment over the Plan's relationship to the Project. They felt that the Plan is "being dangled like a carrot" so that the community will accept the Lā'au Point Project. They believed that the Plan's give backs were not worth the Project. They objected to the "either-or" choice as if choosing Lā'au would somehow solve the community's problems. One person likened the situation to the unsuccessful use of mongoose, which are nocturnal animals, to eradicate rats, which are diurnal. He felt that using Plan to justify the Project would cause more harm than good.

- Unnecessary and gratuitous effort

  The Plan was criticized for being unnecessary. It was noted that Moloka'i had successfully opposed other projects, and would continue to fight future undesirable projects. Hence, if Molokai Ranch were to sell the property to another developer who would propose development, they would fight the new owner anyway.

  It was also felt that the land to be gifted was "'ōpala land." The 1,600 acres that would be transferred to the Land Trust were described as "just a bunch of cliffs" and they placed little value on the rest of the land to be transferred. In the public meeting, people noted, "The land is ours anyway. We may have to play cat and mouse games, but we go there anyway."

People who object to the Plan believe it is not Moloka'i Style. They questioned the integrity of the process and felt that it did not embody social interaction that is characteristic of Moloka'i Style. They do not feel that the tradeoff is fair and therefore not Moloka'i Style. Moreover, they believed that the Plan will bring in outsiders with different values that would conflict with Moloka'i Style. These outsiders would have direct access and use of resources that people depend on and value for their cultural and spiritual attributes.

4.4. Reactions to the Lā'au Point Project

4.4.1. Full Support for the Project With or Without the Plan

Those who supported the Project unconditionally believed that it was the best option for the project site.

They believed that the Lā'au Point project is probably the least obtrusive of options for the site. The density is low, and there is a generous setback from the ocean. Cultural and archaeological resources would not be disturbed, and there will be shoreline access to a coast that has historically been off-limits to the majority of the population.

Further, development of the properties will yield economic opportunities. Construction related jobs will be generated by infrastructure improvements, lot preparation and house construction. There would also be ongoing jobs to fulfill the security, service and maintenance needs of new homeowners. It was expected that the cost benefit ratio would benefit the island. The property tax base would be increased, thereby increasing funding for schools and other public services and facilities. Yet, because the new residents would mostly be part-time, their use of these facilities would be intermittent and minimal.

Those who take this unconditional position note that, as the landowner, Molokai Ranch has a right to develop its property to yield reasonable profit. For them, this Project reflects a thoughtful and positive alternative in the use of the subject property. The Project is compatible with Moloka'i Style.

4.4.2. Conditional Acceptance of the Project and Support of Plan

Those who wholeheartedly approved of the Plan tended to accept the Project as a satisfactory trade-off. They believed that the Plan's long-term and far-reaching benefits outweigh potential negative Project impacts.

Acceptance of the Project is not always easy, however. The Project elicits mixed feelings, and this was a common tendency among Plan proponents. The Project requires significant change in an area that is virtually untouched. People value the pristine nature of Lā'au Point. Those who have fished or camped in this area cite the area's abundant resources and powerful mana. Ideally, for them, no change would come to Lā'au Point.

Nevertheless, they are willing to accept the Project because they understand that its implementation is the only way the Plan can be implemented. The Project will provide the springboard for Plan. These people envision a significant legacy through Plan implementation, one that will persevere through future generations. For them, because the Plan is Moloka'i Style, the Project is also Moloka'i Style because of its relationship to the Plan.

Local control over portions of the Lā'au Point Project is reassuring for those who have mixed feelings. The Land Trust will manage the shoreline conservation area in partnership with the new homeowners association. They will manage Kāmaka'ipō Gulch and oversee other significant resources in the Project site.

Further, it is felt that the low-density nature of the project, buffer zones and shoreline access features are positive features compared to higher density housing developments. The Project is also preferable to what has occurred on the East End, where change has been scattered, uncontrolled and subtle. With Lā'au Point, the community knows what will happen.

4.4.3. Opposition to the Project and Support for Plan

Support for the Plan did not always imply Project support. Those involved in the ALDC liked the Plan, but preferred that the Lā'au Point Project not be carried out for reasons incorporated in Section 4.4.4.

This group has recommended an alternative to the project. The ALDC supports "the purchase of the Lā'au Point property, in full or in part, by a "single" purchaser, meaning a third party, individual or entity." The purchaser should be motivated to preserve or conserve the property, including conservation development, or by educational uses. The purchaser may be motivated by tax incentives. [14] It was hoped that the new buyers would work with the Land Trust in its role in carrying out the Plan.

4.4.4. Opposition to the Project and the Plan

For those who do not like the Plan, the Project is the focus of their objection. While their objections have various facets, there are two recurring themes in their opposition.

[14] *Alternative to Lā'au Development Committee (ALDC), Memorandum to Ke 'Aupuni Lōkahi, Molokai EC, Board of Directors re: New West Land Company Report to the ALDC/EC and Next Steps, dated January 12, 2006.*

- Impacts on social environment

  People who oppose the Project are concerned that the impacts of 200 luxury homes on currently limited access property will have irrevocably negative social impacts. They feel it is unfair that millionaire newcomers will be able to live on a shoreline that has historical restricted access. They expect that the rich newcomers will come from neighborhoods that have pet leash laws and noise ordinances; the new residents will not appreciate local people fishing and hunting in their backyard. Eventually, it is expected that the newcomers will restrict such activities.

  Project opponents also believe that the millionaire newcomers will have a commodity-based value system that will clash with Moloka'i Style. The new residents will demand more services to suit the lifestyle to which they are accustomed. It was expected that the newcomers will demand expensive wine and gourmet food in the markets and restaurants.

  People who disagree with the Project fear that, because "money is power," the new residents will have powerful influence over local matters. All in all, it is feared that the newcomers will force local residents to live by imported values and outsider norms. To these people, the cumulative effects of change are that the Hawaiian culture and Moloka'i Style will be negatively impacted.

- Water application

  Project opponents strongly resent that Molokai Ranch is requesting an increase in non-potable water allocation to support the Project and other activities. The subject water source is in central Moloka'i where homestead lands are located. They perceive that the Project is taking DHHL water to support rich newcomers.

  Further, project opponents fear that there may not be enough water to support future local needs, much less the needs of rich newcomers. They do not believe aquifer and sustainable yield data from independent sources.

4.5. Suggestions from Meeting and Focus Group Participants and Interviewees

The last query was for suggestions, and participants in all venues responded. This section groups suggestions by topic, and every effort was made to capture the essence and tone of their input.

4.5.1. Suggestions on the Plan

Make sure the Land Trust has trustworthy and honest people.

Select credible and honest people for the Land Trust. Make sure they are from Moloka'i.

Bring in a few experts from outside to sit on the Land Trust. They could bring in broad experience and help the other trustees do their job.

Find a way to put water issues under Land Trust.

Continue to have a community-based process. This will be especially important when you set up the Land Trust and CDC.

Have a Maunaloa representative on the Land Trust.

Do the Land Trust and CDC. Don't ask us to choose Lā'au Point.

Give us something without asking for Lā'au.

Sell the property to the Moloka'i people.

Community needs to buy the ranch. If we own it, there would be no more trade offs.

If you want to make money, one that doesn't threaten existing lifestyle, find an alternative method of reaching your goals over longer period of time and in concert with community goals.

Find other ways to make money at Kaluako'i, such as an educational center or teaching resource (marine science, aquaculture, agriculture)

Get the hotel, restaurant and golf course running first.

Renovate the hotel, then we talk. Find alternatives for ranch lands (koa, macadamia nuts).

Build one more hotel, renovate the existing hotel, build two more condo projects, and add nine holes to the golf course.

Support the 15 acres designated for expansion of Maui Community College, Moloka'i campus. Expand the designated acreage for sale of property to be the same as the Moloka'i Community Plan.

Document the Plan in an enforceable legal document, preferably under government jurisdiction.

4.5.2. Suggestions on General Overall Project

Make sure the Project gets passed. We need the jobs and economic benefits.

Get going on the Project so that the Plan can go forward.

Let people know how the community can help move the Project forward. We need the Plan.

Make sure the Project gets approved. We need it.

Spread development over larger area that is integrated into different communities, rather than on one parcel.

Help us find a new buyer for Lā'au Point, one who would take care of the land and not develop it. This will help Molokai Ranch meet its financial objectives and protect the land from development.

Sell the Lā'au property to Bishop Estate. Let them come up with cultural theme that is more ecologically friendly.

There are other alternatives for the Lā'au site, such as a Hawaiian cultural tourism model. Give alternatives a real time frame.

Cancel the project. We don't want to be another Honolulu, Lahaina or LA. We want subsistence and self-sufficiency. We want sovereignty.

Don't do Lā'au; it isn't needed.

4.5.3. Suggestions on Specific Project Components or Effects

Preserve the human relationship with the fishing grounds. Put in a fence between the makai boundaries of the houselots and the shoreline. Plus, make sure new residents must also go through the resource management program.

Don't develop the shoreline. Move inland.

Move housing more mauka. Increase the buffer zone between the ocean and houses.

Increase shoreline access points.

Make sure that the resource management team is effective and follows whatever rules are set up.

The resource management team needs to be from this ahupua'a. We have been taking care of this land for generations.

Need to set up a good educational program. Start with a pilot program that addresses ocean and shoreline conservation practices.

Enforcement in conservation areas need to start in the very the beginning. Don't let people cut corners.

Need a spiritual component. Make sure kūpuna provide spiritual guidance are provided throughout the process. Get kūpuna from the West End, one that is from the ahupua'a and knows the land, not one from the other side or another island.

Help to educate visitors and new residents so the can feel welcomed and not be afraid to interact. Mutual respect is important.

Show new Lā'au Point residents how to participate in local efforts.

Do not create a gated community.

Re-route the Project access route through Maunaloa town. This will establish a connection between new and local residents, and support the town's businesses.

Don't put a road through Maunaloa town.

Don't bring the road through Pāpōhaku.

Put in walking paths along new roads.

Fix existing infrastructure.

Expand infrastructure to existing Pāpōhaku and Kaluako'i residents (electricity, water, telephone, cable).

Upgrade the infrastructure in the West end. This should include improvements to water, telephone, cable, DSL and electricity systems.

A parcel of land has been designated to house a fire station near Kaluako'i. MPL and its partners should commit to building a fire station as part of the overall plan**.** The facility could then be transferred to the control of Maui County.

Put land aside for water desalination.

Keep police and fire departments informed of the Project's progress so we can prepare.

Put in affordable housing.

4.5.4. Other Suggestions

We need to change our attitudes and not be selfish. We need to share our water.

Think about locals before you accommodate newcomers.

Keep up a good process.

Be open with the community. Don't hide information even if it's not favorable to the ranch. Trust us.

Get people involved. Openly communicate. Don't be afraid or ashamed.

We need to get more open-minded people to the meetings – enough fighting.

Have more informal meetings like the focus groups so people like us can learn more about the Project. We do not want to go to public meetings. Too intimidating. The newspapers are biased.

We've worked so hard to get this far. Let's not start over.

Develop affordable housing by Moloka'i standards, not Maui standards.

Don't give us a myth that there is water. There is one land. Prove that there is more than one aquifer.

Don't impact water supply. Respect the Hawaiians.

Take care of your employees. You have good people.

4.6. Analysis

Despite the wide range of opinions and concerns about the Plan and the Lā'au Point Project, this analysis finds significant commonalities. First, there is a consensus on Moloka'i Style. People share the Moloka'i identity and relate to each other through a common understanding of Moloka'i values and behavior.

Second, people are passionate about Moloka'i. Living on Moloka'i is an intentional choice. People are committed to their relationship with the island. Those who left for awhile have been drawn to return. They seek the return of their children so that they too can enjoy strong relationships with the island and her people. More recent residents made a conscious decision to live here and fit into the social fabric.

People are equally passionate about protecting their island and perpetuating the Moloka'i Style. Regardless of their position on the Project or Plan, people want to protect Moloka'i from detrimental change. The controversy stems from a divergence in the approach on *how* to protect and perpetuate.

For proponents of the Plan, their approach to protecting Moloka'i is to be proactive in determining the island's destiny. The lack of control due to landownership and land use issues implies an unknown future and possible proposals that could threaten the island, its people and its resources. They have chosen to solve this problem by coming up with a Plan that brings more community control over land resources through land ownership, resource management and land use controls.

To them, the Project is part of this larger scenario because it is a necessary springboard for the Plan. In this scenario, the Project is part of the solution.

For others, however, the Project is the heart of the problem and not a solution. They focus on Lā'au Point because to them it signifies a threat to the people, the environment, the Hawaiian culture and Moloka'i Style. Their approach to solving the problem is to fight its approval and implementation. Indeed, there have been strong public statements by project opponents that they will do whatever it takes to stop the Project.

Activism is not new to Moloka'i. Proposed development projects are typically met with scrutiny and skepticism. Moloka'i residents are experienced in taking a stand and opposing efforts they disapprove. Recently, the proposal to allow cruise ships to land in Moloka'i was defeated, and the University of Hawaii withdrew its patent applications for genetically-modified taro when Moloka'i activists protested. Proponents of the Plan and Project participated in these efforts.

The uniqueness of this situation is the relationship between a specific development proposal and a plan that extends far beyond project boundaries. While Lā'au Point Project opponents are putting up signs and organizing protests, Plan proponents are exploring mechanisms for coming up with a resource management program and establishing a Land Trust and a Community Development Corporation. Hence, while both sides are seeking to protect Moloka'i, their strategies have no commonality. There is little that can be done to bridge the gap.

For those who are not strongly aligned with either side, and this is likely a large part of the community, the prominent issue is the Lā'au Point Project. They are accustomed to activist efforts, and Lā'au Point is no exception. In interviews and three of the four focus group sessions, people were very aware of the Project and less knowledgeable about the Plan. It was easier for them to address the Project than to discuss the Plan.

Based on our issues analysis, we believe that the uncommitted residents of Moloka'i share the same values of Moloka'i Style and have the same passion and commitment to protect the island. It is to their advantage to know about the Plan and the Project so that they understand the full implication of both. Many of those we interacted with in this study indicated that they will not attend public meetings because they dislike the antagonism and conflict. To help them make an informed decision, every effort should be made to share information with them in a non confrontational environment that encourages constructive dialogue.

5. Potential Social Impacts

An overview of impact analysis is presented in Section 5.1. Section 5.2 identifies population impacts and Section 5.3 discusses the Project's relationship to public and community plans. Section 5.4 presents the Project's impact on the social environment and potential impacts on public services and facilities are identified in Section 5.5.

5.1. Overview of Impact Analysis in this Report

5.1.1. Direct and Indirect Impacts

Because of the relationship between the Project and the Plan, the Project's implementation, or its non-implementation, will have a direct effect on the Plan. Further, it has an indirect relationship with Plan components. Where appropriate, a discussion of the Project's effect on the Plan is provided to understand the full social context of social impacts.

For the purposes of this analysis, two levels of impact are identified. Direct impacts are those that specifically result from Project implementation. These include, for example, population increase, and increase in demand for public services resulting from the new population.

Indirect impacts are the Project's effect on the Plan. A secondary impact, for example, is the Project's enabling of the formation of the CDC and the Land Trust, as well as the reopening of the Kaluako'i Hotel.

5.1.2. The No-Project Scenario

In our social impact assessments, the No-Project scenario typically signifies the absence of a projected impact. Hence, the project need (e.g. affordable housing, infrastructure improvements, housing demand) would not be met, and direct and indirect impacts would not occur.

In this analysis, the No-Project scenario has a significant effect on the Plan. Since the Project is the only springboard for the Plan, the Project's non-implementation means that most of the Plan will not be realized. The only Plan component that will occur without the Project is the gifting of 1,600 acres to the Land Use Trust. All other Plan components would likely not be implemented.

Further, the principal issue of the No-Project scenario is the viability of ongoing operations of Molokai Ranch and its employees. The net loss from operations between 2002 and 2006 was approximately $31.6 million. Cost cutting measures reduced operating losses from $8.6 million in 2001 to a range of $3.6 to $3.8 million in the past three years. In addition to operating losses, annual capital expenditures annually average over $800,000 million. In total, the MPL subsidy of operations and upkeep average between $4.7 to $10.2 million annually. The cumulative subsidy in the last five years is $36.9 million.

If the Project is not implemented, it is therefore highly likely that MPL will need to seek other options summarized as follows:

- Sale of other land inventory: MPL has 101 lots that could be sold exclusive of inventory in Pāpōhaku Ranchlands, Maunaloa and the Industrial Park. In addition, the agricultural lots in the West End could legally be subdivided into more than 1,500 lots; this does not include the parcels held outside the Kaluako'i ahupua'a. It is unlikely that a single buyer would acquire all these holdings, and highly likely that multiple buyers would be involved.

- Further reduction in operations: Without increased support for the hotel and golf course operations that would result from the Project, MPL options include further operational reductions and possible closures. In addition, MPL would likely be forced to reduce or eliminate other subsidized operations such as maintenance, nursery, gas station and other services.

  With these reductions would come possible termination of ranch operations and land banks. Employment could be reduced by over 100 jobs to ten full time positions.

  These measures would result in lost tourist expenditures and severely affect local businesses throughout Moloka'i. [15]

As appropriate, the No-Project scenario is incorporated in this impact analysis.

5.2. Population Impacts

The population characteristics of the proposed Project are based on the marketing objectives and program, which are included in the economic analysis in the EIS. [16]

[15] *Knowledge Based Consulting Group, Economic and Fiscal Impacts of the Proposed* ***Lā'au Point Residences on Moloka'i (June 2006),*** *page 16.*

The Project features low density oceanfront and near shoreline lots in a setting of undeveloped seclusion and natural beauty. It is considered a unique project and expected to attract buyers who seek privacy and the natural setting, and appreciate the Moloka'i community. These buyers are distinguished from those who would be attracted to the resort environment of other islands.

Lots will be an average of two acres. Lot prices will range from approximately $1.48 million on the western shoreline section to an average of $650,000 on inland lots. The overall average lot price is estimated at $970,952.

The residential market values are projected at $34.4 million in 2008, which is the first year of lot sales, and increase to $211.9 million in 2012, when the lots are sold and the initial homes are built. As additional homes are built, residential values are projected to increase annually by an approximate $16 million, and at the projected build-out in 2023, the residential market value is estimated at $352 million.

The average size of the residential units is 3,500 square feet. It is anticipated that the building footprint will cover between three and eleven percent of the lot.

The time frame for the Project calls for the development and sale of the proposed 200 lots over a five-year period beginning in 2007. Construction of initial houses should begin in 2010 and is expected to continue through 2023.

Lā'au Point buyers are typically expected to be in their pre-retirement or retirement years with very few or no school-aged children. In terms of housing occupancy rates, Lā'au Point is projected to follow resort community occupancy patterns, whereby less than 20 percent of the units are occupied full time and the average overall occupancy is less than 30 percent.

Table 15 summarizes Project population estimates.

[16] *Knowledge Based Consulting Group,* ***Economic and Fiscal Impacts of the Proposed Lā'au Point Residences on Molokai*** *(April 2006).*

Table 15: Project Population Estimates

Average household size *	2.90 persons
Estimated permanent population in 2012 (end of lot sales period) **	12 persons
Estimated permanent population in 2023 (final build-out)	174 persons
Estimated seasonal population during peak seasons ***	325 persons
Estimated peak population of permanent and seasonal residents	499 persons
Average on-site combined population of permanent and seasonal residents	230 persons

* *Includes possible caregiver*

** *Permanent residence is defined as living in the unit at least 6 months in a year.*

*** *Up to 80 percent of seasonal residences may be occupied during peak seasons.*

Source: Knowledge Based Consulting Group, ***Economic and Fiscal Impacts of the Proposed Lā'au Point Residences on Moloka'I*** *(June 2006).*

In terms of numbers, the Project population at build-out will account for a very small portion of the County population forecasted for Moloka'i in 2025. The permanent population will account for two percent of the forecasted 8,068 persons in 2025. During peak seasons, the on-site population will account for six percent of the island population, and, on the average, Lā'au Point residents will make up three percent of the island population. The Project population will be well within the population forecast for Moloka'i and will therefore have an insignificant impact on population counts.

For comparison purposes, another development effort proposed for Moloka'i is the increase of DHHL residential lots. The MIP identifies the development 361 lots or units as a priority. Assuming that these units would be developed by 2025, and based on the County-generated socio-economic forecast for Moloka'i, the new DHHL units could house an estimated population of 1,018 persons. [17] Residents at this new DHHL residential development would account for 13 percent of the forecasted population for 2025.

[17] *Based on ratio of projected population to projected households, which is 2.82 persons.*

In terms of relationship to the Plan, the Project would allow the Plan to move forward with affordable housing and community development. The Plan calls for provisions of both land and financial resources. The affordable housing component would generate population impacts, the extent of which is unknown at this time. The CDC would need to evaluate impacts in its efforts to develop the affordable housing, and submit necessary studies to support its applications for those development projects.

5.3. Relationship to Public and Community Plans

Section 3.1 presents public policies that guide the future direction of Moloka'i. These policies embody community values and provide a basis for community expectations for the social environment.

The Maui County General Plan identifies county-wide themes, and the Project is consistent as follows:

- Agricultural and rural identity: The Project contains provisions intended to protect the rural identity. The Project is directly consistent with this theme in that the bulk of the Project site would remain undeveloped, and therefore retain a rural character. Indirectly, the Project would act as a catalyst for the Plan, which calls for the protection of 55,000 acres in perpetuity.

- County shoreline and visitor industry growth: The Project includes the expansion of the shoreline conservation area, and is therefore directly consistent with the theme of shoreline protection. The Plan is also consistent with this theme in that, while it includes provisions to re-open the Kaluako'i Hotel, it puts a cap on further development of visitor units. Part of the property that is zoned for resort use would be conveyed to the Land Trust and further development would be prohibited.

- Economy: The Project supports this theme in that revenues from its implementation would be used to upgrade the Kaluako'i Hotel. This action would generate short and long term employment and therefore help to support a viable economy.

- Resident housing: The Project supports this theme in that it would lead to the formation of the CDC that would in turn develop affordable housing.

The Project requires revision to the Land Use Map in the Moloka'i Community Plan for portions of the development. It is relevant to several goals advocated by the Moloka'i Community Plan, as follows:

- Land use: The Project is consistent with the goal of providing future generations with the opportunity to experience rural and traditional lifestyle. Its implementation will lead to the protection of 55,000 acres from development and formation of the Land Trust to own and manage these lands for future generations.

- Subsistence: The Project is consistent with the goal to promote the continued practice of subsistence. Project plans include the expansion of shoreline conservation lands that would be available for subsistence practices. These lands would be managed by a local Land Trust. In addition, Project implementation would lead to the protection of 55,000 acres that would be managed by the Land Trust. Subsistence activities would be an integral part of its management program.

- Environment and cultural resources: The Project supports goals intended to preserve, protect, manage and enhance environmental and cultural resources. Within Project boundaries, the conservation area would be expanded and be placed under the ownership and management of the Land Trust. Further, Kāmaka'ipō Gulch and other cultural resources will be part of the Land Trust's responsibility. The Project also supports these goals in that it will make possible Plan components that lead to the protection and management of 55,000 acres for preservation purposes.

- Economic activity: The Project is consistent with the goal for a preferred, viable and sustainable economy that is in balance with resident needs and values, cultural and natural resources and lifestyle. Proceeds from Plan implementation will support the reopening of the Kaluako'i Hotel, an action that was strongly supported in the development of the Plan.

- Housing: Project implementation will allow the transfer of land and financial resources to the CDC for the development of affordable housing. It is therefore consistent with the goal to provide housing opportunities that are affordable and culturally compatible.

Section 3.2 presents the Ten-Year Community Strategic Plan prepared by the EC in collaboration with the community. The Project is highly consistent with this plan in that it is the result of the EC's strategy to create compatible development strategies as part of the Community Based Master Land Use Plan. Further, the Project enables the formation of a Community Land Trust, a strategy intended to make the vision a reality.

In summary, the Project is consistent with public and community plans that guide the future of Moloka'i. The Project serves as a catalyst to carry out the community policies and goals embodied in the Molokai Ranch Community Based Master Land Use Plan. Hence, the Lā'au Point Project has a significantly positive relationship with public and community plans.

5.4. Impacts on the Social Environment

The fabric of the social environment is woven by relationships. The threads of this fabric are interpersonal relationships, relationships to the environment, to the culture, to the past and future, to the global community, to the neighborhood.

The Moloka'i social environment is a colorfully rich textured fabric. Those of Moloka'i readily recognize it, and others see its uniqueness. In Section 4, the identity of Moloka'i Style was found to be common and prevalent. While this social environment has proven resilient over time, it was also considered fragile and vulnerable. The desire to protect this social environment was widespread and often passionate.

This analysis explores how the Lā'au Point Project fits into this social environment. Will it blend into the existing pattern, or will it change the design? Will it add to the richness, or will it detract from its beauty?

The following sections present two models for growth, explore how they relate to the Project, and examine the Project's social impacts.

5.4.1. Two Models

Two models of growth in Hawaii were analyzed to understand how they might apply to the Lā'au Point Project. In our study, both Lanai and West Maui were cited as examples of what people did not want to see in Moloka'i. Recent rapid change in Lāna'i has resulted in major transformation in the social environment and related problems. Lāna'i development is therefore presented as a model of rapid, significant change. West Maui has experienced significant population growth over a thirty-year period. It is included in this analysis because of the population increase due to in-migration and the shift in settlement patterns.

Lāna'i Development – Rapid Economic Shift and Social Problems

The Lāna'i community had been a stable community of 2,700. Residents lived a rural plantation lifestyle for many years. Since 1920, Lāna'i's one-crop economy was built solely on the primary production of pineapple. In 1985, California-based Flexi-van Corporation merged with the island's existing landowner Castle & Cooke and assumed 98 percent of the island. Plans to phase out pineapple and develop tourism were subsequently announced.

Agriculture was phased out and the first resort was opened in 1988, followed by a second in 1990. The rapid development of a tourism based economy, with the development of Koele Lodge and Manele Bay Hotel and golf courses, marked a shift away from agribusiness for the entire island. In addition, the development includes a 375-acre luxury residential development.

The longitudinal social impacts and mental health aspects of this change were studied over a five year period from 1989 to 1993. [18]

The resort development phase necessitated the influx of construction workers from other locations. Local residents underwent extensive training for resort positions that would require radically new interactive skills and knowledge for the upscale resort. The population increase and interactive difficulties between newcomers and residents was just the first shock to the very cohesive agricultural and agrarian, multiethnic community. In 1989, drug and alcohol use attributed to construction worker influx was reported. Marital difficulties and divorce increased as more personal and social options became available to women in unstable relationships. Psychological and family problems increased as the resorts neared completion in1991.

As Dole Co. attempted to gain permits for luxury resort homes and golf courses, resistance was mounted by Lanaians for Sensible Growth (LSG) and the ILWU leaders to slow or alter the development progress. Some felt that the plans would create a two-tiered society - the rich and the working poor. The luxury homes met with resistance as residents felt the negative social and cultural impacts out weighed the Company's desire for profits.

As the researchers observed, some cultural infusion can broaden the cultural base of a community but often the new values clash with the traditional ones, thereby upsetting the social fabric as drastic demographic and ecological shifts have been shown to affect other Hawaiian communities.

For those residents having strongly felt community cohesion, the faster, unfamiliar pace and new faces were threatening. Recreation areas were taken over by visitors and new workers from the mainland. Researchers were faced with uncovering the depth and breadth of these overt and covert feelings, social and psychological impacts. The qualitative reports of residents were evaluated through guided discussion and focus groups. Issues included the following:

[18] *Jon K. Matsuoka, PhD.,* ***Economic Change and Mental Health on Lana'i: A Longitudinal Analysis*** *(1997).*

- Families were changing - Awareness that less structured work schedules was affecting time spent with family and in recreating activities, hunting and fishing.
- Loss of community cohesion – Past plantation working hours afforded time spent supporting others and in group and calendrical cultural activities. Families were becoming more self-centered.
- Increased crime – The youth, spending more time with peers and less unsupervised time with parents, was committing petty, property theft.
- Increased stress - Long-time residents were less adaptive than newcomers to rapid economic changes and working in up-scale environment under demanding supervisors.
- Company controls – The economic changes were forced on them by the company.
- Company broke promises in the past – Newcomers hold most of the higher supervisory positions that residents had trained for and been promised.
- Growing job insecurity – Financial losses at the resorts forced layoffs. The Company used layoffs as leverage to gain support for luxury home developments. Many workers had mortgages in new affordable homes.
- Greater disparity between rich and working poor – Wealthy tourists become new residents in luxury home communities.
- Development leads to changing behaviors/values – The new economy afforded purchasing new items. Children were given money by parents and became more materialistic.
- Big chain stores could wipe out local businesses – The 27 small business owners feared that wealthy new residents' consumer demands would displace them or cut off the trickle down financial benefits they had anticipated. As it turned out, few experienced business benefits from newcomers, the resorts had their own services and gift shops.
- Development brought loss of local culture – Acculturation to new lifestyles and pace decreased family values and cultural institutions. Loss of culturally esteemed values of collectivity, support and respect for elders were diminishing.
- Out-migration of youth/no jobs – Youth employment during the summer months at plantation jobs had given them a common bonding experience, increasing community cohesion. Many forced to leave the island because of layoffs at the resorts.

- Concerns about water supply – Some felt that the aquifer should not be depleted; careless watering of the golf course with potable water would cause problems in event of a drought.

- Overcrowding of beaches – Residents felt the presence of newcomers occupying favorite recreation areas. Youth and fishermen were sensitive to this.

- Race problems between haole and locals – There were rank, class differences in jobs with Caucasians holding more supervisory/ managerial positions.[19]

Some social impacts had generational, age, class and cultural implications. For example, those older, long-term residents with strong sentiments for community cohesion were affected most by rapid change, seen as threatening and most stressful. Feelings of disrupted community cohesion brought on by shift work and holding multiple jobs for job instability, placed more stress on the nuclear family. Community cohesion was also reduced by limited discretionary time available for traditional institutions (church activities) and voluntarism in community projects. Work place adaptations to mainland supervisors, differences in socially acceptable behaviors and interactions, and cultural misinterpretations interacting with authoritarian superiors and resort guests caused mental health problems. In contrast, the Caucasian newcomers and repatriated Lanaians holding better jobs were optimistic, with new opportunities, and having left problems behind.

The most striking negative adaptation to economic change was the increase in crime. Assaults, vandalism, theft of property, disorderly conduct, and so on, increased remarkably in the period of 1991 to 1995. The influx of non-local, wealthy newcomers evidently created a "have and have not "scenario of resentment. Young residents and fisherman also resented the presence to newcomers "taking over" favorite beaches, polluting them, and having amenities built to serve the newcomers. Overcrowding was disruptive and fishermen had to compete with tour boats and snorkelers.

[19] *Ibid, pages 76 to 83.*

The study concluded that, given the problems resulting from the rapid and monolithic social change, it might be more worthy and cost-effective to encourage prevention of these problems through the sustainability of traditional lifeways than through human service interventions. Human service response to social fall-out is a requisite measure, but cannot compensate for what is lost in the way of family and community process. The qualities imparted to individuals from healthy families and communities reflect the sanctity of these institution; they cannot be replicated.

West Maui – Significant In-Migration and Shift in Settlement Patterns

West Maui's main settlement areas include the former whaling town of Lahaina, which has most of West Maui's permanent residents, and the coastal resort expanse stretching north from Kā'anapali to Kapalua. Kā'anapali has been planned and marketed as an integrated unit since the early 1960s. Complementing the resort area along the shoreline are planned residential communities mauka of the main highway. The newer developments around Kapalua have followed a similar strategy of master planning. Interspersed with the major resorts are pockets of older residential neighborhoods and villages.

During the heyday of West Maui's sugar industry early this century, camps for the workers of Maui Land and Pineapple and the Pioneer Mill dotted the region. The plantation camps dwindled and ultimately disappeared as employment in the West Maui sugar industry dwindled.

With the development of Kā'anapali, West Maui experienced major economic revival, and as the region's visitor industry grew throughout the 1970s and 1980s, the population mix significantly changed. Labor shortages in the booming visitor and construction industries attracted young workers, especially from the continental U.S., to the area. Retirees and investors also moved into the area and purchased upscale homes, often vacation units in planned communities developed around the Kā'anapali and Kapalua golf courses.

Between 1970 and 2000, West Maui's population more than tripled, subdivisions replaced agricultural fields, and hotels and condos fronted the shoreline. Also, settlement patterns shifted. Almost three-fourths of the West Maui population resided in and around Lahaina in 1990. Ten years later, almost half the population lived in the Kā'anapali – Kapalua region.

Earthplan conducted two social impact assessments on Kā'anapali projects. The first study was on a timeshare resort on the 96-acre at North Beach. [20] The second study was conducted six years later on the Kā'anapali 2020 Plan. [21] Kā'anapali 2020 was a master planning effort that incorporated the principles of Smart Growth, New Urbanism and alternative modes of transportation aiming to create livable communities where people can live. The planning area covered 4,325 acres. Proposed uses were intended to be consistent with town development and included residences, employment centers, a hospital and other community uses. Kā'anapali 2020 entailed a lengthy and intensive community participation program.

In both studies, community interviewees were asked to describe the region's strengths and problems. Community strengths were similar in both. They included the social environment, including the diversity of people, the beauty of the natural environment, and the cultural and historical legacy. Community problems in both studies tended to be related to regional growth, and these included:

- Public Infrastructure: Traffic congestion and the lack of an efficient transportation system were the direct result of increased resident and visitor population. Parks were overused and improvements to sewerage and drainage systems were not keeping up with new development.

- Affordable Housing: The lack of affordable housing was a big problem. The region's rental unit supply is dominated by short term, high-priced rentals targeting tourists. Many of the region's employees cannot afford to live in West Maui, and must therefore commute from other parts of the island.

- Social Problems: In the second study, some people felt that the relationship between newcomers and long-time residents had improved. Still, there was continuing animosity based on financial disparity. It was pointed out the many of the relatively new residents (ten years and less) live in the higher-priced and gated Kā'anapali and Kapalua communities. It was felt that it was difficult for some workers to witness the conspicuous economic differences while they have difficulty with economic survival. Also, it was felt that newcomers tend to be more articulate, and some eventually assume leadership roles in community organizations and efforts. While this was considered a positive contribution, it was sometimes considered negative when the

[20] *Earthplan,* ***Kaanapali Vacation Club: Social Impact Assessment*** *(February 1997).*

[21] *Earthplan,* ***Kaanapali 2020: Social Impact Assessment*** *(August 2003).*

newcomers try to impose their own culture and experience on the existing community. Crime and drugs were a continuing concern.

Although there was continued concern about social problems generated by an influx of newcomers and visitors, there was a difference in attitude between the two studies. In the second study, community informants felt that there was more community cohesion. As the newer residents settled in, people were accepting the differences in viewpoints and cultures. The newer residents were contributing to local efforts, and the respect between long-time and recent residents was reportedly growing.

Further, there was optimism about the future in the second study. Many of the interviewees participated in the Kā'anapali 2020 effort. They felt that they were able to work together and compromise, and that the plan was a reflection of a preferred future for West Maui.

5.4.2. Relevance to Lā'au Point

The Lāna'i model illustrates how a rapid shift from a single-product agribusiness to resort and luxury development caused significant social disruption. While other communities with plantation closures have options of diversification or relocation to nearby employment centers, the Lāna'i community was only offered the option of upscale resort development and accompanying resort service jobs. Long-term residents were forced to adapt to the new economy. Faced with the specter of unemployment, they supported the economic change and job opportunities of resort development, but with some skepticism.

The problems related to lack of options are directly to lack of community control. Lāna'i residents were not afforded to opportunity to have meaningful input in the future of their island. Economic disparity and racial tension exacerbated feelings of helplessness and social stress.

In meetings and interviews on the Lā'au Point Project, people who opposed the project feared the Moloka'i would follow this Lāna'i model if the Project were implemented. They felt that residents would be subject to the control of the rich newcomers. They were concerned that their lifestyle would be irrevocably diminished by the presence of millionaires who would flaunt their wealth and disrespect local values.

Two factors suggest that Project implementation would not result in social conditions that exist on Lāna'i.

- Community control: Whereas Lāna'i residents historically accepted the conditions of the island's predominant employer, Moloka'i has traditionally exhibited self-reliance and independence. Changes and proposals are scrutinized, and residents make their own options if they

do not like what is presented. Community control was a salient factor in the development of the Plan and Project.

- Multiple forces for change: Lāna'i was given only one option to change. Moloka'i has multiple options. The economic base is more diversified than that of Lāna'i, and people have more choices than just the visitor industry.

The social problems present on Lāna'i could occur anywhere, however, as long as long as people feel an absence of choice and loss of control due to development. The lesson to be learned from Lāna'i is how to prevent such social problems. The Lāna'i study encourages the prevention of these problems through the sustainability of traditional values and practices. Rather than replacing existing values with imported standards, new development should build upon the traditions that existed prior to the change.

To those who participated in this SIA, West Maui is an urban environment characterized by too many structures, too many people, too many newcomers, and too much development. This was highly undesirable, and it was felt that any step in this direction would be detrimental to Moloka'i. For those who oppose Lā'au Point, this Project is a step in that direction.

Development has indeed significantly altered West Maui's social environment. The social impacts of development in West Maui have generated significant changes. The increase in population and shift in settlement patterns are measurable impacts. Changes in the political and social structure are less tangible but no less significant.

Two factors suggest that the replication of West Maui's social environment in Moloka'i due to the Lā'au Point Project is highly unlikely.

- Significant difference in timing and scale: Lā'au Point Project build-out is estimated to take 16 years. At the end of this period, an estimated 174 people will be permanent residents. This will account for only two percent of the population forecasted for 2025. The likelihood of these people having significant influence in changing Moloka'i's social and political structure is low.

- Protection of land from future development: If the Project is implemented, over 55,000 acres will be protected from development. This will prevent a change in settlement patterns on subject lands.

Nevertheless, the West Maui model can serve as example for relationships between long-time residents and newcomers. While there are still differences in values and lifestyle, community cohesion in West Maui was growing. Long-time residents have come to appreciate the contributions of more recent residents, and the latter have learned to work within the framework of the local community.

5.4.3. Lā'au Point Project Impacts

The impacts of the Project on the social environment are based on the number and type of new residents. It is estimated that 174 permanent residents will live at Lā'au Point, and that peak occupancy would have 499 residents on-site. The average number of permanent and seasonal residents is 230.

The new residents are expected to share common socio-economic characteristics, the most notable of which is high income. Lā'au Point residents are expected to be empty nesters and in pre-retirement or retirement age. Further, most of them are expected to be based elsewhere, and will live at Lā'au Point on a part-time or seasonal basis.

Expectations of conflicting values and unfair treatment

The impacts of this new community are related to expectations and preconceptions of other social groups. There is a tendency to expect certain behavior and values of people who are different. Race and gender have culturally and historically been the bases for expectations. Economic class differences also elicit preconceptions, as do age, religion, politics, occupation and lifestyle. The bases for these expectations vary, including cultural mores, the media, experience, parents, authority, and so on.

It is therefore typical to expect that Lā'au Point residents will have values and behavior that are different if not counter to Moloka'i Style. Part of the Project's impact on Moloka'i's social environment is therefore the sheer expectation of conflicting behavior and values. These expectations create an atmosphere that awaits conflicts, and an atmosphere of tension and apprehension.

This impact on the social environment is already occurring. In meetings and interviews for this study, we found that people have many expectations of the new residents, and these expectations are especially negative for those who oppose the Project. People expect the new residents to have materialistic values and to look down on those who are poor. They expect the new residents to be haole, and to have stereotypical characteristics of that ethnic group. People expect the new residents to have little or no appreciation for Moloka'i Style, including social behavior, subsistence gathering and ocean recreation.

Further, Project opponents publicize these expectations, and these visible and vocal expectations can influence those who are neutral about the Project.

Community conflict

The Project has elicited passionate community discourse. Project opponents especially have vocalized their strong objection to the Lā'au Point project. In interviews and meetings for this study, opponents have vowed to use aggressive measures to fight the project in legal and public arenas. Bumper stickers and signs are reminders of their position, and members of the Save Lā'au group, Hui Ho'opakele, are planning to occupy the Lā'au area. [22]

This contentious public debate affects the social environment because it breeds apprehension and social disharmony.

Social interactions and relationships

Another impact on the social environment is related to future social interactions and relationships between existing and new residents. These interactions can be positive or negative.

- Interactions at Lā'au Point

  The Project will open up Lā'au Point to the community, and existing and new residents will interact. These interactions are especially sensitive because Lā'au Point is "our 'aina" to existing residents and home to the new residents. Interactions can be positive if both parties are respectful and appreciate each other's privacy and right to enjoy Lā'au Point. The interactions are inevitably negative if either party displays possessiveness or disrespect for the other's relationship to this area.

- Interactions in community efforts

  Community efforts provide opportunities for positive interactions because both existing and new residents can work toward a common goal. Encouragement and appreciation for each other's contributions go a long way in creating positive interactions. If newcomers insist on his or her way, or places higher value on "where I come from," or existing residents exclude newcomers, then interactions become negative and counter-productive.

[22] *Bree Ullman, Linda Lingle Endorses Master Plan; Criticizes Lā'au Opposition,* ***Moloka'i Dispatch*** *(August 18, 2006).*

- Casual interactions

  Casual interactions in stores, churches, schools, banks and other public places are the most common and impressionable. In discussing Moloka'i Style, people often referred to their experiences in these venues. Friendliness and common courtesy between casual acquaintances plant the seeds for positive interactions. Impatience and rudeness will leave a negative impression that may extend to future interactions.

Community experience at Lā'au Point

In addition to personal interactions at Lā'au Point, the social environment of existing residents also includes the actual experience of visiting the area. Although study participants generally did not frequent this area, they knew of and appreciated its mana. The seclusion and pristine nature, along with abundance of food sources, make this a very special place for Moloka'i residents. It is part of Moloka'i Style.

Having luxury homes and affluent residents would alter this experience, particularly if the homes and property fences are very visible or prominent. The juxtaposition of natural beauty and expensive homes would be offensive for those who resent the presence of outsiders or structural development.

On the other hand, existing residents may appreciate the ability to visit a previously inaccessible area regardless of nearby uses.

Impact on West End residents

Residents of Pāpōhaku Ranchlands and Kaluako'i would have a direct relationship with the Lā'au Point Project. These areas are currently fairly isolated, and the project would bring increased activity due to the shared access road with Lā'au Point residents and those using the public access.

5.4.4. Project Significance and Mitigation

As previously discussed, the Lā'au Point Project is not expected to have the same magnitude of impact as the development of Lāna'i or West Maui.

A significant impact on the social environment is the embodiment of negative expectations related to Lā'au Point residents and the public controversy. Project opponents have focused on Lā'au Point as *the* problem. While the Project itself does not generate this impact of negative, it is the target of intense criticism.

The heated nature of this controversy has a detrimental effect on the social environment. It causes social disharmony and stress. In focus group sessions and interviews conducted for this study, people repeatedly said that they do not go to meetings because of confrontational behavior. They feel intimidated and have become less inclined to participate in public meetings. Kūpuna were concerned that this type of behavior was becoming more common. The mitigation to offset this already existing impact is to give people the opportunity to learn about the Project and the Plan in a non-confrontational setting so that they can make an informed decision on their own.

Regarding social interaction and relationship, the Project does not add a new element to Moloka'i's social environment. The community is already experiencing change, and East Moloka'i in particular has undergone transformation.

Recent real estate transactions suggest that affluent people are continuing to buy expensive homes in East Moloka'i. From January 2000 to May 2006, there were 83 real estate transactions, not including family transfers and other non-applicable transactions. The mean selling price for the total inventory, not including the highest and lowest values, was $334,774. In contrast, the mean selling price of the 47 homes in Maunaloa, Kualapu'u and Kaunakakai was $235,586. [23]

Interaction between existing residents and affluent newcomers is therefore already occurring. And from accounts in interviews and meetings, Moloka'i Style is still persistent and resilient in spite of these new residents.

To mitigate potential social conflicts due to economic disparities between the existing and new residents, there needs to be social integration on a regional level. Newcomers need to be informed of and sensitized to local values and lifestyle. Existing residents could help the new residents assimilate into the community using practices recommended in the Community-Based Tourism Plan. This scenario of mutual adjustment and acceptance is very likely, especially given the acceptance and aloha that is characteristic of Moloka'i Style.

[23] *Information provided by Ke 'Aupuni Lōkāhi, with assistance from local realtors.*

In terms of community experience at Lā'au Point, it is crucial that existing residents feel welcome to use the public accesses and visit the shoreline. Expectation management should be incorporated in the resource management program orientation so that shoreline visitors are comfortable with the new development. Also, to the extent possible, the structures should be located to limit visibility from the shoreline. This would enhance the natural setting for shoreline visitors and provide privacy for the homeowners.

Regarding impacts on Pāpōhaku Ranchlands and Kaluako'i residents, improvements to shared infrastructure would help to balance the impacts related to increased users and activities. In meetings and interviews with these residents, they had several suggestions which are included in Section 4. Further discussion on these matters is recommended.

5.4.5. Social Impacts of No-Project Scenario

Except for the impact related to negative expectations and current community conflict, Project impacts on the social environment are manageable and can be mitigated, as discussed in the previous section.

The Project's most significant impact on the social environment is its enabling of the Community-Based Land Use Plan. While many parts of the Plan are important, its core social value is the provision for community control and self determination. It is community control that will help existing and new residents take care of the shoreline and other conservation areas. It is community control that will mālama cultural resources and promote subsistence activities. It is community control that will develop the right type of affordable housing and will make sure that Moloka'i Style is perpetuated.

This type of community control strengthens the social fabric because it allows people to make meaningful contributions within a predictable framework. Hence, while, the Project by itself is just a development project, its contextual impact in the Plan has major social significance and value.

Non-implementation of the Project is even more significant. If the Project is not implemented and MPL seeks other alternatives, the future of its holdings is uncertain. The community would lose control of resources, and economic opportunities would decrease. There may be multiple landowners, which would make it difficult to develop a cohesive and comprehensive plan for West Moloka'i. The uncertain future of land uses and cultural and environmental resources, coupled with diminished hope for jobs, would cause social anxiety and tension and stress social and health services.

Unemployment and out-migration rates would likely increase. Further, for those who would lose their job or business due to business closures, financial pressures and family stress would result and they would need to find alternative means of support.

5.5. Impacts on Public Services and Facilities

5.5.1. Police Protection Services

Moloka'i police protection services are provided by the Maui County Police Department. The Police Station is located in Kaunakakai, next to the Kaunakakai Fire Station. In addition to the Commanding Officer position, there are 29 positions including:

- One Lieutenant
- Six sergeants
- Twelve patrolmen
- Five dispatchers
- One school resource officer
- One community officer
- One auxiliary officer

Approximately 90 per cent of the police officers are from Moloka'i.

A minimum of two officers and one sergeant are on duty at any given time. The island is divided into an east and a west beat. Each beat has three eight-hour shifts, and each shift is staffed by one officer.

The Moloka'i community is very rural in character. The most frequent crime problems revolve around domestic quarrels, neighbor disputes and family quarrels. Many of these are situational; younger males are sometimes participants in fights. Some problems could stem from stress related to financial issues due to the high unemployment rate. Moloka'i also has a drug use problem like every other community after the introduction of crystal methamphetamine to Hawaii. [24]

[24] *Personal communication with Captain Dan Matsuura, Maui County Police Department, Moloka'i Division, July 25, 2006.*

The Project will directly impact police protection services due to increase of people and activity on and around the Project site. During construction, construction activities will increase activity and access on private property. In the long-term time frame, there will be an increase in demand from the additional population, more homes and property, and increased activity resulting from public parks and more public accesses. Lā'au Point is very remote and the response time for all emergency services is about 25 minutes. Further, the population in the Kaluako'i region is dispersed.

To mitigate impacts, the Police Department should be kept informed of each stage of the construction process in anticipation of security or traffic issues. Further, on-site private security services can help to deter trespassing, loitering and property crime.

The Project will have an indirect impact on police protection services due to implementation of the Plan. Additional population would result from the increase in affordable housing units, and portions of conservation land may be accessible for cultural and subsistence uses. Specific impacts of these efforts are outside the scope of this study, and would need to be analyzed the implementation of these Plan components progresses.

5.5.2. Fire Protection

Three fire stations serve Moloka'i. The main station is the Kaunakakai Fire Station located next to the Police Department. An engine company, Kaunakakai Fire Station has an Engine and Tanker, a rescue boat and a utility truck. There are five to six firefighters on duty every twenty-four hours.

The Ho'olehua Fire Station serves the west end, and houses a full five-man engine company. The Pūko'o Fire Substation is 16 miles east of Kaunakakai and houses a two-man engine company.

In addition to fire emergencies, the department has first responder medical assistance capability when needed. Emergency Medical Service, or EMS, is provided by Medivac, a private ambulance service of American Medical Response Company. EMS has two ambulances, one with two people on duty and a backup ambulance serviced by call-back personnel.

The Project will directly impact fire protection services due to the increased demand generated by additional population, the presence of more structures, and increased activity at the parks and along the shoreline. The Project area is about 25 to 35 minute response time from the Ho'olehua Engine Co. station and about 20 additional minutes from Kaunakakai Engine Co.

Most responses to the project area would probably be medical related given the older population. Further, there is a risk of brush fires in the area due to dryness and high winds. Due to the remoteness and long response-time, brush fires can have a considerable head-start.

Mitigation measures to address these impacts include:

- Inform residents that keeping driveways open for fire truck and tanker access is their responsibility.
- The access points at the public parks at either end of the project should be designed for jet ski launch capability. There should be clearly defined access points within the Project area. [25]
- Water rescues such as wind surfers, diver and swimmer related accidents can be handled by jet skis. Fishing boat accidents would require the rescue boat. Newspaper accounts of helicopter assistance (from Maui) being used in searching for lost boats or swimmers, though uncommon, give Moloka'i additional ocean rescue capability. [26]

The Project will have an indirect impact on fire protection services due to implementation of the Plan. Additional population would result from the increase in affordable housing units, and portions of conservation land may be accessible for cultural and subsistence uses. Specific impacts of these efforts are outside the scope of this study, and would need to be analyzed as Plan implementation proceeds.

[25] *Currently the Fire Department's 21 foot rescue boat is launched from Kaunakakai. The feasibility and community acceptance of boat launch facilities is undetermined at this time. Given the past and possible future boat landings at Lā'au Point, there is strong community concern that outside boaters would be inconsistent with subsistence activities along this shoreline.*

[26] *Personal communication with Captain Wren Westcoatt, Kaunakakai Fire Station, July 27, 2006.*

5.5.3. Medical Facilities

Moloka'i is served by the Moloka'i General Hospital, which is part of the Queens Health System based in Honolulu. Located in Kaunakakai, the Moloka'i General Hospital houses 15 patient beds, of which 13 are acute care beds and two are long-term care beds. Its service population is the island of Moloka'i. [27]

Services include:

- 24-hour emergency room
- Inpatient services
- Family planning/midwifery
- Family doctor/internist
- Laboratory
- Physical therapy
- Radiology
- Ultrasound
- Mammography
- CT (cat scan)
- Bone density testing
- Echo-cardiograms

In addition, there are specialty clinics for appointment visits including

- Allergist
- Cardiologist
- Endocrinologist
- Gastroenterologist
- General surgeon
- Nephrologist
- Ophthalmologist
- Orthopedist
- Pediatric-develop mentalist
- Physiatrist
- Podiatrist
- Urologist
- Veterans' affairs

[27] *Information was provided by Punahele Alcon, Administrative Assistant, Moloka'i General Hospital, August 31, 2006*

In June, 2005, Moloka'i General Hospital celebrated the opening of a new wing to their facility. The $7.5 million project represents completion of Phase I of the development, conceptualized in 1997. The new wing includes two new trauma rooms, new CAT scan, new radiology room, emergency room, delivery room, and storage rooms among others. Work on Phase II, which included the relocation of the Women's Health Center and expansion of the medical office, was to begin shortly thereafter. [28]

In addition to the hospital, Moloka'i's medical services include a rural health clinic that is part of the hospital, two private physician practices, a midwife, three dental practices, a community health center, and one chiropractic clinic. Other medical and health services include three mental health care homes, an area health education center, Care Resources (nursing home without walls), ambulance medical response, Moloka'i Occupational Center, Na Pu'uwai, Kalua Ola Hou, Molokai Drugs, and several government programs. [29]

The Project will directly impact hospital services by increasing the service population; the service area will be unaffected. It is anticipated that on-site residents will be older than the general population, and thus require a higher level of service.

The low level of permanent population will help to offset impact on health care services. Further, it is expected that on-site residents will have live-in caretakers and caregivers, thereby reducing the need for medical and health services.

The Project will have an indirect impact on medical and health services related to implementation of the Plan. Additional population would result from the increase in affordable housing units. Specific impacts of these efforts are outside the scope of this study, and would need to be analyzed as the implementation of these Plan components proceeds.

5.5.4. Public Schools

Moloka'i has six public schools, including three elementary, one conversion charter school elementary, one intermediate and one high school. In the last three years, educational resources were expanded to include a private charter high school and a private charter middle school. Maui Community College offers post-secondary opportunities.

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[28] *Tracy Liu, MGH unveils its new wing, **The Moloka'i Island Times**, Volume 01, Issue 23 (June 29, 2005).*

[29] *Center for Rural Health Works, **Island of Molokai, Hawaii, Medical Service Area - Economic Impact of the Health Center** (September 2005), Table 9: Direct Economic Activities of the Health Sector, Island of Molokai, 2005.*

Project residents would be served by Maunaloa Elementary School for kindergarten through grade six, Moloka'i Intermediate School for grades six through eight, and Moloka'i High School for grades nine through twelve. Other options include the three charter schools.

Located in upper Maunaloa town, Maunaloa Elementary School has been experiencing decreasing enrollment, from 73 students in 2003, to 69 students in 2004, and to 57 students in 2005. Moloka'i High School is located in Ho'olehua. It experienced decreasing enrollment from 446 in 2003 students to 405 students in 2004, and a minor increase to 408 in 2005.

The Project impact on the public education system was assessed in the economic and fiscal analysis. It was found that in the permanent resident population, at full build-out, less than 25 students are projected. This includes less than ten students in kindergarten through grade six, and less than 15 students in grades seven through twelve.

These estimates are based on a low housing occupancy rate, the age of the anticipated population and educational preferences. Approximately 30 percent of the La'au Point residents are expected to be permanent residents and the new residents are expected to be older than the general population. About 25 percent of the permanent residents are expected to have children under 18 living at home; another ten percent are estimated to have family members over 18 living at home. Further, it is likely that some of the Lā'au Point residents will home school or send their children to private schools.

The Project impact on educational facilities is therefore expected to be minimal. Mitigation measures are presented in the economic and fiscal analysis. [30]

[30] *Knowledge Based Consulting Group,* ***Economic and Fiscal Impacts of the Proposed La`au Point Residences on Molokai, p****repared for Molokai Properties Limited (April 2006).*

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Appendices

Appendix A: Written Comments From the Public Meeting

One person submitted the following comments:

- *The Land Use Plan guarantees cultural, substance, environmental, economic sustainability. Without a plan, the island will be destroyed. The focus is on a minor part of the plan – 200 homes. I'll be dead before 200 homes are built – just as Pāpōhaku Ranchland developed slowly.*
- *Having economic development will allow families to qualify for homestead properties, affordable homes, self-sufficiency, etc.*
- *The future is not bright without this plan. Technology will allow development of the land – make water. This technology is around the corner. With land in the land trust, it stays under the stewardship of* Moloka'i. *This land will be protected from development,*
- *Two hundred homes will not bring permanent residents. The expansion of Hawaiian homesteads will perpetuate the dominance of Hawaiians population-wise. Three month residents don't get involved in the community.*
- *The island real estate market has already stressed the island. The land use plan will bring stability to the west end.*
- *Moloki will change; there is no such thing as staying the same. The plan helps reduce impacts by the community input and charting a course for the future.*
- *The population was once 10,000 on Molokai. Memories are short.*
- *In the community plan, a larger development was approved. The plan has a smaller development.*
- *Subsistence is part of the plan. The plan wants to perpetuate subsistence.*
- *Hawaiian culture will survive. The plan shows a sensitivity for culture to allow for Hawaiian practices. The rules are developed by Hawaiians for the community and Hawaiians. That is better than a foreign landowner.*
- *This plan is an agreement for the future.*

Appendix B: Written Comments from West End Residents Focus Group

One couple submitted the following comment:

As full time residents of Moloka¹i for the past 19 years (and part time residents for an additional 5+ years), we¹d like to voice of wholehearted support for the La¹au Point Project under discussion at meetings being held this coming week. Having attended planning meetings related to La¹au since the very beginning, we stress that our support has not changed and that we firmly believe the project is good for the island and that the years of careful planning will benefit the people of Moloka¹i.

Specifically, this project is in deed low-impact and most certainly being planned with environmental and aesthetics in mind. Issues such as water, erosion and land preservation, care of flora and fauna all have been addressed.

In the latter case, in regard to fishing and hunting, we¹d like to add that from our experience some of the very people who oppose the project in respect to fishing and hunting are the very folks who are misusing these precious resources and at times endangering the lives of islanders during poaching expeditions.

As for the cultural aspects of the project, great care has been taken to include preservation in a very sensitive and caring manner. This in itself is exciting and a win/win for the island and those who treasure Hawaiian heritage.

Not to be forgotten, the financial benefit the project will have for our island that most certainly needs all the help it can get in terms of employment and economic input. To survive Moloka¹i must feed its economic engine. Controlled growth such as this will does just that meaning that residents will be able to remain on their home island and will be able to raise their families in a healthy and productive social setting. Stagnation is not the answer nor is massive development. Thus, La¹au is a perfect solution.

Beyond this is the Land Trust element that has been incorporated and which will benefit and save the entire island for generations to come

I think it is important for those reviewing this project to fully review the standing and credentials of those who oppose this important project. The agenda of the vocal minority group and its funding source should be noted as their negative campaign is nothing new on-island and has disrupted the community for years. Be it the well organized hui or West Enders with NIMBY mentalities, their goal is and has long been to bring down the Ranch at the expense of the good folks who hope to have a future on Moloka¹i. Please, in considering this matter, don¹t base your conclusions on bumper-sticker mentality and paid ads in newspapers. There is a huge, albeit, silent majority who want this project to go through and want to see Moloka¹i succeed. Again, please think beyond the negative rhetoric much of it wrong and hyped for propaganda purposes.

In conclusion, we truly believe that a controlled growth project such as La¹au Point could well serve as a model for others. The Ranch and the EC are to be congratulated for devoting so much time and effort in working with the community at large and for thinking to the long-term sustainability of our fragile environment and those who live here. Again, we commend them and strongly support the La¹au Point Project.

Thanks to all who have worked so long and hard during the planning phase.

Their dedication and unselfish desire to ensure better time for Moloka¹i are remarkable as has been their creative thinking with a view to the future.

Mahalo nui loa!

The following comment was submitted by an individual after the meeting:

I have one comment that I neglected to make at the meeting which does relate to social impact/quality of life specifically to residents of Maunaloa, Pāpōhaku Ranchlands, Moana Makani, Kaluakoi Hotel guests, the condo owners and renters and the Fairway residents as well as future owners at La'au Point. I understand that a parcel of land has been designated to house a ***FIRE STATION****. Rather than just a parcel, I propose that MPL and its partners, commit to* ***building a fire station as part of the overall plan.*** *The facility would then be transferred to the control of Maui County.*

As a practical matter, most insurance companies will not write policies because the community is located a distance from a fire station which they consider an unacceptable risk. Perhaps as a result of having first responders within a reasonable distance of emergencies, one of the many lives lost on our West End beaches could be saved. A fire station would serve the entire West End community, not just the proposed La'au Point.

I can't stop thinking about it and need to underscore the importance of the negative impact it will have on Moana Makani, Ranchlands and Fairways residents....that is the use of Kaluakoi Road as the access point. I saw a report of the Maunaloa meeting you held and noticed that comments had been made in support of constructing the road through their town. Initially, it probably falls under economic impact however the fall out of NOT allowing economic development is negative social impact....poor schools, no job opportunities and the social vitality of the town. MPL seems to be turning a deaf ear to this suggestion.....as is sometimes said "don't confuse me with the facts, my mind's made up".

Appendix C: Written Comments from Filipino Focus Group

One person submitted the following comment:

I feel that the Laau Development will not impact Molokai's lifestyle.

- *We want people to have jobs.*
- *Get off of welfare and learn how to work and be self-sufficient.*
- *No other landowner would even think of giving any community ¾ of their lands. This opportunity is rare.*
- *Having more new money on island will help all businesses, schools, churches, etc.*

My family is in support of Laau development. I appreciate you letting us write our comments. We are not public speakers. Too intimidating.

One person submitted the following comment:

The project is a great opportunity for the people of the community to be self-sufficient. Will create continuing jobs for the people. The amount of land that will be sold is limited so I don't see any threat of mainlanders or rich people disrupting the present Molokai.

Appendix Q

Preliminary Engineering Report

Established 1969

Preliminary Engineering Report

Laau Point Project at West Molokai, Hawaii

TMK: (2) 5-1-02: Portion of 30

Prepared For:
Molokai Properties, Ltd.
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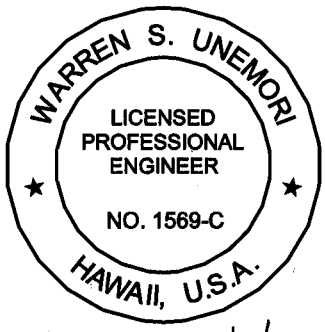

Date: July 2006
Revised: November 2006
Revised: August 2007

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for
Laau Point Project at
West Molokai, Hawaii

I. INTRODUCTION

The applicant, Molokai Properties, Limited (MPL), is asking the State Land Use Commission to change the land use designation of approximately 842 acres of ag land to rural that would ultimately allow for the subdivision of this area for 200 rural homesite lots averaging 2 acres each. They will also be seeking a County of Maui Community Plan amendment and change in zoning of the project area from ag to rural.

This report briefly describes and evaluates existing infrastructure in the project vicinity. It also provides a brief summary of probable infrastructural improvements that will be constructed to support the project.

II. PROJECT LOCATION AND TOPOGRAPHY

The project is located at the southwest tip of the Island of Molokai. The project area encompasses a band of land ranging from 1,500 to 2,000 feet inland of the existing conservation district boundary. The land along the western coastline extends approximately 10,400 feet north of Laau Point terminating at Kaupoa Beach Camp. The land along the southerly coastline extends approximately 15,400 feet east of Laau Point towards Hale Lono Harbor.

Existing grade across the westerly parcel ranges from 25 feet at the conservation line to approximately 125 feet along its mauka boundaries. Cross slopes varies between 3 to 7 percent. The southerly parcel of land has a steeper cross slope ranging from an elevation of around 50 feet at the conservation line to approximately 200 feet along its mauka boundaries. This translates to cross slopes that range between 7 and 15 percent, although steeper slopes can be found in isolated areas in between.

III. EXISTING INFRASTRUCTURE

3.1.a Potable Water:

MPL operates two water systems that serve West Molokai.

The Molokai Ranch Mountain System (MRMS) taps surface water from the mountains in central Molokai and conveys it to Puu Nana water treatment plant for Maunaloa and the Industrial Park. In addition, it provides water for landscaping at Maunaloa Village, the Lodge and Kaupoa Camp as well as water for the Ranch's livestock. Seasonal flows vary between 1,300,000 gpd and 65,000 gpd. The average yield of this system is 500,000 gpd. This system's mountain source has a storage capacity of 39,000,000 gallons which helps to compensate for the seasonal fluctuation in source.

The source of water for the Kaluakoi water system is well 17, east of Kualapuu. In December 2001, MPL acquired the assets of Kukui (Molokai) Inc. including its water system and its water use allocation of 1,018,000 gpd. Current use of the Kaluakoi system, with the Kaluakoi Hotel totally closed, is approximately 800,000 gpd. Water from well 17 is transported via rental space in the Molokai Irrigation System to Mahana. It is then pumped to a 7,000,000 reservoir at Puu Nana for treatment. The treated water is then piped to a 3.0 MG reservoir in Maunaloa and gravity fed to Kaluakoi. The Kaluakoi distribution system terminates approximately 9,000 feet north of the Laau Point project site.

3.1.b Non-Potable Water:

Although untreated mountain water is being used for irrigation in Maunaloa, water from the existing, but currently unused Kakalahale well above Kaunakakai, is proposed to replace this irrigation water source. Mountain water presently being used for irrigation will then be treated and converted to augment the potable water supply for West Molokai.

3.2 Sewer System:

The project site is obviously not sewered. Although, Maunaloa Village which is located approximately 5.60 miles northeast of the project site, has its own private sewer system, the distance and grade makes it impractical to pump wastewater from the project site to Maunaloa.

Kaluakoi depends on individual wastewater systems to handle its sewer in accordance with DOH rules and regulations.

3.3 Drainage System:

There are several drainageways that transect the project site in the mauka/makai direction. Runoff in these gullies will be allowed to pass through the project site uninhibited. The present flow patterns in these channels will be preserved. Where roads cross these drainageways, culverts will be installed to convey the 100 year flows across the roadway.

Perforated risers will be added to the inlets of these culverts as shown in Exhibit 7. In addition, subject to the availability of boulders from the roadway excavation, boulder berms will be constructed upstream of some of the inlets to reduce the velocity in the drainway and also to induce gravitational settling of water borne silt and debris before it enters the culverts. Energy dissipators will be constructed at the outlets of these drainage culverts to keep the velocities equal to or less than pre-development velocities, in accordance with the provisions of Article 15-04-06 subparagraph (8) of Title NC-15, "Rules for the Design of Storm Drainage Facilities in the County of Maui."

3.4 Roadway:

Primary access to the project will be from Kaluakoi Road which is located 9,000 feet north of the project site. This is a 22 feet wide paved road.

Maunaloa Highway, which is a State Highway, terminates at Maunaloa Village. Hale Lono Harbor is served by a coral-based unpaved road which abuts the

southeast corner of the project site. This road connects Hale Lono Harbor to Maunaloa Highway.

3.5 Electrical, Telephone and CATV Systems:

Currently, there is an underground distribution system in Kaluakoi north of the project site. There is also an overhead system that runs to Hale Lono Harbor east of the project site.

IV. PROPOSED INFRASTRUCTURAL IMPROVEMENTS:

4.1.a Potable Water:

A new potable water system will be extended from Kaluakoi to the project. All lots will be metered separately. For the near term needs, water from MPL's mountain source will continue to be treated at the Puu Nana treatment plant. Long term sourcing is proposed to come from well 17 and MPL's mountain source as current non-potable uses being supplied by these sources are shifted to the non-potable source from Kakalahale well. When customer demand in Kaluakoi warrants, the Laau Point distribution system will be looped to the Maunaloa system, thereby augmenting the systems at Kaluakoi and the Laau Point project.

Probable water demand at full buildout is projected at 96,000 gpd. This is based on 80% occupancy of the 200 lots at 600 gpd, exclusive of irrigation.

4.1.b Non-Potable Water:

Initially, water for irrigation and fire protection will be provided from surplus mountain water. In the long term, brackish water from Kakalahale well will be used for irrigation and fire protection. A storage tank or reservoir will also be constructed above the project site to provide adequate pressure and to meet the storage requirements for fire protection. All lots will be metered. Fire hydrants will be installed along the road spaced at intervals between 450 to 500 feet. Various alignments are under consideration to bring non-potable water to the project site

from the Kakalahale well source. The applicant projects that the non-potable demand at full buildout will be around 300,000 gpd.

4.2 Sewer System:

The applicant proposes to install a central package treatment plant for the project. Individual homes will be connected to this plant via a low pressure force main. The treatment plant will be designed to provide tertiary quality water suitable for use of common area landscape irrigation.

At full buildout and 80% occupancy, the project could generate as much as 70,000 gpd of wastewater; however, daily flows of approximately 20,000 gallons are anticipated due to projected average occupancy of 30%.

The wastewater treatment and collection system will be designed and constructed in full compliance with State Department of Health Rules and Regulations.

4.3 Drainage System:

Roadways constructed across existing drainageways will be provided with culverts to convey offsite runoff safely across them. Storm drainage systems will also be installed along the roadway shoulders to convey pavement runoff into the closest drainageways. Subsurface storage and filtration systems will be installed at the end of each roadway drainage system to intercept water borne silt and other debris before they are discharged into the drainageways and State waters.

Additional runoff generated by each lot will be retained on the lot in onsite surface or subsurface retention systems. This is to ensure that additional runoff generated by the project is kept within the project limits all in accordance with the provision of the Maui County's Storm Drainage Standards.

The current runoff from the proposed 200 lots and roadways is 512 c.f.s. for a 50-year 1-hour storm. This is expected to increase by 111 c.f.s. to 623 c.f.s. The total volume needed to store this increase is 152,390 ft^3. Since the increase in runoff

due to the roadway pavement is estimated at (53/111) = 48%, approximately 52% is attributable to the imperiousness in each lot. The required storage in the roadway and lots are (0.48 x 152,390) = 73,147 ft^3 and 79,243 ft^3 respectively. It is estimated that approximately 20 feet of 5 feet diameter perforated pipe buried in each lot or a retention basin of equal capacity will be required to handle the additional runoff generated during a 50-year 1-hour storm event. See Exhibits 6 and 7 for details of subsurface systems on road and in lots.

4.4 Roadway:

Roads within the project will be designed and constructed in accordance with the Provisions of Section 18.16 of the Maui County Code. All roads will be built to County minor road standards with 40 feet wide right-of-way and 22 feet pavement widths. Grassed swales will be provided on shoulders to convey runoff into a storm drain system. Horizontal and vertical curves will be designed to meet stopping sight distance requirements for residential projects in the County of Maui.

4.5 Electrical, Telephone and CATV Systems:

Electrical, telephone and CATV distribution systems will be extended underground from Kaluakoi. At its eastern terminus, this underground distribution system will be connected to the existing overhead system servicing Hale Lono Harbor to provide an alternative means of serving the project.

4.6 Solid Waste:

Material derived from the clearing and grubbing operation will be chipped and spread over adjoining Ranch Lands and allowed to decompose as organic matter. Boulders and other excavated material that are not recycled and used in the project will be stockpiled in adjoining Ranch Lands also with proper erosion control measures.

V. CONCLUSION:

Based on the foregoing, it is our professional opinion that any project related impact can and will be readily mitigated by initiating Best Management Practices (BMP) during construction and by installing the infrastructural improvements proposed herein by the applicant.

VI. REFERENCES:

1. *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. August 1972. United States Department of Agriculture, Soil Conservation Service.

2. *Flood Insurance Rate Map, Maui County, Hawaii*. Community-Panel Number 150003 0139B. June 1, 1981. Federal Emergency Management Agency, Federal Insurance Administration.

3. *Rainfall Frequency Atlas of the Hawaiian Islands, Technical Paper No. 43*. 1962. U.S. Department of Commerce, Weather Bureau.

4. *Rules for the Design of Storm Drainage Facilities in the County of Maui.* July 1995. Department of Public Works and Waste Management, County of Maui.

EXHIBITS

EXHIBIT 1
LOCATION MAP

0 15000 30000 45000 60000

SCALE: 1 IN. = 15,000 FT.

N

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

November 13, 2006

V:\Projdata\06proj\06021\dwg2004\exhibits\EXHIBIT-LOCMAP.dwg

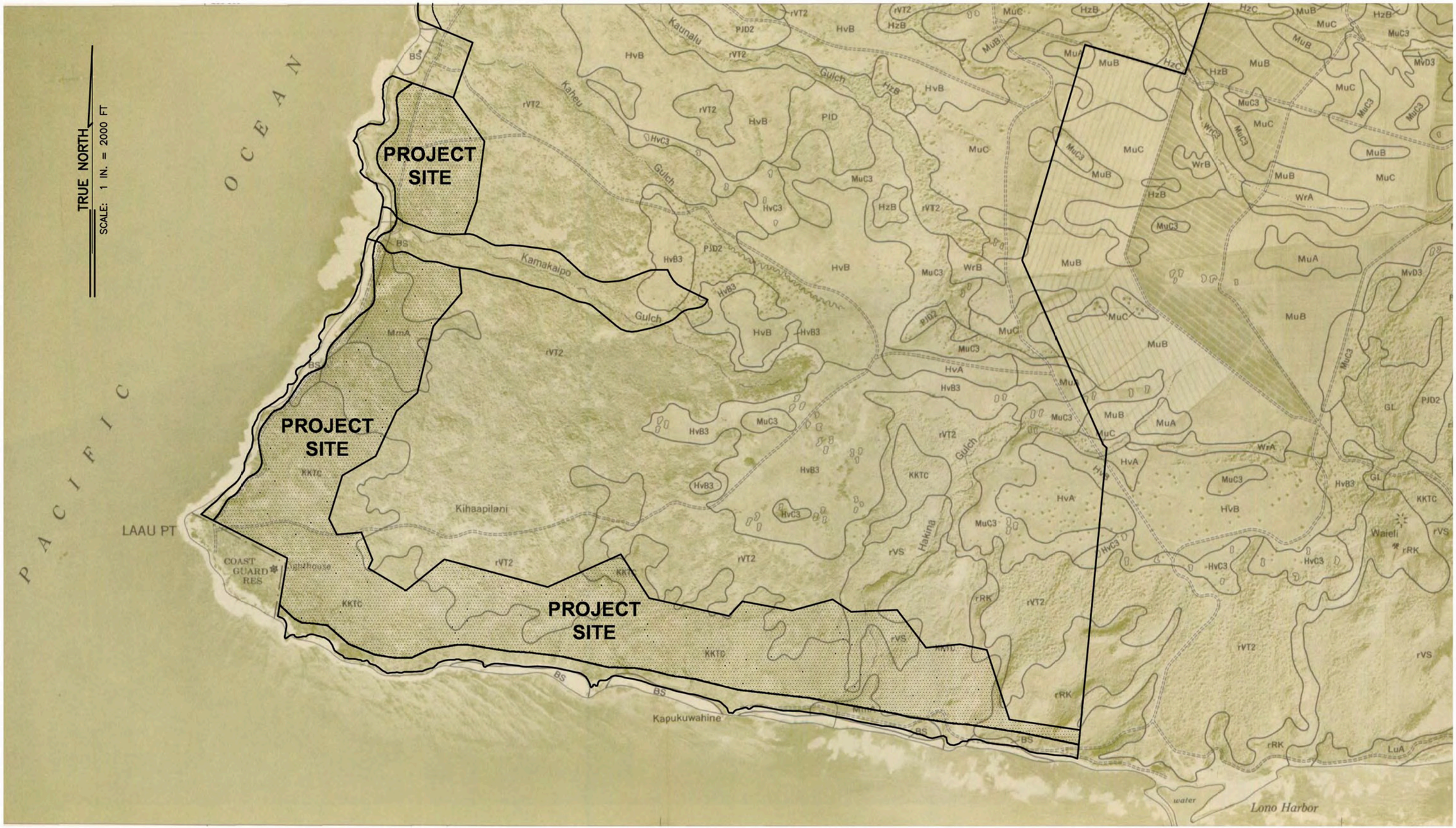


EXHIBIT 2
SITE SPECIFIC SOIL CLASSIFICATION MAP

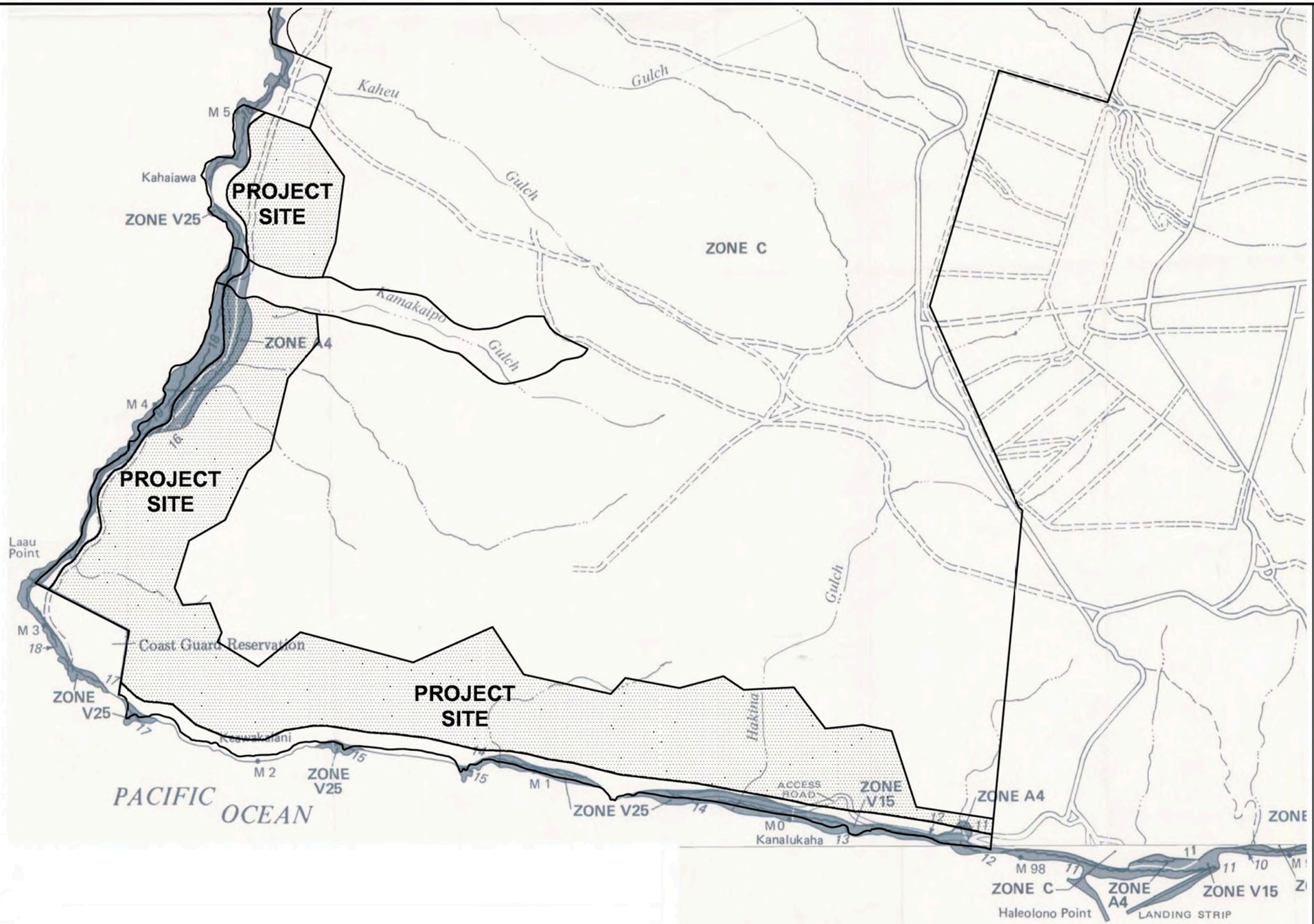
0 2000. 4000 6000 8000

SCALE: 1 IN. = 2000 FT.

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

June 11, 2006

V:\Projdata\06proj\06021\dwg2004\exhibits\Soil-map00.dwg



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MAUI COUNTY, HAWAII

PANEL 25 OF 395
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
150003 0025 B

EFFECTIVE DATE:
JUNE 1, 1981

federal emergency management agency
federal insurance administration

EXHIBIT 3
FLOOD INSURANCE RATE MAP

0 2000. 4000 6000 8000

SCALE: 1 IN. = 2000 FT.

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

June 11, 2006

V:\Projdata\06proj\06021\dwg2004\exhibits\Firm-map00.dwg

LEGEND:

- NATURAL DRAINAGE GULLIES
- EXISTING DRAINAGE PATTERN

EXHIBIT 4 - EXISTING DRAINAGE MAP

0 800 1600 2400 3200

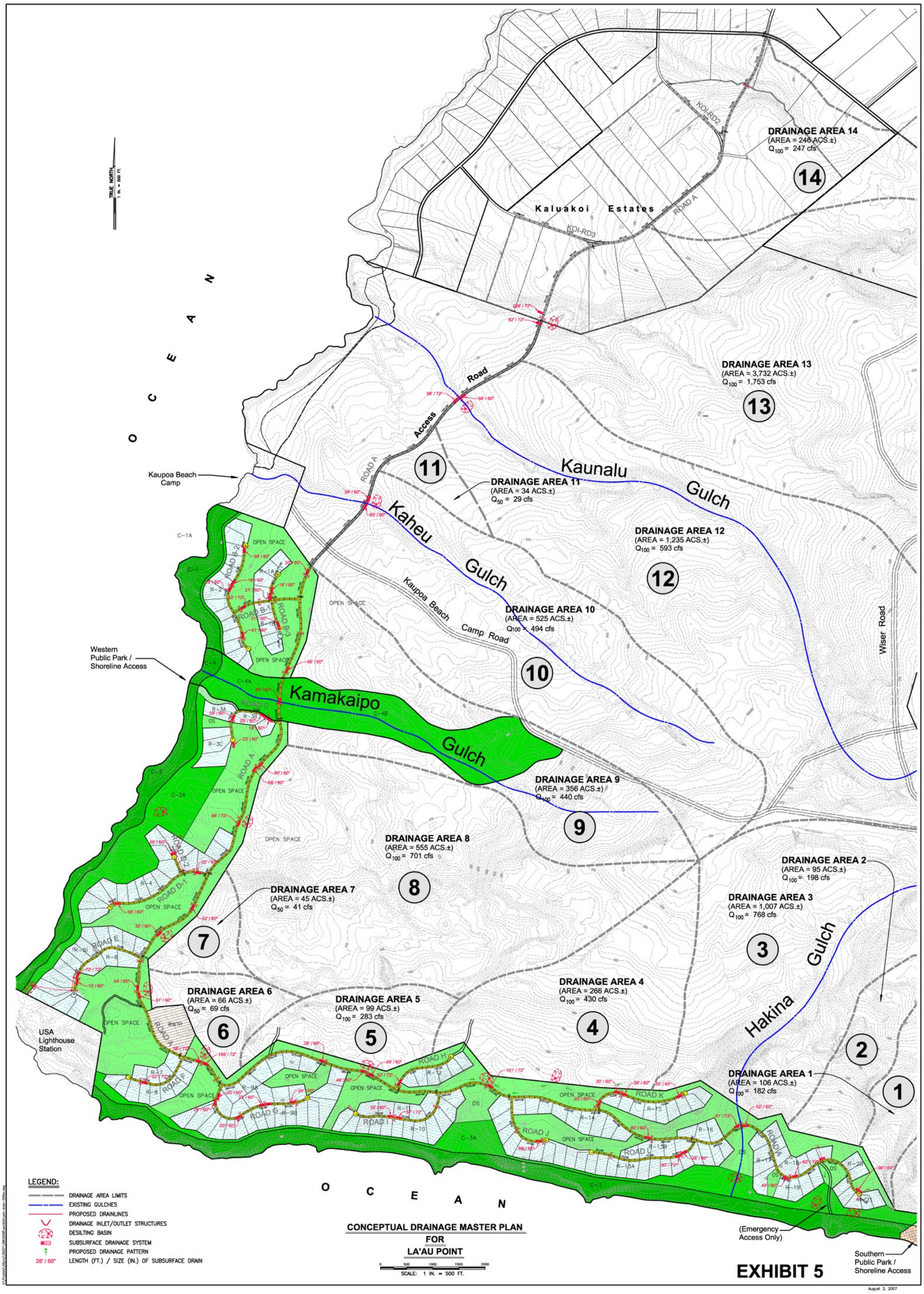
SCALE: 1 IN. = 800 FT.

LA'AU POINT

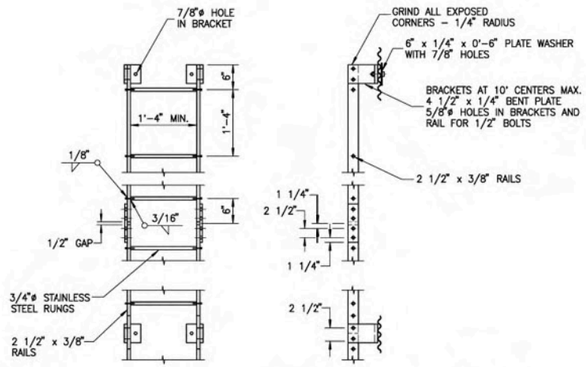
November 13, 2006

24"x36"

WSLE 06021


TRUE NORTH
1 IN. = 500 FT.
OCEAN
Kaluakoi Estates
KOI-RD2
KOI-RD3
ROAD A
DRAINAGE AREA 14
(AREA = 246 ACS.±)
Q100 = 247 cfs
14
Road
Access
DRAINAGE AREA 13
(AREA = 3,732 ACS.±)
Q100 = 1,753 cfs
13
Kaupoa Beach Camp
11
DRAINAGE AREA 11
(AREA = 34 ACS.±)
Q50 = 29 cfs
Kaunalu Gulch
Kaheu Gulch
DRAINAGE AREA 12
(AREA = 1,235 ACS.±)
Q100 = 593 cfs
12
Kaupoa Beach Camp Road
DRAINAGE AREA 10
(AREA = 525 ACS.±)
Q100 = 494 cfs
10
Wiser Road
Western Public Park / Shoreline Access
Kamakaipo Gulch
DRAINAGE AREA 9
(AREA = 356 ACS.±)
Q100 = 440 cfs
9
DRAINAGE AREA 8
(AREA = 555 ACS.±)
Q100 = 701 cfs
8
DRAINAGE AREA 2
(AREA = 95 ACS.±)
Q100 = 198 cfs
DRAINAGE AREA 3
(AREA = 1,007 ACS.±)
Q100 = 768 cfs
3
Hakina Gulch
DRAINAGE AREA 7
(AREA = 45 ACS.±)
Q50 = 41 cfs
7
DRAINAGE AREA 4
(AREA = 266 ACS.±)
Q100 = 430 cfs
4
DRAINAGE AREA 6
(AREA = 66 ACS.±)
Q50 = 69 cfs
6
DRAINAGE AREA 5
(AREA = 99 ACS.±)
Q100 = 283 cfs
5
2
DRAINAGE AREA 1
(AREA = 106 ACS.±)
Q100 = 182 cfs
1
USA Lighthouse Station
WWTP
OPEN SPACE
ROAD B-1
ROAD B-2
ROAD B-3
ROAD C
ROAD D-1
ROAD D-2
ROAD E
ROAD F
ROAD G
ROAD H
ROAD I
ROAD J
ROAD K
ROAD L
C-1
C-1A
C-2
C-2A
C-3
C-3A
C-4
C-4A
C-4B
R-1
R-1A
R-1B
R-2
R-3A
R-3B
R-3C
R-4
R-5
R-6
R-7
R-8
R-9A
R-9B
R-10
R-11
R-12
R-13B
R-14
R-15
R-15A
R-16
R-17
R-18
R-19
R-20
OS
(Emergency Access Only)
Southern Public Park / Shoreline Access
LEGEND:
DRAINAGE AREA LIMITS
EXISTING GULCHES
PROPOSED DRAINLINES
DRAINAGE INLET/OUTLET STRUCTURES
DESILTING BASIN
SUBSURFACE DRAINAGE SYSTEM
PROPOSED DRAINAGE PATTERN
26' / 60" LENGTH (FT.) / SIZE (IN.) OF SUBSURFACE DRAIN
CONCEPTUAL DRAINAGE MASTER PLAN
FOR
LA'AU POINT
0 500 1000 1500 2000
SCALE: 1 IN. = 500 FT.
EXHIBIT 5
August 3, 2007

SPLICE PLATE 2 1/2" x 3/8" x 0'-10"



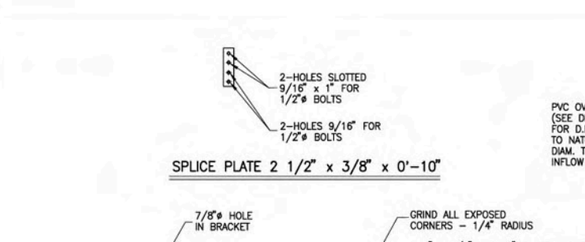
DETAIL - STAINLESS STEEL LADDER FOR CAP MANHOLE

NOT TO SCALE

details/drain/copymh002.dwg

NOTE:

1. LADDER SPLICE PLATE TO BE CONNECTED WITH 1/2"ø BOLTS WITH DOUBLE NUTS.
2. THE DISTANCE BETWEEN STEPS SHALL NOT EXCEED 16 INCHES AND SHALL BE UNIFORM THROUGHOUT THE LENGTH OF THE WALL. PLACE LADDER IN THE WALL WITHOUT AN OPENING.



SECTION "B"-"B"

DETAIL - BAFFLE FOR 72" SUBSURFACE DRAINLINE

NOT TO SCALE

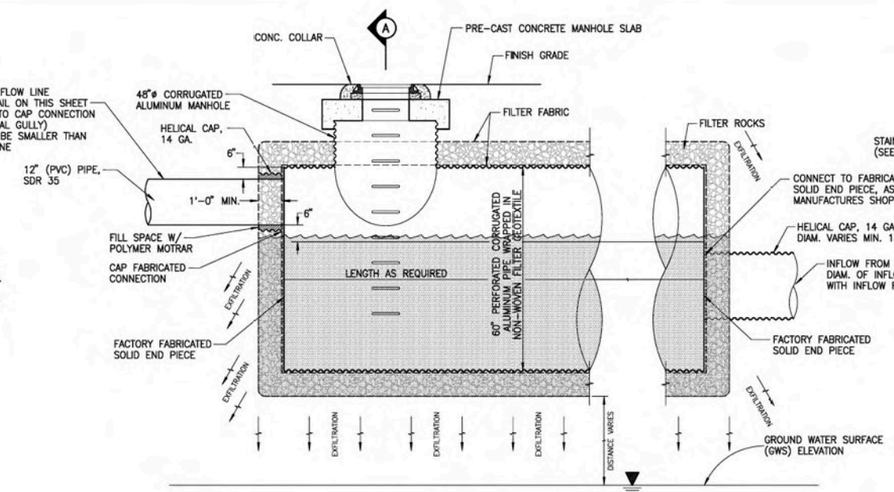
m:/projects/84024/baffle01.dwg

INSET

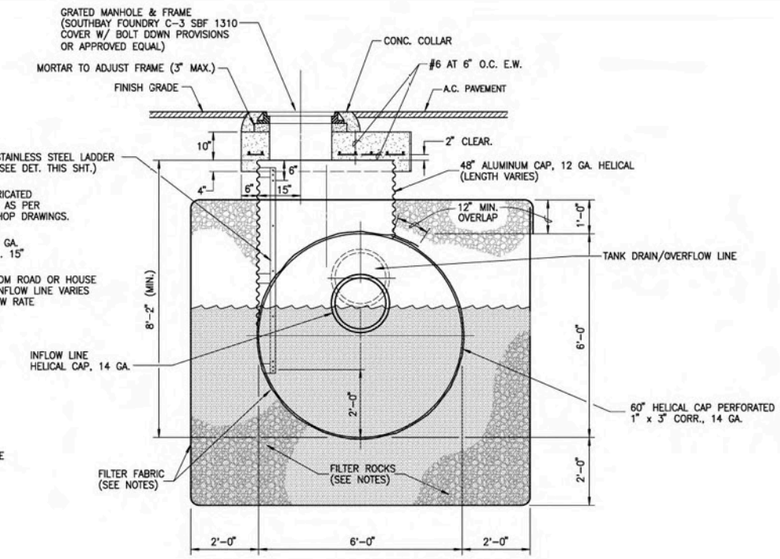
NOT TO SCALE

NOTE:

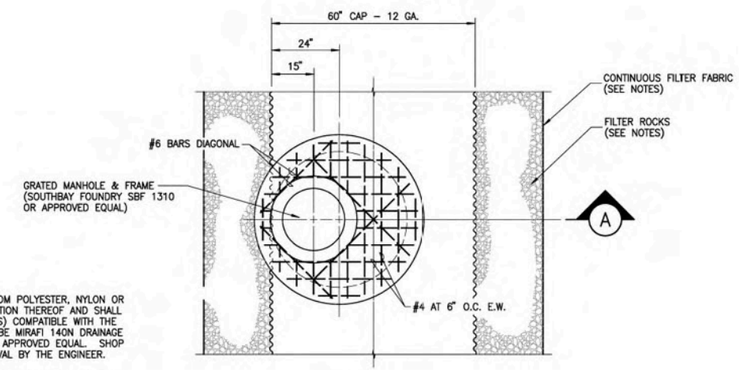
ALL NUTS & BOLTS USED TO FASTEN DRAINLINE BAFFLE SHALL BE MADE OF ALUMINUM



LONGITUDINAL SECTION



SECTION (A)



PLAN

NOTES:

1. FILTER FABRIC:
   FILTER FABRIC SHALL BE MANUFACTURED FROM POLYESTER, NYLON OR POLYPROPYLENE MATERIAL, OR ANY COMBINATION THEREOF AND SHALL POSSESS AN EQUIVALENT OPENING SIZE (EOS) COMPATIBLE WITH THE ADJACENT MATERIAL. FILTER FABRIC SHALL BE MIRAFI 140N DRAINAGE FABRIC, MANUFACTURED BY MIRAFI, INC., OR APPROVED EQUAL. SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER.
2. FILTER ROCK:
   FILTER ROCK SHALL BE ASTM NO. 4 CRUSHED ROCK GRADATION AND SHALL CONFORM TO SECTION 15 OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER, 1986 AND ALL AMENDMENTS MADE THEREOF BY THE CONTRACT DOCUMENTS.

DETAIL - 72" OR 60" SUBSURFACE DRAINLINE W/ CAP MANHOLE ALONG ROADWAYS

DETAIL - 60" SUBSURFACE DRAINLINE W/ CAP MANHOLE FOR SUBDIVIDED LOTS (LENGTHS TO BE DETERMINED)

NOT TO SCALE

details/drain/copymh002.dwg

THE FOLLOWING DETAILS AS SHOWN ON "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984", SHALL BE CONSIDERED PART OF THE CONSTRUCTION DRAWINGS.

PLATE	CONTENTS
D-22	PRE-CAST CONCRETE DRAIN MANHOLE
D-23	PRE-CAST CONCRETE DRAIN MANHOLE DETAILS
D-24	PRE-CAST CONCRETE DRAIN MANHOLE DETAILS
D-25	PRE-CAST CONCRETE DRAIN MANHOLE DETAILS
D-26	CHANNELIZING DETAILS FOR DRAIN MANHOLE
D-27	RUNGS FOR CATCH BASINS AND MANHOLES
D-28	TYPE "DA" FRAME FOR CATCH BASIN AND MANHOLE
D-30	CATCH BASIN AND MANHOLE COVER
D-31	PAYMENT TRENCH WIDTH AND REPAVING FOR DRAIN PIPES

EXHIBIT 6

LETTER	DESCRIPTION	DATE

WARREN S. UNEMORI LICENSED PROFESSIONAL ENGINEER NO. 1569-C HAWAII, U.S.A.

SIGNATURE DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-2 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

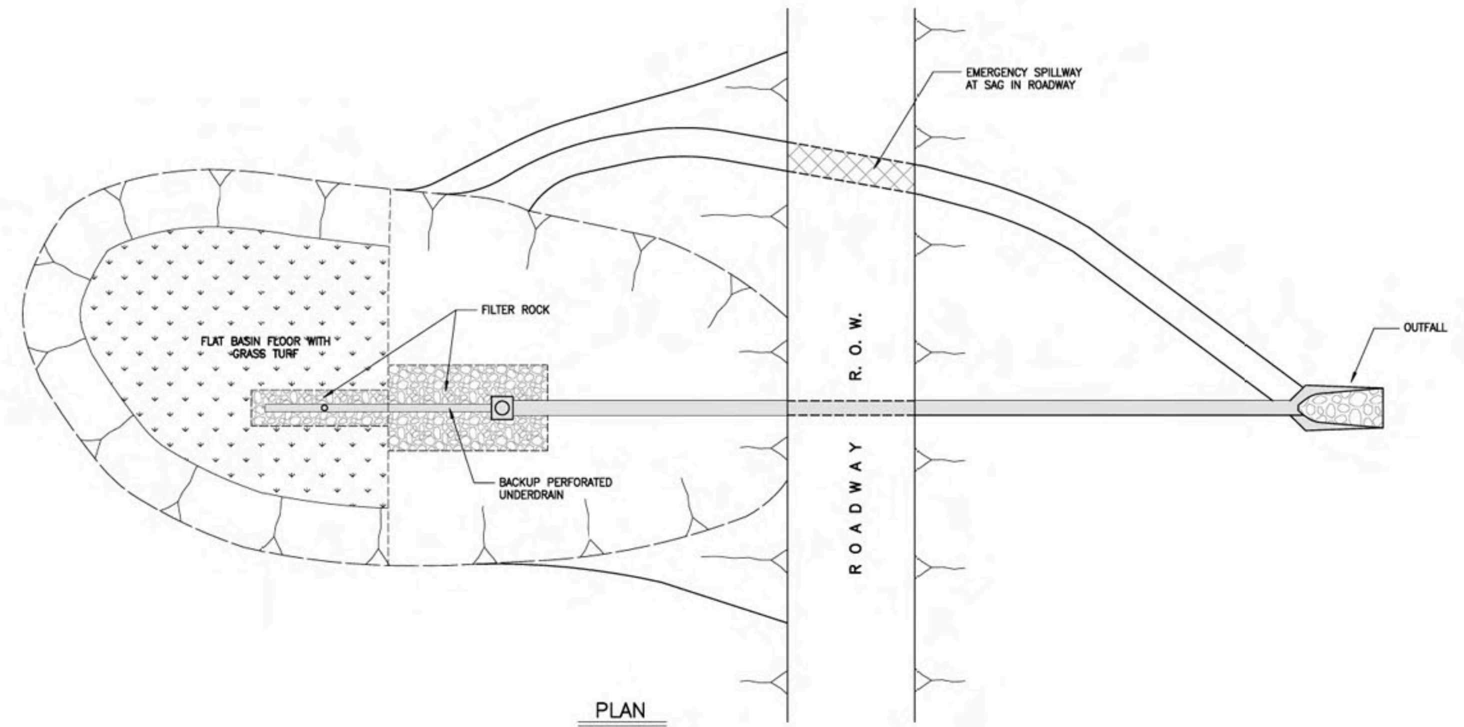
LA'AU POINT RURAL SUBDIVISION

MAUNALOA, MOLOKAI, HAWAII

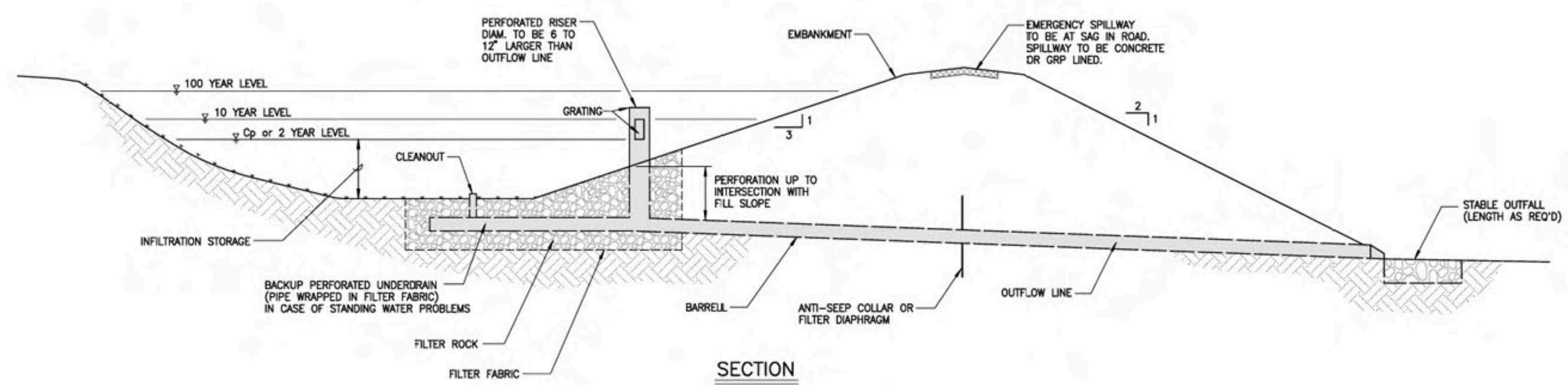
TITLE SUBSURFACE DRAINAGE SYSTEM DETAILS

DESIGNED BY: WSU	CHECKED BY: RMA	JOB NUMBER: 06021	SHEET: XX
DRAWN BY: WIS	APPROVED BY: WSU		
SCALE: AS NOTED		DATE: 6-28-07	OF SHEETS

V:\Projects\06proj\06021\DWG2008\consians\det--dr10.dwg



PLAN
NOT TO SCALE



SECTION

DETAIL – INFILTRATION BASIN

NOT TO SCALE

EXHIBIT 7

LETTER	DESCRIPTION	DATE

WARREN S. UNEMORI LICENSED PROFESSIONAL ENGINEER NO. 1569-C HAWAII, U.S.A.

SIGNATURE DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-2 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

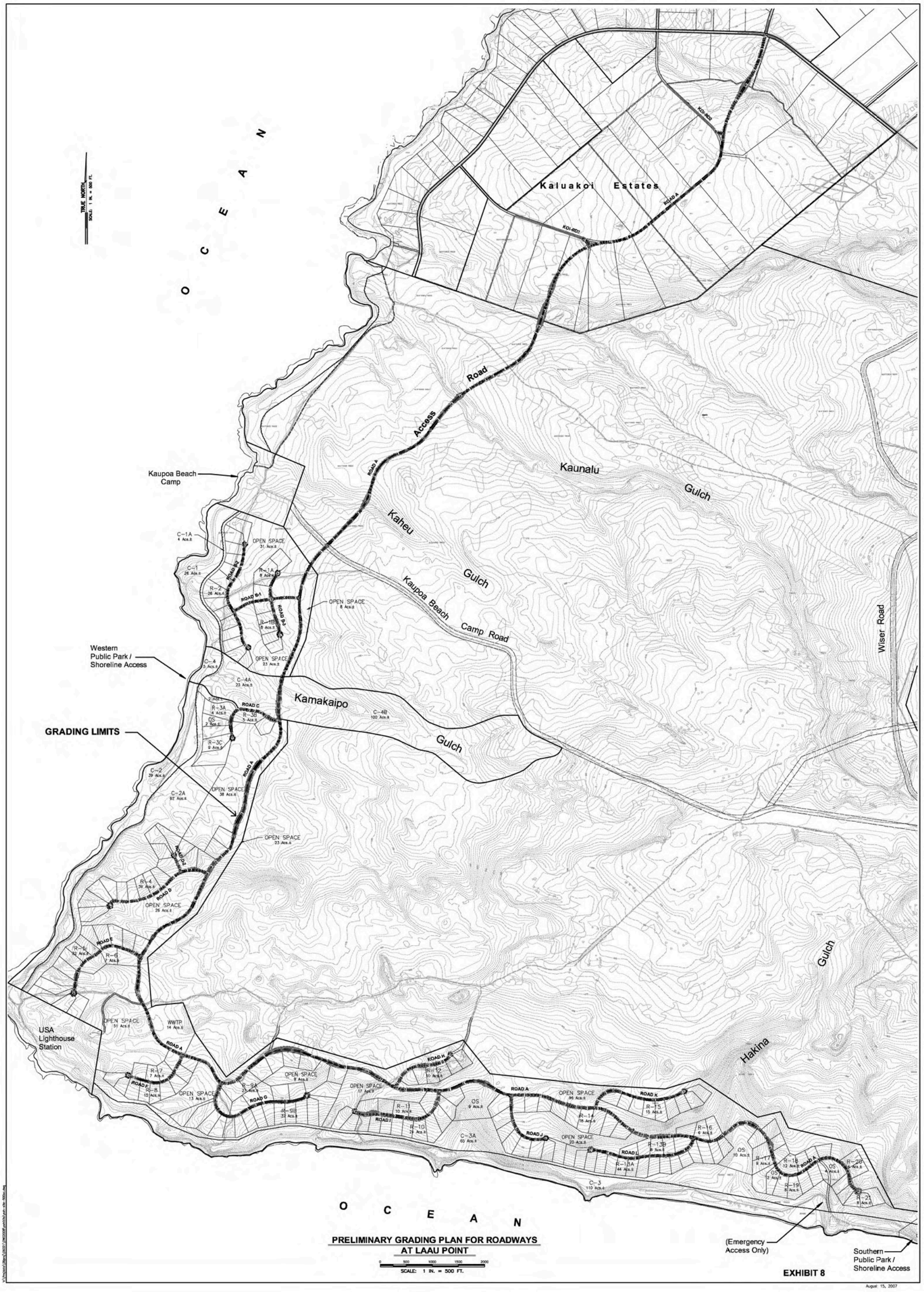
LĀ'AU POINT RURAL SUBDIVISION

MAUNALOA, MOLOKA'I, HAWAII

TITLE RISER DETAIL FOR DESILTING BASIN

WSU DESIGNED BY	RMA CHECKED BY	06021 JOB NUMBER	XX SHEET
WIS DRAWN BY	WSU APPROVED BY	6-28-07 DATE	OF SHEETS
SCALE AS NOTED			

V:\Projdata\06proj\06021\DWG2008\conplans\det-drn0.dwg



PRELIMINARY GRADING PLAN FOR ROADWAYS AT LAAU POINT

0 500 1000 1500 2000

SCALE: 1 IN. = 500 FT.

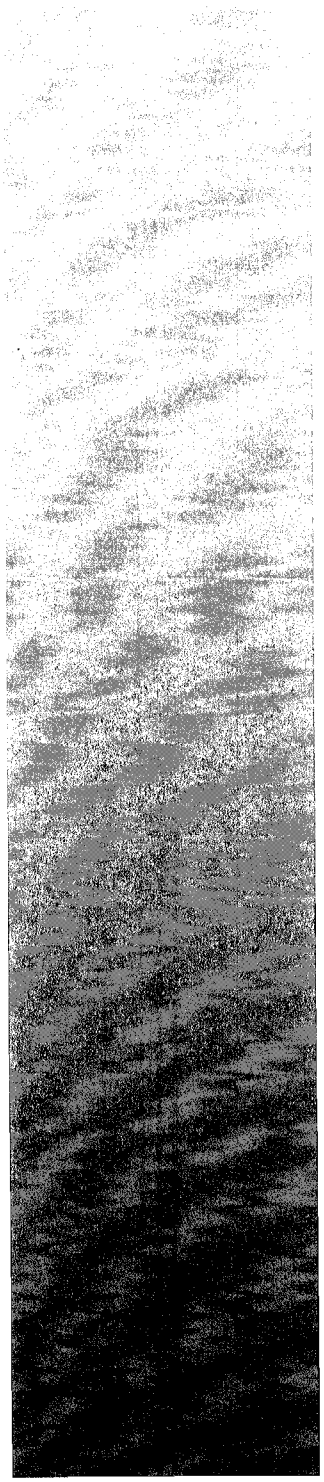
EXHIBIT 8

August 15, 2007

Appendix R

Preliminary Drainage Report

Established 1969



Preliminary Drainage Report

La`au Point Project at West Molokai, Hawaii

TMK: 5-1-02:Portion of 30

Prepared for:
Molokai Properties, Ltd.
745 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

WARREN S. UNEMORI
LICENSED PROFESSIONAL ENGINEER
NO. 1569-C
HAWAII, U.S.A.

Date: July 2006
Revised: November 2006
Revised: August 2007

WARREN S. UNEMORI ENGINEERING, INC.
Civil and Structural Engineers – Land Surveyors
Wells Street Professional Center – Suite 403
2145 Wells Street
Wailuku, Maui, Hawaii 96793

TABLE OF CONTENTS

Preliminary Drainage Report
for
La`au Point Project
West Molokai, Hawaii

I. INTRODUCTION

This preliminary drainage report has been prepared to examine both the existing drainage conditions and proposed drainage plan for subject development.

II. PROPOSED PROJECT

A. Site Location:

The project is located at the southwestern tip of Molokai on the north and easterly side of La`au Point. It is situated along the coastline between Kaluakoi Resort to the north and Hale Lono Harbor to the east (see Exhibit 1).

The petition area encompasses approximately 850 acres summarized as follows:

200 house lots	400± Acs.
Roadways	46± Acs.
Infrastructure	14± Acs.
Park	8± Acs.
Open Space	382± Acs.
Total =	850 Acs.±

B. Project Description:

The proposed plan is to create 200 rural residential lots ranging in size between approximately 1 and 3acres.

Proposed improvements include asphalt paved roadways, grassed drainage swales; storm, sewer and water systems; underground electrical, telephone and CATV distribution systems; and landscaping.

III. EXISTING CONDITIONS:

A. Topography and Soil Conditions:

The project site is undeveloped and was previously used for seasonal grazing. The site generally slopes in a mauka/makai direction. The cross slopes along the westerly strip of land between Kaluakoi and La`au Point varies between 3 to 7 percent, whereas the lands along the southerly boundary toward Hale Lono Harbor is a bit steeper with cross slopes ranging between 7 and 15 percent.

According to the *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii* [1], prepared by the United States Department of Agriculture, Soil Conservation Service, the soil classification found at the project site is predominantly KKTC Kapuhikani. These soils are geographically associated with Holomua and Molokai soils. This soil contains many stones on the surface and throughout its profile. Average depth to bedrock is estimated at 27 inches.

B. Drainage:

There are several drainageways that transect the project site in the mauka/makai directions. Current runoff in these drainageways for a 100 year 24 hour storm range between 29 and 1753 cfs. The present flow patterns in these channels will be maintained. Culverts will be sized to convey these flows across the roadways that generally run perpendicular to these natural drainageways.

C. Flood and Tsunami Zone:

According to Flood Insurance Map parcel number 150003 - 0025B dated June 1, 1981 prepared by FEMA, the project site is predominantly situated in Zone C which is described as areas subject to minimal flooding. Portions of project site located along the lower lying coastline are in A4 and high hazard V zones. However, none of the lots fall within these zones. However lots that extend into the high hazard V zone will be required to comply with the provisions of section 19.62.060, "Standards of Development," Subsection "G" in Title 19 of the Maui County Code.

IV. DRAINAGE PLAN

A. General:

The primary objective of the drainage plan is to minimize the impact on the downstream conservation land and coastal ecosystem by implementing the following practices and design criteria:

a. Maintain the present drainage patterns within the existing drainageways.

b. Confine the clearing, grubbing and grading to the road right-of-ways and areas needed for installation of the infrastructure.

c. Install storm drainage system to collect runoff from the roadway swales and run it through a surface or subsurface detention and desilting facilities before discharging the runoff into nearby drainageways.

d. To minimize disturbance of existing conditions, existing drainageways that transects the lots in a mauka-makai direction, may be undergrounded and subsurface or surface detention facilities

installed at the downstream end of such drainageways. In addition, the CC and R's will state that the existing flow patterns through/across lots shall be retained and maintained by the lot owner.

e. Require all lots to retain the additional runoff generated by the development of their lot in surface or subsurface retention facilities onsite.

f. Plant all disturbed areas with ground cover upon completion of the grading operation. Provide interim and/or permanent sprinkler systems to ensure continuous ground cover.

g. Initiate and maintain erosion control practices during and after completion of the project.

According to our calculations, the current peak runoff from the project site for a 50 year 1 hour duration storm is 512 cfs. Peak post development runoff from the developed lots and roadways is estimated at 623 cfs.

Surface and/or subsurface retention facilities will be sized to retain the difference in peak runoff in each lot. The runoff volume each lot must retain is approximately 365 ft^3 per lot.

B. Hydrologic Calculations:

The onsite hydrologic calculations are based on the "Rules for the Design of Storm Drainage Facilities in the County of Maui", Title MC-15, Chapter 4 and the "Rainfall Frequency Atlas of the Hawaiian Islands", Technical Paper No. 43, U. S. Department of Commerce, Weather Bureau:

Rational Formula used:

$$Q = CIA$$

Where Q = Rate of Flow (cfs)
C = Runoff Coefficient
I = Rainfall Intensity (inches/hour)
A = Area (Acres)

The offsite hydrologic calculations are based on procedures by the U.S. Department of Agriculture, Soil Conservation Service (SCS). This procedure is described in detail in the SCS National Engineering Handbook, Section 4, Hydrology (NEH-4). The 100-year inundation limits was determined by using the US Army Corps of Engineers HEC-RAS River Analysis System Version 2.2 software.

C. Conclusion:

The proposed development is not expected to have a significant adverse effect on the existing downstream properties. The anticipated increase in surface runoff from the paved roadway area will be directed into surface or subsurface detention and/or desilting facilities before being released into the nearby drainageways. Also, the increase in runoff from each developed lot will be retained onsite in surface or subsurface facilities. In addition, the contractor will be required to comply with State and County approved Best Management Practices for the duration of the construction period.

V. REFERENCES

1. *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. August 1972. United States Department of Agriculture, Soil Conservation Service.

2. *Flood Insurance Rate Map, Maui County, Hawaii*. Community-Panel Number 150003 00025 B, June 1, 1981 Federal Emergency Management Agency, Federal Insurance Administration.

3. *Rainfall Frequency Atlas of the Hawaiian Islands, Technical Paper No. 43*. 1962. U.S. Department of Commerce, Weather Bureau.

4. *Rules for the Design of Storm Drainage Facilities in the County of Maui.* July 1995. Department of Public Works and Waste Management, County of Maui.

EXHIBITS

1 Location Map

2 Site Specific Soil Classification Map

3 Flood Insurance Rate Map

4 Existing Drainage Map

5 Conceptual Drainage Master Plan

6 Subsurface Drainage System Detail

7 Riser Detail for Desilting Basin

8 Preliminary Grading Plan for Roadways

EXHIBIT 1
LOCATION MAP

0 15000 30000 45000 60000

SCALE: 1 IN. = 15,000 FT.

N

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

November 13, 2006

V:\Projdata\06proj\06021\dwg2004\exhibits\EXHIBIT-LOCMAP.dwg

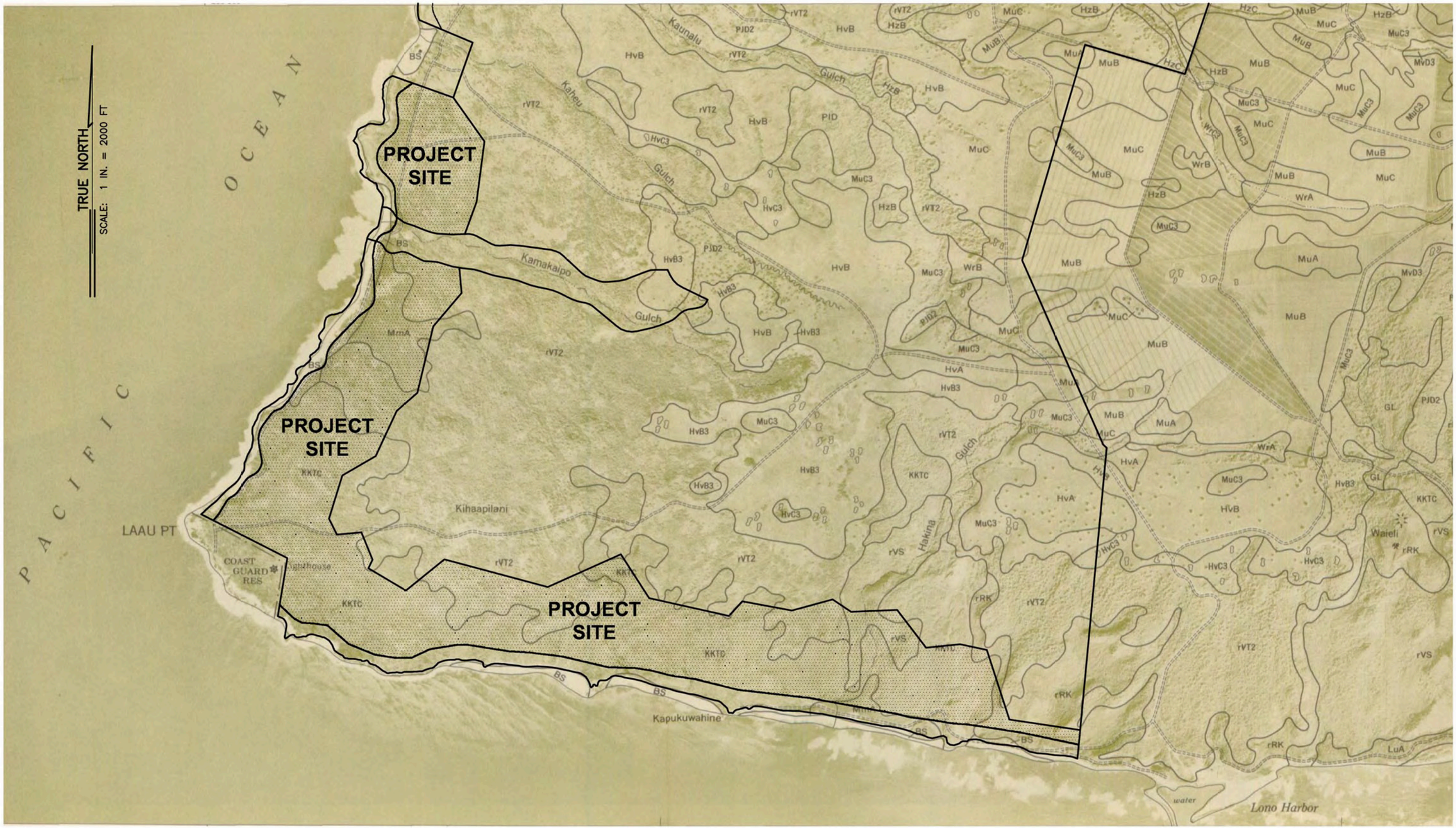


EXHIBIT 2
SITE SPECIFIC SOIL CLASSIFICATION MAP

0 2000. 4000 6000 8000

SCALE: 1 IN. = 2000 FT.

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June 11, 2006

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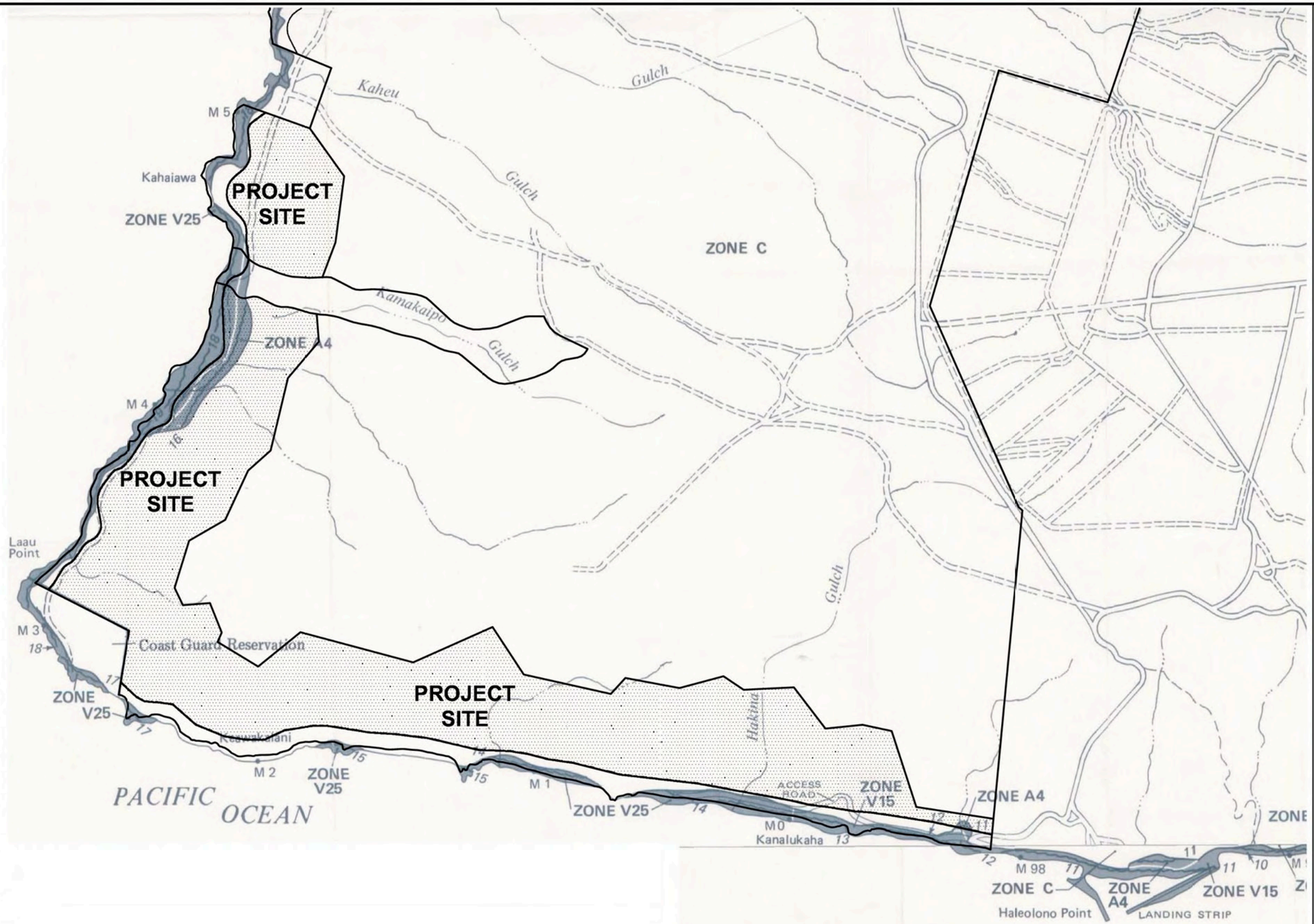

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MAUI COUNTY, HAWAII

PANEL 25 OF 395
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
150003 0025 B

EFFECTIVE DATE:
JUNE 1, 1981

federal emergency management agency
federal insurance administration

EXHIBIT 3
FLOOD INSURANCE RATE MAP

0 2000. 4000 6000 8000

SCALE: 1 IN. = 2000 FT.

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

June 11, 2006

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LEGEND:

NATURAL DRAINAGE GULLIES

EXISTING DRAINAGE PATTERN

EXHIBIT 4 - EXISTING DRAINAGE MAP

0 800 1600 2400 3200

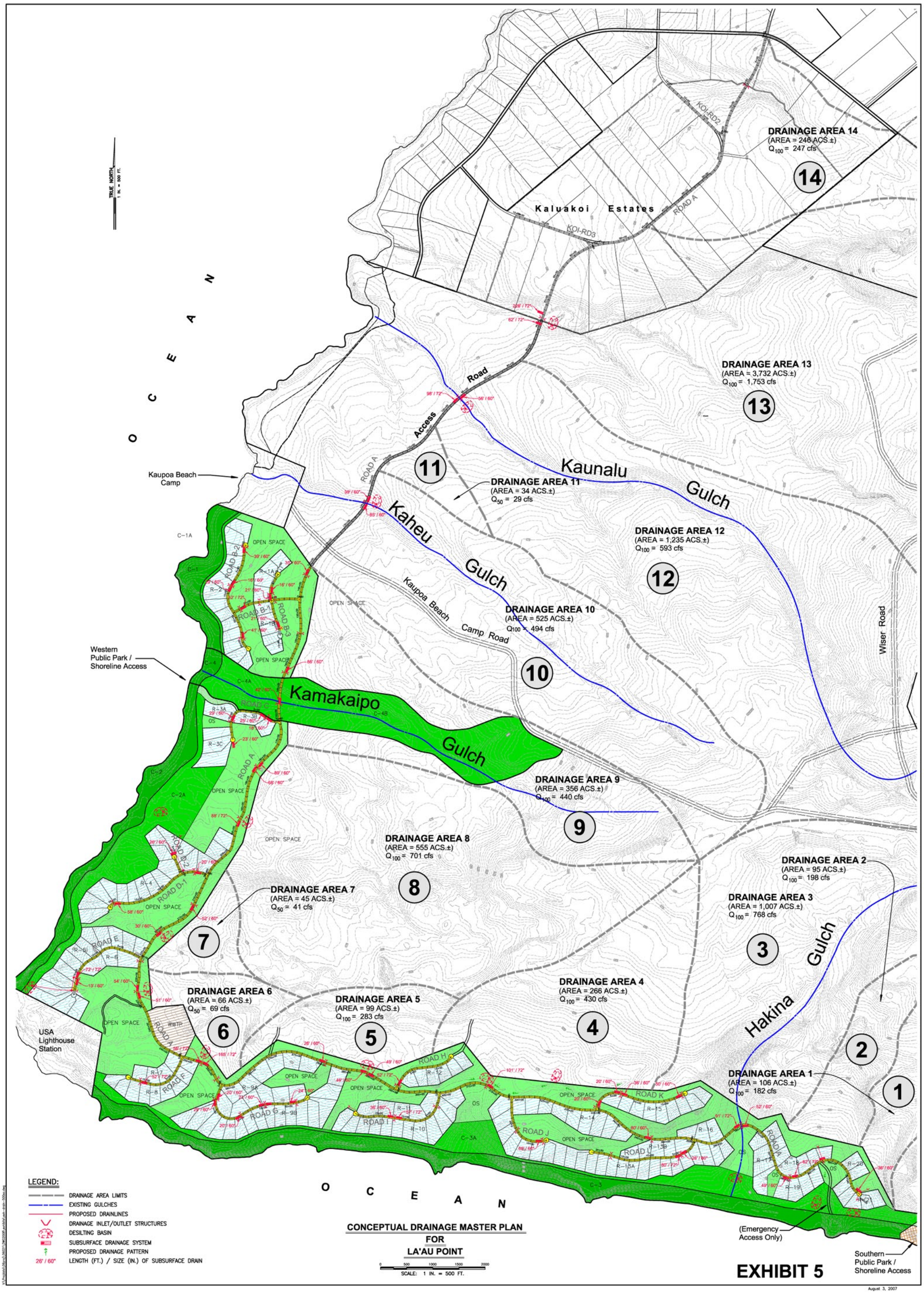
SCALE: 1 IN. = 800 FT.

LA'AU POINT

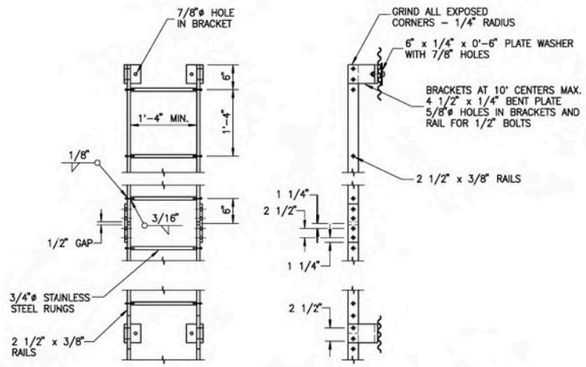
November 13, 2006

24"x36"

WSJE 06021


TRUE NORTH
1 IN. = 500 FT.
OCEAN
Kaluakoi Estates
KOI-RD2
KOI-RD3
ROAD A
DRAINAGE AREA 14
(AREA = 246 ACS.±)
Q100 = 247 cfs
14
Road
Access
DRAINAGE AREA 13
(AREA = 3,732 ACS.±)
Q100 = 1,753 cfs
13
Kaupoa Beach Camp
11
DRAINAGE AREA 11
(AREA = 34 ACS.±)
Q50 = 29 cfs
Kaunalu Gulch
Kaheu Gulch
DRAINAGE AREA 12
(AREA = 1,235 ACS.±)
Q100 = 593 cfs
12
Kaupoa Beach Camp Road
DRAINAGE AREA 10
(AREA = 525 ACS.±)
Q100 = 494 cfs
10
Wiser Road
Western Public Park / Shoreline Access
Kamakaipo Gulch
DRAINAGE AREA 9
(AREA = 356 ACS.±)
Q100 = 440 cfs
9
DRAINAGE AREA 8
(AREA = 555 ACS.±)
Q100 = 701 cfs
8
DRAINAGE AREA 2
(AREA = 95 ACS.±)
Q100 = 198 cfs
DRAINAGE AREA 3
(AREA = 1,007 ACS.±)
Q100 = 768 cfs
3
Hakina Gulch
DRAINAGE AREA 7
(AREA = 45 ACS.±)
Q50 = 41 cfs
7
DRAINAGE AREA 4
(AREA = 266 ACS.±)
Q100 = 430 cfs
4
DRAINAGE AREA 6
(AREA = 66 ACS.±)
Q50 = 69 cfs
6
DRAINAGE AREA 5
(AREA = 99 ACS.±)
Q100 = 283 cfs
5
2
DRAINAGE AREA 1
(AREA = 106 ACS.±)
Q100 = 182 cfs
1
USA Lighthouse Station
WWTP
OPEN SPACE
ROAD B-1
ROAD B-2
ROAD B-3
ROAD C
ROAD D-1
ROAD D-2
ROAD E
ROAD F
ROAD G
ROAD H
ROAD I
ROAD J
ROAD K
ROAD L
C-1
C-1A
C-2
C-2A
C-3
C-3A
C-4
C-4A
C-4B
R-1
R-1A
R-1B
R-2
R-3A
R-3B
R-3C
R-4
R-5
R-6
R-7
R-8
R-9A
R-9B
R-10
R-11
R-12
R-13B
R-14
R-15
R-15A
R-16
R-17
R-18
R-19
R-20
OS
(Emergency Access Only)
Southern Public Park / Shoreline Access
LEGEND:
DRAINAGE AREA LIMITS
EXISTING GULCHES
PROPOSED DRAINLINES
DRAINAGE INLET/OUTLET STRUCTURES
DESILTING BASIN
SUBSURFACE DRAINAGE SYSTEM
PROPOSED DRAINAGE PATTERN
26' / 60" LENGTH (FT.) / SIZE (IN.) OF SUBSURFACE DRAIN
CONCEPTUAL DRAINAGE MASTER PLAN
FOR
LA'AU POINT
0 500 1000 1500 2000
SCALE: 1 IN. = 500 FT.
EXHIBIT 5
August 3, 2007

SPLICE PLATE 2 1/2" x 3/8" x 0'-10"



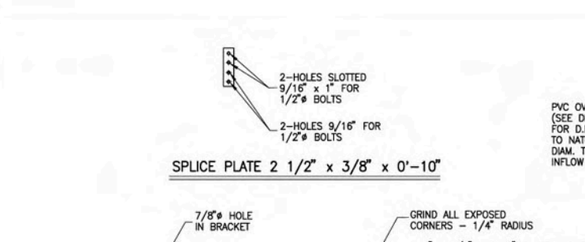
DETAIL - STAINLESS STEEL LADDER FOR CAP MANHOLE

NOT TO SCALE

details/drain/copymh002.dwg

NOTE:

1. LADDER SPLICE PLATE TO BE CONNECTED WITH 1/2"ø BOLTS WITH DOUBLE NUTS.
2. THE DISTANCE BETWEEN STEPS SHALL NOT EXCEED 16 INCHES AND SHALL BE UNIFORM THROUGHOUT THE LENGTH OF THE WALL. PLACE LADDER IN THE WALL WITHOUT AN OPENING.



SECTION "B"-"B"

DETAIL - BAFFLE FOR 72" SUBSURFACE DRAINLINE

NOT TO SCALE

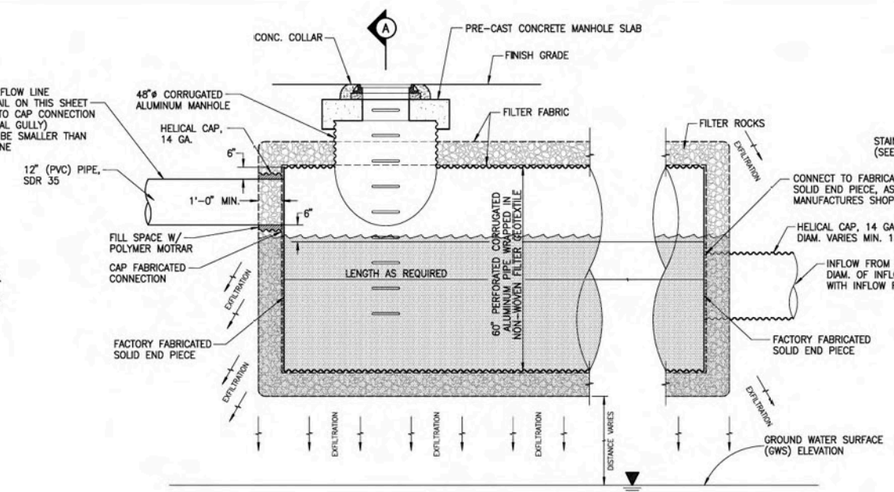
m:/projects/84024/baffle01.dwg

INSET

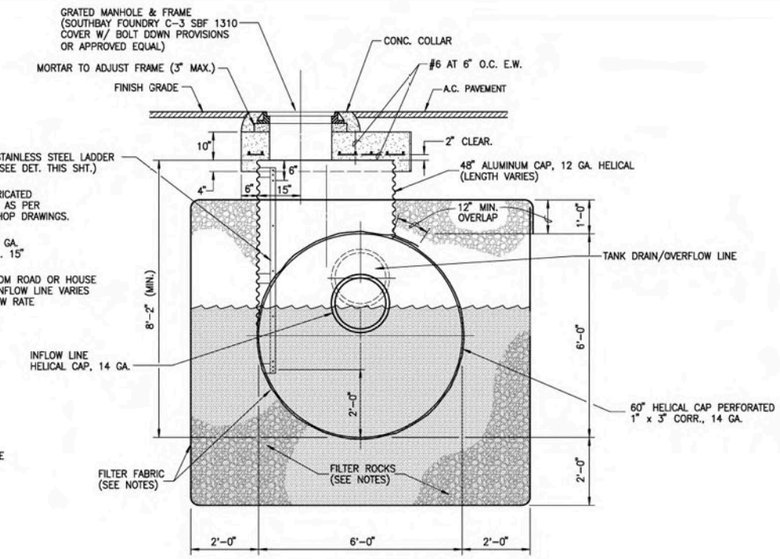
NOT TO SCALE

NOTE:

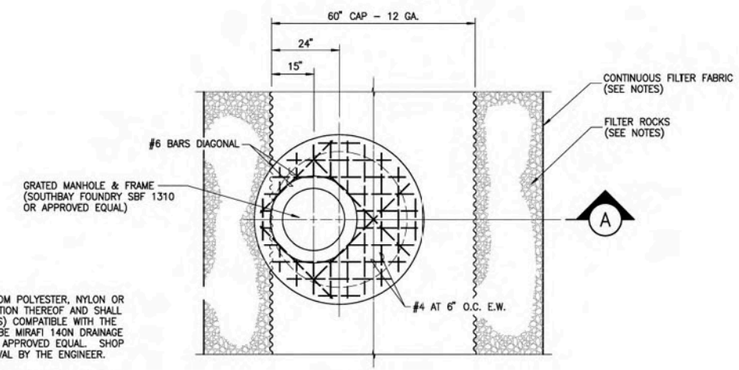
ALL NUTS & BOLTS USED TO FASTEN DRAINLINE BAFFLE SHALL BE MADE OF ALUMINUM



LONGITUDINAL SECTION



SECTION (A)



PLAN

NOTES:

1. FILTER FABRIC:
   FILTER FABRIC SHALL BE MANUFACTURED FROM POLYESTER, NYLON OR POLYPROPYLENE MATERIAL, OR ANY COMBINATION THEREOF AND SHALL POSSESS AN EQUIVALENT OPENING SIZE (EOS) COMPATIBLE WITH THE ADJACENT MATERIAL. FILTER FABRIC SHALL BE MIRAFI 140N DRAINAGE FABRIC, MANUFACTURED BY MIRAFI, INC., OR APPROVED EQUAL. SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER.
2. FILTER ROCK:
   FILTER ROCK SHALL BE ASTM NO. 4 CRUSHED ROCK GRADATION AND SHALL CONFORM TO SECTION 15 OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER, 1986 AND ALL AMENDMENTS MADE THEREOF BY THE CONTRACT DOCUMENTS.

DETAIL - 72" OR 60" SUBSURFACE DRAINLINE W/ CAP MANHOLE ALONG ROADWAYS

DETAIL - 60" SUBSURFACE DRAINLINE W/ CAP MANHOLE FOR SUBDIVIDED LOTS (LENGTHS TO BE DETERMINED)

NOT TO SCALE

details/drain/copymh002.dwg

THE FOLLOWING DETAILS AS SHOWN ON "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984", SHALL BE CONSIDERED PART OF THE CONSTRUCTION DRAWINGS.

PLATE	CONTENTS
D-22	PRE-CAST CONCRETE DRAIN MANHOLE
D-23	PRE-CAST CONCRETE DRAIN MANHOLE DETAILS
D-24	PRE-CAST CONCRETE DRAIN MANHOLE DETAILS
D-25	PRE-CAST CONCRETE DRAIN MANHOLE DETAILS
D-26	CHANNELIZING DETAILS FOR DRAIN MANHOLE
D-27	RUNGS FOR CATCH BASINS AND MANHOLES
D-28	TYPE "DA" FRAME FOR CATCH BASIN AND MANHOLE
D-30	CATCH BASIN AND MANHOLE COVER
D-31	PAYMENT TRENCH WIDTH AND REPAVING FOR DRAIN PIPES

EXHIBIT 6

LETTER	DESCRIPTION	DATE

WARREN S. UNEMORI LICENSED PROFESSIONAL ENGINEER NO. 1569-C HAWAII, U.S.A.

SIGNATURE DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-2 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

LA'AU POINT RURAL SUBDIVISION

MAUNALOA, MOLOKAI, HAWAII

TITLE SUBSURFACE DRAINAGE SYSTEM DETAILS

DESIGNED BY: WSU	CHECKED BY: RMA	JOB NUMBER: 06021	SHEET: XX
DRAWN BY: WIS	APPROVED BY: WSU		
SCALE: AS NOTED		DATE: 6-28-07	OF SHEETS

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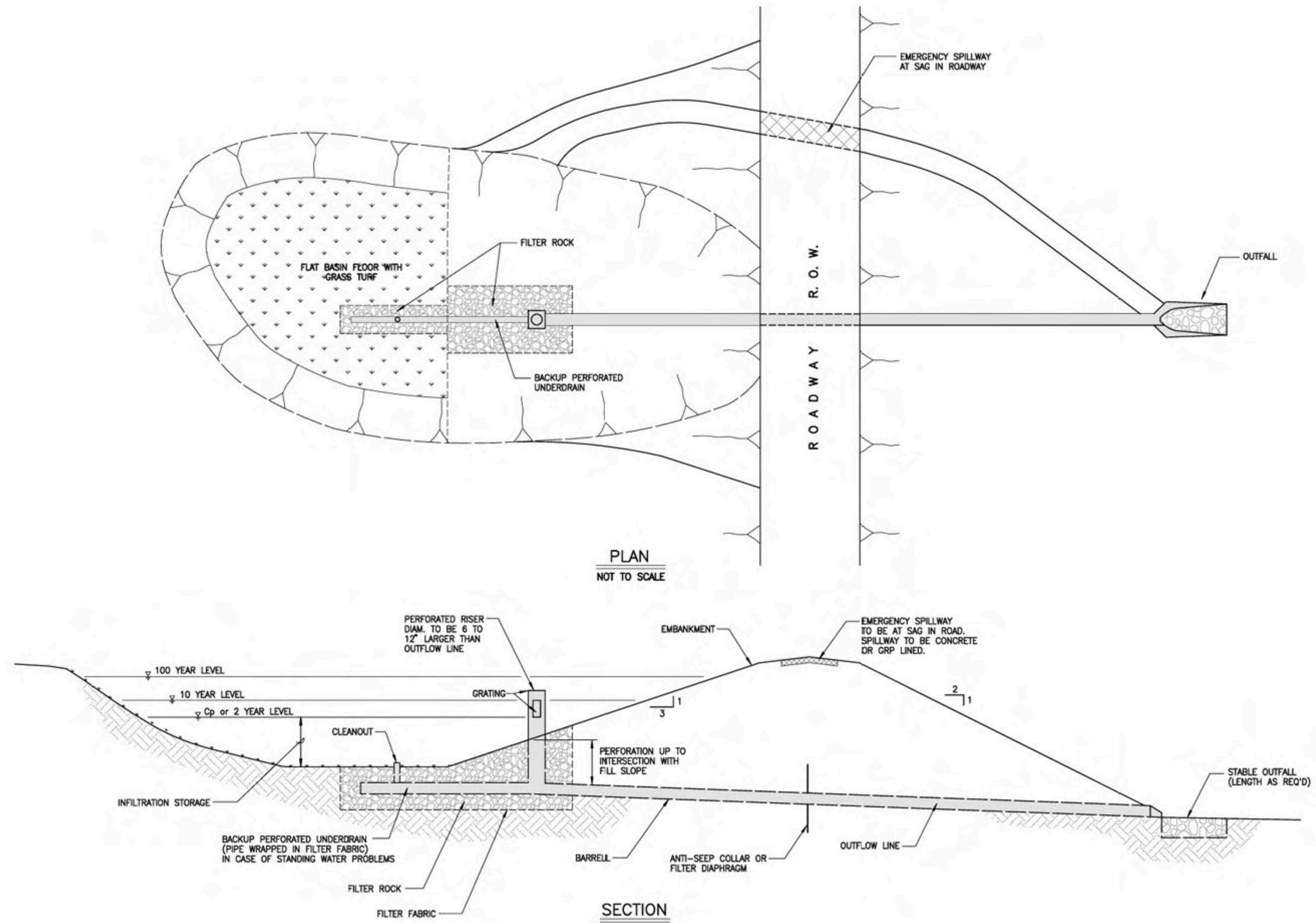

DETAIL – INFILTRATION BASIN

NOT TO SCALE

EXHIBIT 7

WARREN S. UNEMORI LICENSED PROFESSIONAL ENGINEER NO. 1569-C HAWAII, U.S.A.

SIGNATURE DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-2 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

LĀ'AU POINT RURAL SUBDIVISION

MAUNALOA, MOLOKAI, HAWAII

TITLE RISER DETAIL FOR DESILTING BASIN

WSU DESIGNED BY	RMA CHECKED BY	06021 JOB NUMBER	XX SHEET
WIS DRAWN BY	WSU APPROVED BY	6-28-07 DATE	OF SHEETS
AS NOTED SCALE			

LETTER	DESCRIPTION	DATE

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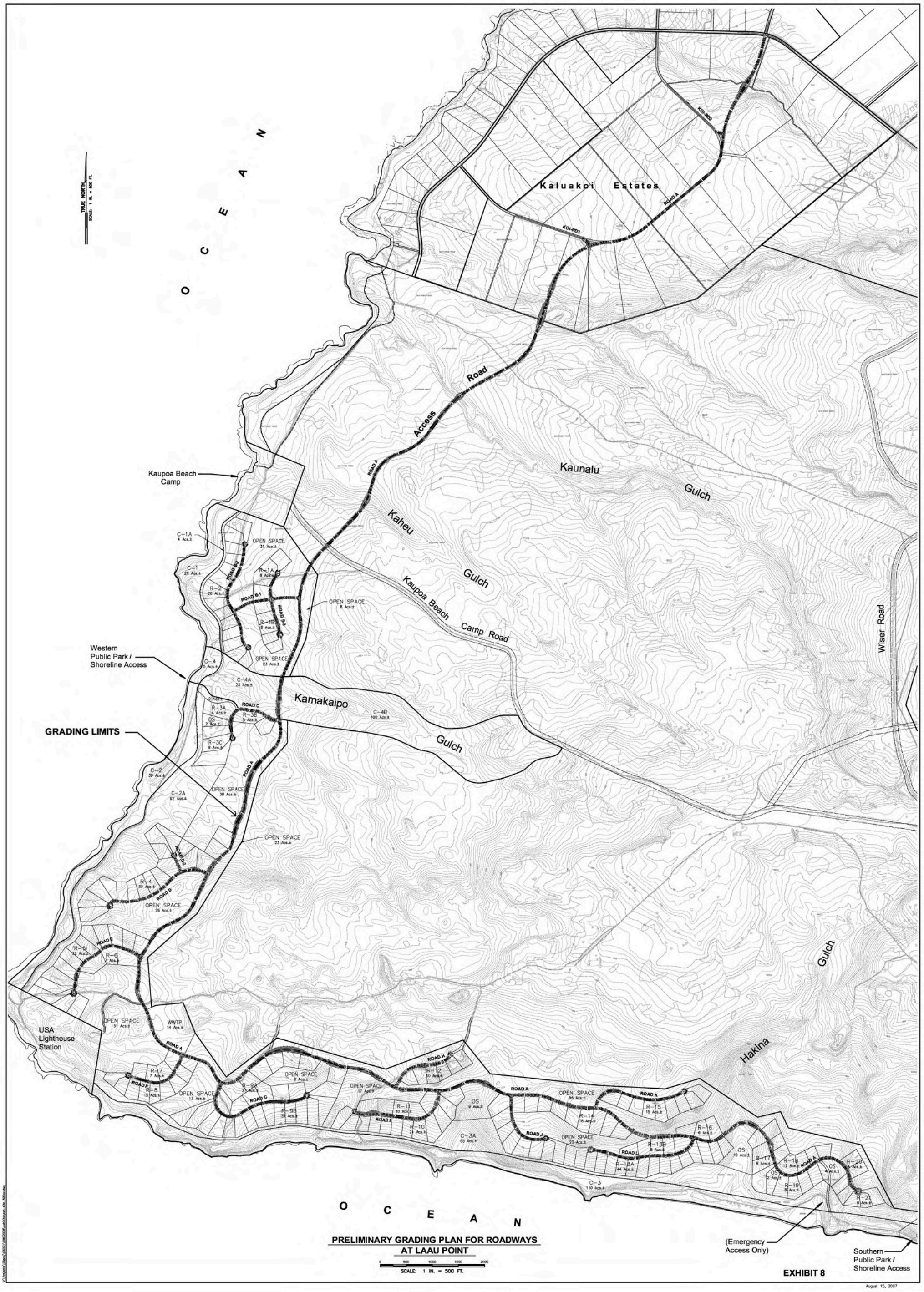

PRELIMINARY GRADING PLAN FOR ROADWAYS AT LAAU POINT

0 500 1000 1500 2000

SCALE: 1 IN. = 500 FT.

EXHIBIT 8

August 15, 2007

APPENDIX A

HYDROLOGIC CALCULATIONS

LAAU POINT SUBDIVISION
POST-DEVELOPMENT DRAINAGE CALCULATIONS
Project Site Surface Runoff (50 Yr. - 1 Hr. = 2.4 Inches)

Lot #	Area (acs)	Longest Run (ft)	Elevation Change (ft)	Percent Slope	Number of Sublots	Roof Area (acs)	Heavy Soil Area (acs)	Heavy Soil C coeff	Weighted C coeff	T_c (min)	I coeff	Q value (cfs)	Storage Volume (c.f.)
R-1a	8	400	10	2.50%	5	0.57	7.43	0.22	0.27	21.0	3.90	8.50	16062
R-1b	8	400	12	3.00%	5	0.57	7.43	0.22	0.27	20.0	3.95	8.61	15493
R-2	26	580	17	2.93%	14	1.61	24.39	0.22	0.27	23.5	3.70	25.51	53943
R-3a	13	580	4	0.69%	4	0.46	12.54	0.22	0.25	32.0	3.30	10.54	30367
R-3b	5	450	23	5.11%	2	0.23	4.77	0.22	0.25	19.5	3.95	5.01	8787
R-4	39	950	54	5.68%	18	2.07	36.93	0.35	0.38	25.0	3.70	55.09	123958
R-5	32	750	30	4.00%	14	1.61	30.39	0.35	0.38	25.0	3.70	45.01	101268
R-6	7	910	34	3.74%	3	0.34	6.66	0.35	0.38	28.0	3.50	9.30	23432
R-7	7	775	42	5.42%	4	0.46	6.54	0.22	0.27	23.5	3.70	6.94	14675
R-8	15	980	43	4.39%	9	1.03	13.97	0.22	0.27	30.0	3.35	13.58	36671
R-9a	27	1080	61	5.65%	12	1.38	25.62	0.35	0.38	26.0	3.60	37.00	86570
R-9b	37	450	23	5.11%	16	1.84	35.16	0.35	0.38	19.5	3.95	55.51	97413
R-10	24	775	62	8.00%	12	1.38	22.62	0.22	0.26	21.5	3.85	24.20	46827
R-11	10	510	42	8.24%	5	0.57	9.43	0.22	0.26	18.0	4.10	10.74	17396
R-12	10	340	24	7.06%	6	0.69	9.31	0.22	0.27	16.0	4.30	11.62	16736

R-13a	44	640	60	9.38%	24	2.76	41.24	0.35	0.39	19.0	4.00	68.21	116643
R-13b	8	420	32	7.62%	5	0.57	7.43	0.35	0.39	17.5	4.15	13.05	20553
R-14	18	440	23	5.23%	9	1.03	16.97	0.35	0.38	17.5	4.15	28.72	45230
R-15	15	510	29	5.69%	9	1.03	13.97	0.35	0.39	20.0	3.95	23.19	41735
R-16	6	450	38	8.44%	3	0.34	5.66	0.35	0.38	17.0	4.20	9.69	14822
R-17	19	690	38	5.51%	9	1.03	17.97	0.22	0.26	22.0	3.80	18.75	37125
R-18	12	365	35	9.59%	7	0.80	11.20	0.35	0.39	15.5	4.40	20.60	28739
R-19	4	570	50	8.77%	2	0.23	3.77	0.22	0.26	19.0	4.00	4.19	7166
R-20	7	520	46	8.85%	4	0.46	6.54	0.22	0.27	18.0	4.10	7.69	12455
TOTAL	401				201							521	1014064

LAAU POINT SUBDIVISION
PRE-DEVELOPMENT DRAINAGE CALCULATIONS

Project Site Surface Runoff (50 Yr. - 1 Hr. = 2.4 Inches)

Lot #	Area (Acres)	Longest Run (ft)	Elevation Change (ft)	Percent Slope	C coeff	T_c (min)	I coeff	Q value (cfs)	Storage Volume (c.f.)
R-1a	8	400	10	2.50%	0.22	21.0	3.90	6.86	12973
R-1b	8	400	12	3.00%	0.22	20.0	3.95	6.95	12514
R-2	26	580	17	2.93%	0.22	23.5	3.70	21.16	44762
R-3a	13	580	4	0.69%	0.22	32.0	3.30	9.44	27181
R-3b	5	450	23	5.11%	0.22	19.5	3.95	4.35	7625
R-4	39	950	54	5.68%	0.35	25.0	3.70	50.51	113636
R-5	32	750	30	4.00%	0.35	25.0	3.70	41.44	93240
R-6	7	910	34	3.74%	0.35	28.0	3.50	8.58	21609
R-7	7	775	42	5.42%	0.22	23.5	3.70	5.70	12051
R-8	15	980	43	4.39%	0.22	30.0	3.35	11.06	29849
R-9a	27	1080	61	5.65%	0.35	26.0	3.60	34.02	79607
R-9b	37	450	23	5.11%	0.35	19.5	3.95	51.15	89773
R-10	24	775	62	8.00%	0.22	21.5	3.85	20.33	39335
R-11	10	510	42	8.24%	0.22	18.0	4.10	9.02	14612
R-12	10	340	24	7.06%	0.22	16.0	4.30	9.46	13622

R-13a	44	640	60	9.38%	0.35	19.0	4.00	61.60	105336
R-13b	8	420	32	7.62%	0.35	17.5	4.15	11.62	18302
R-14	18	440	23	5.23%	0.35	17.5	4.15	26.15	41178
R-15	15	510	29	5.69%	0.35	20.0	3.95	20.74	37328
R-16	6	450	38	8.44%	0.35	17.0	4.20	8.82	13495
R-17	19	690	38	5.51%	0.22	22.0	3.80	15.88	31450
R-18	12	365	35	9.59%	0.35	15.5	4.40	18.48	25780
R-19	4	570	50	8.77%	0.22	19.0	4.00	3.52	6019
R-20	7	520	46	8.85%	0.22	18.0	4.10	6.31	10229
TOTAL	401							463	901505

LA'AU POINT SUBDIVISION
PRE/POST DEVELOPMENT ROADWAY DRAINAGE CALCULATIONS
Project Site Surface Runnoff (50 Yr. - 1 Hr. = 2.4 Inches)

Drainage Area	Area (Sq. Ft.)	Total Area (acres)	Pre-Devleopment Runoff Coefficient	Post-Devleopment Runoff Coefficient	Length (ft.)	Elevation Difference (ft.)	Average Slope	Time of Conc. (Min.)	Rainfall Intestity (50yr.-1hr.) (in./hr.)	Q Pre-Development (50yr.-1hr.) (cfs)	Q Post-Development (50yr-1hr) (cfs)	ΔQ (Net Increase)	Volume Increase (Sq. Ft.)
1	23487	0.539	0.35	0.68	500	29	5.80%	20	4	0.75	1.47	0.71	1281
2	82232	1.888	0.35	0.68	1300	37	2.85%	34	3.2	2.11	4.11	1.99	6100
3	18044	0.414	0.35	0.68	350	28	8.00%	16	4.4	0.64	1.24	0.60	866
4	148893	3.418	0.35	0.68	4350	175	4.02%	75	2.2	2.63	5.11	2.48	16750
5	134582	3.090	0.35	0.68	1810	44	2.43%	36	3.15	3.41	6.62	3.21	10406
6	28381	0.652	0.28	0.65	625	14	2.24%	25	3.7	0.67	1.57	0.89	2007
7	48170	1.106	0.35	0.68	1100	44	4.00%	28	3.5	1.35	2.63	1.28	3219
8	139869	3.211	0.35	0.68	2100	83	3.95%	35	3.2	3.60	6.99	3.39	10681
9	78926	1.812	0.35	0.68	1800	77	4.28%	33	3.25	2.06	4.00	1.94	5771
10	16821	0.386	0.35	0.68	300	16	5.33%	15.5	4.35	0.59	1.14	0.55	773
11	36123	0.829	0.28	0.65	640	31	4.84%	21.5	3.85	0.89	2.08	1.18	2286
12	72080	1.655	0.28	0.65	1125	56	4.98%	27.5	3.5	1.62	3.76	2.14	5304
13	40519	0.930	0.28	0.65	720	33	4.58%	23	3.8	0.99	2.30	1.31	2707
14	60219	1.382	0.35	0.68	1950	84	4.31%	35	3.2	1.55	3.01	1.46	4599
15	25920	0.595	0.35	0.68	450	7	1.56%	23	3.8	0.79	1.54	0.75	1545
16	46741	1.073	0.35	0.68	840	8	0.95%	33	3.25	1.22	2.37	1.15	3418
17	86412	1.984	0.35	0.68	1800	39	2.17%	36	3.15	2.19	4.25	2.06	6681
18	75455	1.732	0.35	0.68	1900	58	3.05%	37.5	3.1	1.88	3.65	1.77	5981

19	49931	1.146	0.35	0.68	800	26	3.25%	28.5	3.45	1.38	2.69	1.31	3347
20	85111	1.954	0.35	0.68	1700	69	4.06%	34	3.2	2.19	4.25	2.06	6314
21	13457	0.309	0.35	0.68	160	7	4.38%	13	4.7	0.51	0.99	0.48	561
22	18180	0.417	0.35	0.68	240	6	2.50%	17	4.25	0.62	1.21	0.59	896
23	33186	0.762	0.35	0.68	575	19	3.30%	22.5	3.8	1.01	1.97	0.96	1935
24	41618	0.955	0.28	0.65	633	41	6.48%	21	3.85	1.03	2.39	1.36	2572
25	32881	0.755	0.28	0.65	980	61	6.22%	25	3.7	0.78	1.82	1.03	2325
26	41575	0.954	0.35	0.68	820	54	6.59%	23	3.8	1.27	2.47	1.20	2477
27	72489	1.664	0.28	0.65	1650	86	5.21%	31.5	3.3	1.54	3.57	2.03	5760
28	65685	1.508	0.28	0.65	950	30	3.16%	30.5	3.35	1.41	3.28	1.87	5131
29	22491	0.516	0.28	0.65	350	18	5.14%	17	4.25	0.61	1.43	0.81	1242
30	42142	0.967	0.28	0.65	590	27	4.58%	21	3.85	1.04	2.42	1.38	2605
31	92097	2.114	0.28	0.65	2050	55	2.68%	37	3.1	1.84	4.26	2.43	8075
32	17595	0.404	0.28	0.65	290	11	3.79%	16.5	4.3	0.49	1.13	0.64	954
33	22984	0.528	0.28	0.65	350	2	0.57%	27	3.5	0.52	1.20	0.68	1660
34	75894	1.742	0.28	0.65	1950	54	2.77%	37	3.1	1.51	3.51	2.00	6655
35	72813	1.672	0.28	0.65	2100	56	2.67%	37.5	3.1	1.45	3.37	1.92	6471
36	30760	0.706	0.28	0.65	660	11	1.67%	28	3.5	0.69	1.61	0.91	2304
37	12864	0.295	0.28	0.65	200	3	1.50%	17.5	4.25	0.35	0.82	0.46	731
TOTAL	2006627	46.066								49.2	102.2	53.0	152390

APPENDIX B

TR-20 / TR-55 OFFSITE DRAINAGE CALCULATIONS

LAAU POINT SUBDIVISION
OFFSITE DRAINAGE CALCULATIONS (EXISTING)

Project Site Surface Runoff (100 Yr. - 24 Hr. = 8.2 Inches)
Project Site Surface Runoff (50 Yr. - 1 Hr. = 2.45 Inches)

Drainage Area	Area (Acres)	Area (Soil Group B) (acs.)	Area (Soil Group C) (acs.)	Area (Soil Group D) (acs.)	Curve Number	Runoff Coefficient	Longest Run (ft)	Elevation Change (ft)	Percent Slope	Tc (min.)	Intensity	Peak Runoff (cfs)	Comments
1	105.68	37.76	56.33	11.59	75.98	n/a	5165	295	5.71%	56	n/a	182	100-yr 24-hr Storm
2	95.44	35.65	12.48	47.30	77.74	n/a	4520	298	6.59%	44	n/a	198	100-yr 24-hr Storm
3	1007.48	739.08	194.61	73.78	72.03	n/a	15330	622	4.06%	177	n/a	768	100-yr 24-hr Storm
4	266.42	99.30	129.40	37.72	75.98	n/a	5230	243	4.65%	62	n/a	430	100-yr 24-hr Storm
5	99.22	0.00	91.41	7.81	79.39	n/a	2290	130	5.68%	25	n/a	283	100-yr 24-hr Storm
6	66.09	n/a	n/a	n/a	n/a	0.32	2120	143	6.75%	36	3.25	69	50-yr 1-hr Storm
7	45.12	n/a	n/a	n/a	n/a	0.32	2400	70	2.92%	48	2.85	41	50-yr 1-hr Storm
8	554.75	6.05	513.37	35.33	79.21	n/a	9908	371	3.74%	105	n/a	701	100-yr 24-hr Storm
9	355.60	71.81	283.79	0.00	76.98	n/a	8936	355	3.97%	101	n/a	440	100-yr 24-hr Storm
10	524.85	294.23	230.62	0.00	73.39	n/a	10030	342	3.41%	132	n/a	494	100-yr 24-hr Storm
11	34.07	n/a	n/a	n/a	n/a	0.30	2350	72	3.06%	47	2.8	29	50-yr 1-hr Storm
12	1235.36	1105.78	129.59	0.00	70.05	n/a	21085	623	2.95%	282	n/a	593	100-yr 24-hr Storm
13	3731.65	3561.62	170.04	0.00	69.46	n/a	30260	1183	3.91%	333	n/a	1753	100-yr 24-hr Storm
14	246.23	172.77	73.46	0.00	71.98	n/a	8536	325	3.81%	114	n/a	247	100-yr 24-hr Storm

Date: August 2007

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	47.016		10.5000	182.33		
POND 10	IN	POND	100	47.016		10.5000	182.33		
POND 10	OUT	POND	100	47.016		10.5000	182.33		
SUBAREA 10		AREA	100	47.016		10.5000	182.33		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = .9327 hrs
Drainage Area = 105.680 acres Runoff CN= 76

==========
Computational Time Increment = .05182 hrs
Computed Peak Time = 10.5185 hrs
Computed Peak Flow = 182.38 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 10.5000 hrs
Peak Flow, Interpolated Output = 182.33 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 76
Area = 105.680 acres
S = 3.1579 in
0.2S = .6316 in

Cumulative Runoff

5.3402 in
47.030 ac-ft

HYG Volume... 47.016 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .93270 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .05182 hrs = 0.08333 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 128.38 cfs
Unit peak time Tp = .62178 hrs
Unit receding limb, Tr = 2.48713 hrs
Total unit time, Tb = 3.10891 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	44.349		10.3500	198.48		
POND 10	IN	POND	100	44.349		10.3500	198.48		
POND 10	OUT	POND	100	44.349		10.3500	198.48		
SUBAREA 10		AREA	100	44.349		10.3500	198.48		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = .7388 hrs
Drainage Area = 95.440 acres Runoff CN= 78

==========
Computational Time Increment = .04925 hrs
Computed Peak Time = 10.3434 hrs
Computed Peak Flow = 198.65 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 10.3500 hrs
Peak Flow, Interpolated Output = 198.48 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 78
Area = 95.440 acres
S = 2.8205 in
0.2S = .5641 in

Cumulative Runoff

5.5762 in
44.349 ac-ft

HYG Volume... 44.349 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .73883 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .04925 hrs = 0.10000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 146.37 cfs
Unit peak time Tp = .49254 hrs
Unit receding limb, Tr = 1.97017 hrs
Total unit time, Tb = 2.46271 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	408.903		12.0500	768.09		
POND 10	IN	POND	100	408.903		12.0500	768.09		
POND 10	OUT	POND	100	408.903		12.0500	768.09		
SUBAREA 10		AREA	100	408.903		12.0500	768.09		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = 2.9462 hrs
Drainage Area = 1007.480 acres Runoff CN= 72

==========
Computational Time Increment = .05036 hrs
Computed Peak Time = 12.0362 hrs
Computed Peak Flow = 768.21 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 768.09 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 72
Area = 1007.480 acres
S = 3.8889 in
0.2S = .7778 in

Cumulative Runoff

4.8704 in
408.901 ac-ft

HYG Volume... 408.903 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 2.94617 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .05036 hrs = 0.02564 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 387.47 cfs
Unit peak time Tp = 1.96406 hrs
Unit receding limb, Tr = 7.85625 hrs
Total unit time, Tb = 9.82032 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	118.545		10.6000	430.04		
POND 10	IN	POND	100	118.545		10.6000	430.04		
POND 10	OUT	POND	100	118.545		10.6000	430.04		
SUBAREA 10		AREA	100	118.545		10.6000	430.04		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = 1.0412 hrs
Drainage Area = 266.420 acres Runoff CN= 76

==========
Computational Time Increment = .04958 hrs
Computed Peak Time = 10.5606 hrs
Computed Peak Flow = 430.68 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 10.6000 hrs
Peak Flow, Interpolated Output = 430.04 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 76
Area = 266.420 acres
S = 3.1579 in
0.2S = .6316 in

Cumulative Runoff

5.3402 in
118.562 ac-ft

HYG Volume... 118.545 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 1.04121 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .04958 hrs = 0.07143 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 289.92 cfs
Unit peak time Tp = .69412 hrs
Unit receding limb, Tr = 2.77650 hrs
Total unit time, Tb = 3.47062 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	47.058		10.1500	283.48		
POND 10	IN	POND	100	47.058		10.1500	283.48		
POND 10	OUT	POND	100	47.058		10.1500	283.48		
SUBAREA 10		AREA	100	47.058		10.1500	283.48		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = .4192 hrs
Drainage Area = 99.220 acres Runoff CN= 79

==========
Computational Time Increment = .04658 hrs
Computed Peak Time = 10.1548 hrs
Computed Peak Flow = 283.70 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 10.1500 hrs
Peak Flow, Interpolated Output = 283.48 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 79
Area = 99.220 acres
S = 2.6582 in
0.2S = .5316 in

Cumulative Runoff

5.6944 in
47.083 ac-ft

HYG Volume... 47.058 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .41924 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .04658 hrs = 0.16667 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 268.16 cfs
Unit peak time Tp = .27949 hrs
Unit receding limb, Tr = 1.11795 hrs
Total unit time, Tb = 1.39744 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	263.248		11.1000	700.71		
POND 10	IN	POND	100	263.248		11.1000	700.71		
POND 10	OUT	POND	100	263.248		11.1000	700.71		
SUBAREA 10		AREA	100	263.248		11.1000	700.71		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = 1.7573 hrs
Drainage Area = 554.750 acres Runoff CN= 79

==========
Computational Time Increment = .05093 hrs
Computed Peak Time = 11.1037 hrs
Computed Peak Flow = 700.78 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 11.1000 hrs
Peak Flow, Interpolated Output = 700.71 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 79
Area = 554.750 acres
S = 2.6582 in
0.2S = .5316 in

Cumulative Runoff

5.6944 in
263.247 ac-ft

HYG Volume... 263.248 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 1.75728 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .05093 hrs = 0.04348 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 357.70 cfs
Unit peak time Tp = 1.17149 hrs
Unit receding limb, Tr = 4.68596 hrs
Total unit time, Tb = 5.85745 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	161.741		11.0500	440.48		
POND 10	IN	POND	100	161.741		11.0500	440.48		
POND 10	OUT	POND	100	161.741		11.0500	440.48		
SUBAREA 10		AREA	100	161.741		11.0500	440.48		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = 1.6797 hrs
Drainage Area = 355.600 acres Runoff CN= 77

==========
Computational Time Increment = .05090 hrs
Computed Peak Time = 11.0450 hrs
Computed Peak Flow = 440.59 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 11.0500 hrs
Peak Flow, Interpolated Output = 440.48 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 77
Area = 355.600 acres
S = 2.9870 in
0.2S = .5974 in

Cumulative Runoff

5.4581 in
161.743 ac-ft

HYG Volume... 161.741 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 1.67969 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .05090 hrs = 0.04545 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 239.88 cfs
Unit peak time Tp = 1.11977 hrs
Unit receding limb, Tr = 4.47906 hrs
Total unit time, Tb = 5.59883 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	218.216		11.4500	494.20		
POND 10	IN	POND	100	218.216		11.4500	494.20		
POND 10	OUT	POND	100	218.216		11.4500	494.20		
SUBAREA 10		AREA	100	218.216		11.4500	494.20		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = 2.2044 hrs
Drainage Area = 525.000 acres Runoff CN= 73

==========
Computational Time Increment = .05068 hrs
Computed Peak Time = 11.4526 hrs
Computed Peak Flow = 494.25 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 11.4500 hrs
Peak Flow, Interpolated Output = 494.20 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 73
Area = 525.000 acres
S = 3.6986 in
0.2S = .7397 in

Cumulative Runoff

4.9876 in
218.206 ac-ft

HYG Volume... 218.216 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 2.20443 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .05068 hrs = 0.03448 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 269.85 cfs
Unit peak time Tp = 1.46958 hrs
Unit receding limb, Tr = 5.87833 hrs
Total unit time, Tb = 7.34792 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	427.348		13.5000	592.74		
POND 10	IN	POND	100	427.348		13.5000	592.74		
POND 10	OUT	POND	100	427.348		13.5000	592.74		
SUBAREA 10		AREA	100	427.348		13.5000	592.74		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = 4.7082 hrs
Drainage Area = 1106.000 acres Runoff CN= 70

==========
Computational Time Increment = .04982 hrs
Computed Peak Time = 13.5014 hrs
Computed Peak Flow = 592.75 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 13.5000 hrs
Peak Flow, Interpolated Output = 592.74 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 70
Area = 1106.000 acres
S = 4.2857 in
0.2S = .8571 in

Cumulative Runoff

4.6366 in
427.344 ac-ft

HYG Volume... 427.348 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 4.70818 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .04982 hrs = 0.01587 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 266.17 cfs
Unit peak time Tp = 3.13871 hrs
Unit receding limb, Tr = 12.55483 hrs
Total unit time, Tb = 15.69354 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	1405.757		14.2500	1752.50		
POND 10	IN	POND	100	1405.757		14.2500	1752.50		
POND 10	OUT	POND	100	1405.757		14.2500	1752.50		
SUBAREA 10		AREA	100	1405.757		14.2500	1752.50		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = 5.5475 hrs
Drainage Area = 3732.000 acres Runoff CN= 69

==========
Computational Time Increment = .04998 hrs
Computed Peak Time = 14.2433 hrs
Computed Peak Flow = 1752.51 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 14.2500 hrs
Peak Flow, Interpolated Output = 1752.50 cfs
==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 69
Area = 3732.000 acres
S = 4.4928 in
0.2S = .8986 in

Cumulative Runoff

4.5201 in
1405.756 ac-ft

HYG Volume... 1405.757 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 5.54754 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .04998 hrs = 0.01351 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 762.25 cfs
Unit peak time Tp = 3.69827 hrs
Unit receding limb, Tr = 14.79307 hrs
Total unit time, Tb = 18.49134 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: MyCounty

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	8.2000	Synthetic Curve	TypeI 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	100	99.932		11.2500	246.62		
POND 10	IN	POND	100	99.932		11.2500	246.62		
POND 10	OUT	POND	100	99.932		11.2500	246.62		
SUBAREA 10		AREA	100	99.932		11.2500	246.62		

SCS UNIT HYDROGRAPH METHOD
Calc.Method Option = 2
STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 8.2000 in
Rain Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
Rain File -ID = - TypeI 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = V:\Projdata\06proj\06021\Calcs\OFFSITE DRAINAGE\
HYG File - ID = - SUBAREA 10 Pre100
Tc = 1.9065 hrs
Drainage Area = 246.230 acres Runoff CN= 72

==========

Computational Time Increment	=	.05084 hrs
Computed Peak Time	=	11.2351 hrs
Computed Peak Flow	=	246.76 cfs
Time Increment for HYG File	=	.0500 hrs
Peak Time, Interpolated Output	=	11.2500 hrs
Peak Flow, Interpolated Output	=	246.62 cfs

==========

DRAINAGE AREA

ID:SUBAREA 10
CN = 72
Area = 246.230 acres
S = 3.8889 in
0.2S = .7778 in

Cumulative Runoff

4.8704 in
99.936 ac-ft

HYG Volume... 99.932 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 1.90646 hrs (ID: SUBAREA 10)
Computational Incr, Tm = .05084 hrs = 0.04000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak,	qp =	146.34 cfs
Unit peak time	Tp =	1.27094 hrs
Unit receding limb,	Tr =	5.08377 hrs
Total unit time,	Tb =	6.35471 hrs

Appendix S

Water Plan Analysis

ANALYSIS
OF THE WATER PLAN
FOR THE
COMMUNITY-BASED
ENTERPRISE COMMUNITY/MOLOKA`I RANCH
MASTER LAND USE PLAN

I. INTRODUCTION AND PURPOSE

The purpose of this report is to analyze whether the Water Plan proposed for Community-Based Enterprise Community/Molokai Ranch Master Land Use Plan ("Master Land Use Plan") is reasonable and realistic. In particular, this study analyzes:

(1) Whether the projected water demands are reasonable and realistic for the proposed land use plan; and
(2) Whether the identified sources of water to meet the demands are realistically available.

For purposes of this report, a "reasonable and realistic" determination is based primarily upon a regulatory analysis, i.e., considering regulatory, policy, and other legal constraints. The author is not a hydrologist, geologist, or engineer. Thus, no analysis is made, and no opinions are expressed, about the reliability of water resource data upon which regulatory decisions are made, e.g., sustainable yields estimates adopted for the Molokai aquifer systems. Additionally, no analysis is made or opinion expressed about the economic feasibility of the proposed Water Plan.

This report begins in Section II with a brief description of Master Land Use Plan and a discussion of the supporting Water Plan . Section III provides a brief description of fresh water resources on Molokai. A description of the major water developments and water users that potentially may affect, or be affected by, implementation of the Water Plan is provided in Section IV. A nutshell review of pertinent water laws and regulations follows in Section V. Finally, considering all of the above, the analysis set forth in Section VI concludes that the Water Plan is reasonable and realistic.

II. MASTER LAND USE PLAN AND WATER PLAN

A. Community-Based Master Land Use Plan

Molokai Properties, Ltd. (MPL) is the largest private landowner on Molokai, with approximately 65,000 acres in western and central Molokai. Most of that land is currently undeveloped or utilized in low intensity agriculture (ranching, pasture).

The Master Land Use Plan proposes setting aside over 85% of these lands and protecting them forever from any further development. Of the lands that will be set aside, 26,200 acres to be held in perpetuity for the community in a Molokai Land Trust. An additional 29,000 acres will be subject to protective easements that will limit uses to agriculture, conservation and preserving open space. To preserve Molokai's agricultural economy and lifestyle, 14,390 acres that are currently in grass or crops will be protected for future agricultural use.

Instead of the several residential and condominium developments that had been proposed over the years by Molokai Ranch, Alpha USA, and Kaluakoi, MPL (which currently owns, in addition to the Ranch lands, Kaluakoi and the lands previously owned by Alpha USA) will provide approximately 200 acres around Maunaloa and Kualapuu for housing for the community, and approximately 1000 acres above Kaunakakai for future community expansion. The nature and timing of these developments will be determined by Molokai residents.

MPL will limit its future residential development to no more than 200 two-acre lots at Laau Point. These lots will be subject to a number of restrictive covenants that will prevent increased densities. For example, further subdivision of individual lots will be prohibited and disturbance of each 2-acre lot will be limited to no more than 30% (approximately one-half acre).

On the commercial side, MPL will reopen the Kaluakoi Hotel, including the golf course. The Lodge at Maunaloa, and the Paniolo, Kolo, and Kaupoa visitor camps will continue to operate at current levels. Expansion of the Pala`au Industrial Park is expected to more than double current potable water consumption to approximately 297,000 gpd.

B. Water Plan

A key feature of the Water Plan is that only existing sources, at currently permitted amounts, will be utilized to meet all of the potable water needs for Waiola O Molokai and Molokai Public Utilities' current customers and MPL's future developments proposed under the Master Land Use Plan.

MPL controls three water systems: (1) the Kaluakoi System, operated by Molokai Public Utilities, Inc., which services the existing Kaluakoi Development; (2) the Waiola O Molokai, Inc. System, which supplies drinking water to communities on Molokai Ranch land; and (3) the Molokai Ranch Mountain Water System, which currently provides potable water for

Maunaloa and Palaau Industrial Park, irrigation water for Maunaloa Village, the Lodge and Kaupoa Camp, and water for Molokai Ranch's livestock operations.

The source of water for the Kaluakoi System is Well 17, located in the Kualapuu Aquifer system. A water use permit for 1,018,000 gpd from Well 17 has been issued by the Water Commission.[1] Permitted uses include the Kaluakoi Hotel, condominiums and residential uses, the golf course and other irrigation uses, as well as 76,000 gpd that is sold to Waiola for servicing Kualapuu Town, and the 94,000 gpd "charge" for transmission of Well 17 water through the Molokai Irrigation System to Kaluakoi.

Waiola purchases water from the Kaluakoi's Well 17, from DHHL's Kualapuu wells, and from Molokai Ranch's Mountain Water system, which is treated for potable use at Waiola's Puu Nana water treatment plant. Current demand is approximately 195,000 gpd.

The Mountain Water System moves surface water approximately 20 miles from the mountains of Central Molokai to the far reaches of MPL's holdings. The system has an average yield of 500,000 gpd, but, as with all surface water systems, is highly dependent on the weather. Currently, approximately 500,000 gpd from the Mountain Water System has been treated at the Puu Nana water treatment plant for potable uses in Maunaloa and Palaau Industrial Park.

The Water Plan proposes that potable water needs for existing uses and additional needs resulting from the reopening of the Kaluakoi Hotel and development at Laau Point will be met with 1,018,000 gpd from Well 17 and 500,000 gpd of treated water from MRL's mountain water system. Waiola will abandon plans to develop a potable water well in the Kamiloloa Aquifer.

Nonpotable water demands will be met with the remaining water developed by the Mountain Water System and by development of 1 mgd of brackish water from the Kakalahale Well in the Kamiloloa Aquifer. Additionally, in the future, treated wastewater will be another source of irrigation water for the golf course. Other nonpotable uses will include landscaping and irrigation around Kaluakoi, the future Laau Point lots, Maunaloa Village, the Lodge and Kaupoa Camp, and water for Molokai Ranch's livestock operations.

The Water Plan prepared by MPL, dated December 2004, is attached as Appendix A.

III. BRIEF DESCRIPTION OF MOLOKAI WATER RESOURCES

Typical of all of the major Hawaiian Islands, Molokai has very wet areas with abundant water resources and very arid areas where water resources are scarce. Rainfall on Molokai ranges from more than 150 inches in the higher elevations of the northeastern part of the island to less than 16 inches in the coast areas of south and west Molokai.[2]

A. Ground Water Resources

Molokai's ground water resources are of three types: basal, perched, and dike-confined. Although basal groundwater underlies most of the island, its quality varies significantly. Generally speaking, good quality potable water is found in East Molokai; basal water is somewhat brackish in Central Molokai, and completely brackish in West Molokai.

Percolating water temporarily perched on ash beds is often of such volume that some of it runs underground along the bed and issues as springs. Some of these springs have a sufficiently regular flow to be included in the County water system.

The perennial streams in East Molokai are largely due to springs issuing from dike structures. Dike- confined water is also developed with tunnels or wells.[3]

1. Sustainable Yields[4]

For purposes of planning and management of ground water resources, the Water Commission divides each island into Aquifer Sectors, which reflect broad hydrogeological similarities yet maintain traditional hydrographic, topographic, and historical boundaries where possible. As subsets of Aquifer Sectors, Aquifer Systems are more specifically defined by hydraulic continuity.

Sustainable yields are established for each Aquifer System by the Water Commission. Sustainable yield refers to the forced withdrawal rate of groundwater that could be sustained indefinitely without affecting either the quality of the pumped water or the volume rate of pumping. Head is the elevation of the unconfined water table above sea level. There is not a unique value for sustainable yield; the value depends on the head that will preserve the integrity of the groundwater resource at the level decided upon by the Water Commission.

Although established sustainable yield estimates are used as key management tools by the Water Commission, they are sometimes based on scanty data, and, therefore, not very reliable. Furthermore, the sustainable yield estimate for any aquifer system does not consider the feasibility of developing the groundwater. In many regions, including the windward areas of East Molokai, taking advantage of a high sustainable yield estimate may not be economically feasible.

Total estimated sustainable yield for the island of Molokai is 81 mgd The following table shows the sustainable yield for each aquifer system.

Aquifer Sector	Aquifer System	SY	Quality
West	40101 – Kaluakoi	2 mgd	Brackish
West	40102 – Punakou	2 mgd	Brackish
Central	40201 – Hoolehua	2 mgd	Moderately brackish
Central	40202 – Maunawainui	2 mgd	Moderately brackish
Central	40203 – Kualapuu	5 mgd	Potable
Southeast	40301 – Kamiloloa	3 mgd	Potable
Southeast	40302 – Kawela	5 mgd	Potable
Southeast	40303 – Ualapue	8 mgd	Potable
Southeast	40304 – Waialua	8 mgd	Potable
Northeast	40401 – Kalaupapa	2 mgd	Potable
Northeast	40402 – Kahanui	3 mgd	Potable
Northeast	40403 – Waikolu	5 mgd	Potable
Northeast	40404 – Haupu	2 mgd	Potable
Northeast	40405 – Pelekunu	9 mgd	Potable
Northeast	40406 – Wailau	15 mgd	Potable
Northeast	40407 – Halawa	8 mgd	Potable

B. Surface Water Resources

There are 36 perennial streams on Molokai. "Perennial streams" include (1) continuous streams that flow to the sea year-round under normal conditions, including streams with diversions, and (2) interrupted streams (whether the interruptions are natural or man-made) that flow year-round in the upper portions and intermittently at lower elevations under normal conditions.[5]

Virtually all of the stream flow on Molokai originates in the East Molokai mountains, flows north and east to the ocean and is characteristically flashy.[6] In general, streams in the windward northeastern valleys of Molokai are perennial throughout most of their lengths. Most of the streams that drain to the southern cost of East Molokai are perennial only in the upper reaches where rainfall is persistent or where water is drained from marsh area or springs.[7] No measurable stream flow occurs in arid and semi-arid Central and West Molokai.[8]

All of the streams on Molokai are considered "small streams," meaning they have median flows less than or equal to 10 cubic feet per second (cfs) or average flows less than or equal to 20 cfs.[9]

IV. MOLOKAI WATER SYSTEMS

A discussion of the major water systems in west and central Molokai is presented here for consideration of how the Water Plan may affect, or be affected by, other water users.

A. DHHL

The State Department of Hawaiian Home Lands (DHHL) is one of the major landowners on Molokai, owning more than 25,000 acres in Hoolehua, Kalamaula, Kalupapa, Kamiloloa, Kapaakea, and Makakupa'ia. Its Central Molokai homesteads are served by a water system that draws from two wells in Kualapuu (0801-01 and 0801-02). Permitted withdrawals from these two wells total 367,000 gpd. Not all of the water withdrawn from these wells are used on the homestead lots. Waiola purchases approximately 20,000 gpd from DHHL to serve its customers in the Kipu/Kalae area.[10]

DHHL also has a reservation for 2.905 mgd from the Kualapuu Aquifer. This reservation essentially precludes any new ground water development in the Kualapuu Aquifer, except by DHHL. No definite plans are yet known as to when or where DHHL will draw on this reservation. There had been a proposal to increase withdrawals from DHHL's existing wells; however, new well sites will have to be developed to access the full amount of the reservation.

B. County

Maui County's water system on Molokai includes well 0801-03 in close proximity to the two DHHL Kualapuu wells. The County has a permit to withdraw approximately 0.5 mgd from this well.

Additionally, along the southern coastal areas of East Molokai are the County's Kaunakakai and Ualapue systems which utilize ground water from the basal aquifer.[11]

C. Private Systems

Since the purchase of Kaluakoi Development by Molokai Properties, Ltd. in 2001, the major private water systems on the island are ultimately controlled by the same entity.

1. Wai`ola O Molokai

Wai`ola O Molokai, a regulated public utility, is a wholly owned subsidiary of Molokai Ranch, Limited. It is a regulated public utility in the business of purveying potable water to end users. Currently, it supplies residences and businesses in Kipu/Kalae, Kualapuu, and Maunaloa.

Wai`ola does not own any water source. Instead, its water supply is provided by Molokai Ranch's Mountain Water System and through purchases of water from DHHL and Well 17.

In 1998, following contested case proceedings, Wai'ola obtained from the Water Commission authority to drill a deep potable water well in the Kamiloloa Aquifer and withdraw approximately 656,000 gpd to serve Wai'ola's existing customers and for future developments planned by Molokai Ranch. The permit issuance was appealed to the Hawaii Supreme Court, which, in 2004, vacated the permit and remanded the case to the Water Commission for further proceedings. Due to changes in land use plans, as encompassed in the Master Land Use Plan, Wai'ola has not sought commencement of remand proceedings. Instead, under the Water Plan, Wai'ola will abandon plans to develop the potable water well in the Kamiloloa Aquifer.

2. Molokai Ranch Mountain Water System

Six stream diversions and one tunnel in the upper Kawela, Kamakou and Lualohi basins supply the Molokai Ranch Mountain Water System, which feeds Maunaloa Village and Kualapuu. The yield from these sources varies substantially from season to season, with the minimum flow estimated to be about 110,000 gpd.[12]

A 20-mile long gravity-fed transmission system connects the central Molokai sources with Maunaloa Village. From Puu Nana, there is a connection to the Kaluakoi system. Ten million gallons of storage exist within the system.

At Puu Nana, a water treatment plant treats approximately 0.5 mgd of nonpotable water from the Mountain Water System to drinking water standards for distribution to Waiola's customers. The remainder of the water developed by the Mountain Water System is used for irrigation in Maunaloa Village, the Lodge, and Kaupoa Camp, and for Molokai Ranch's livestock operations.

3. Well 17

In Kualapuu, Wells 0902-01 and 0901-01, drilled in 1946 and 1950, respectively, were originally used to irrigate pineapple fields in the Hoolehua Plain area. Well 0902-01 was abandoned in 1964 when water from the Molokai Irrigation System became available. Since 1976, water from well 0901-01, referred to as Well 17, has been used for domestic and irrigation purposes in Kaluakoi, through a system operated by Molokai Public Utilities, Inc. (MPU), a regulated public utility.

The water use permit for Well 17 permits the withdrawal of 1.018 mgd for domestic and irrigation uses in Kaluakoi and for Wai'ola's customers in Kualapuu Town.

Although Well 17 produces potable quality water, the water is treated to meet drinking water standards because in the transmission of water from Well 17 to Kaluakoi, Well 17 water is combined with nonpotable water. Until recently, water used at Kaluakoi was transmitted via the MIS to the west end where it is treated before distribution to customers. This treatment facility has been out of compliance for several years and the subject of a Department of Health Compliance Order. Now, with MPU under common ownership with Molokai Ranch,

a more efficient system is being implemented. Water from Well 17 is combined with water from the Mountain Water System, treated to drinking water standards at the Puu Nana treatment plant, and delivered to the Kaluakoi use area via existing pipes and Molokai Ranch's reservoir at Maunaloa.

D. MOLOKAI IRRIGATION SYSTEM

The Molokai Irrigation System (MIS), built by the State and funded by Federal and State funds, develops surface water and high-level ground water in Waikolu Valley on East Molokai to irrigate farm lands in the central and western parts of the island. Three production wells (0855-01 to -03) drilled in 1961 withdraw water from the dike complex in northeastern Molokai. Combined with surface water diverted from Waikolu Stream, the MIS transports approximately 1.5 mgd via a 10-mile tunnel and pipeline transmission link from the wet northeast section to the central plain. An open reservoir at Kualapuu stores the water prior to its entering a distribution network extending from Hoolehua to Mahana.

Although the existing system is denominated the "first phase," there are no near-term plans for expansion of the MIS.

Pursuant to HRS § 168-4, DHHL lessees have a priority right to two-thirds of the water developed by the MIS system.[13]

V. WATER LAWS, REGULATIONS AND POLICIES

Any analysis of water use or development on Molokai requires consideration of the State Water Code, common law, and the public trust doctrine, as well as the Hawaii Water Plan, and, in particular, the Maui County Water Use and Development Plan, and also the report of the Molokai Water Working Group. Additionally, because DHHL has large landholdings on Molokai, especial consideration of DHHL's water rights is imperative in any discussion of water regulation on Molokai.

A. State Water Code

Pursuant to Article XI, § 7 of the Hawaii State Constitution, the legislature enacted the Hawaii Water Code, Hawaii Revised Statutes Chapter 174C, in 1987. A primary feature of the Water Code is the regulation of water usage through a permitting system under the jurisdiction of the Commission on Water Resource Management (Water Commission). This permitting jurisdiction exists in water management areas that have been so designated by the Water Commission. Outside of designated water management areas, the Hawaii Supreme Court has stated that the common law governs.[14] While this is generally true with respect to ground water, the Water Commission has extensive regulatory authority over all surface waters in streams, whether or not in designated water management areas.

1. Ground Water

The entire island of Molokai was designated as a ground water management area effective May 13, 1992. Thus, a water use permit issued by the Water Commission is required for the withdrawal or use of any ground water on Molokai.[15]

Within one year of the effective date of designation, all existing uses of Molokai ground water was to have filed applications for existing use permits.[16] Although, as a general rule, existing uses have priority over new uses, existing uses must be shown to be "reasonable-beneficial" and allowable under the common law of the state.[17]

Any new uses of water, i.e., uses not occurring on or before May 13, 1992, or uses which had been occurring on or before May 13, 1992, but failed to obtain existing use permits for failing to timely file an existing use application or other reasons, must meet all seven criteria set forth in HRS § 174C-49(a) in order to obtain a water use permit from the Water Commission.

1) That the proposed use of water can be accommodated with the available water source;
2) That the proposed use of water is a reasonable-beneficial use: that it is a "use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest;
3) That the proposed use of water will not interfere with existing legal uses of water;
4) That the proposed use of water is in the public interest;

5) That the proposed use of water complies with state and county general plans and land use designations;
6) That the proposed use of water complies with county land use plans and policies; and
7) That the proposed use of water would not interfere with rights of the Department of Hawaiian Home Lands.

Ground water use permits that have been issued by the Water Commission for existing and new uses in west and central Molokai (areas potentially affected by the Water Plan), are listed below.

Aquifer System	**Well**	**Permit Allocation (MGD)**
Kualapuu	0901-01 Well 17[18]	1.018
	0801-03 Maui DWS	0.516
	0801-01 DHHL 1 0801-02 DHHL 2	0.367
Kamiloloa	0501-04 Kupa Shaft/Haw'n Res.	0.056
	0501-06 Puuehana/Hale Mohalu	0.005
	0501-07 Kaiwakakai Park	0.075
	0601-01 Oloolo/Haw'n REs.	0.075
	0759-01 – Waiola [19]	0.656
Kawela	0456-01 Breadfruit Tree	0.285
	0457-01 Kawela Shaft/DWS	0.330

2. Surface Water

Currently, there are no surface water management areas on Molokai.[20] This does not mean, however, that the Water Commission lacks regulatory powers with respect to surface waters. Indeed, a primary reason for not designating surface water management areas is that the Water Commission has, and exercises, regulatory authority that provides the same protections for streams that designation would offer.

HRS § 174C-3 defines "stream" as "any river, creek, slough, or natural watercourse in which water usually flows in a defined bed or channel. It is not essential that the flowing be uniform or uninterrupted. The fact that some parts of the bed or channel have been dredged or improved does not prevent the watercourse from being a stream."

A "stream diversion" is "the act of removing water from a stream into a channel, pipeline, or other conduit." "Channel alteration" under HRS § 174C-3 means (1) to obstruct, diminish, destroy, modify, or relocate a stream channel; (2) to change the direction of flow of water in a stream channel; (3) to place any material or structures in a stream channel; and (4) to remove any materials or structures from a stream channel.

A permit is required for any stream diversion or channel alteration (except for routine maintenance), whether or not the stream is in a water management area. As with water use permit applications, the Water Commission reviews the application for stream diversion or alteration for consistency with state and county land use plans and policies.[21] Additionally, the Commission is guided by the following considerations:

1) The quantity and quality of the stream water or the stream ecology shall not be adversely affected;
2) Where instream flow standards or interim instream flow standards have been established pursuant to HAR chapter 13-169, no permit should be granted for any diversion works which diminishes the quantity or quality of stream water below the minimum established to support identified instream uses, as expressed in the standards; and
3) The proposed diversion works shall not interfere substantially and materially with existing instream or noninstream uses or with diversion works previously permitted.[22]

Notwithstanding those considerations, however, a stream diversion permit or a channel alteration permit may be granted if the Water Commission determines that it would clearly be in the public interest.[23]

In essence, the Water Commission goes through most of the same analysis in deciding on a stream diversion or channel alteration permit as it does for a water use permit in a designated water management area. In some cases, obtaining a stream diversions or channel alterations permit may be even more difficult to obtain than a ground water use permit. That is because, pursuant to the second criterion, diversions or alterations that would diminish the quantity or quality of water below the established instream flow standard or interim instream flow standard are not to be granted unless there is some clear overriding public interest.[24]

a. IIFS for Molokai streams

The Water Code defines "instream flow standard" as "a quantity or flow of water or depth of water which is required to be present at a specific location in a stream system at certain specified times of the year to protect fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses.[25] An "interim instream flow standard" is "a temporary instream flow standard of immediate applicability, adopted by the commission without the necessity of a public hearing, and terminating upon the establishment of an instream flow standard." [26]

Currently, the interim instream flow standard for all Molokai streams reflects the status quo as of June 15, 1988.[27] This IIFS was based on water diversions existing on that date and not on analyses of biological, ecological, or other instream values weighed against economic impacts of offstream diversions.[28]

3. Reasonable-Beneficial

To obtain a water use permit, whether for existing or new uses, the proposed use must be shown to be reasonable-beneficial. Criteria for stream diversion permits, while not couched in the same terminology, essentially include the same elements as a reasonable-beneficial test.

"Reasonable-beneficial" is defined in HRS § 174C-3 as the "use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest."

Over the past several years, three significant concepts have been developing and are being applied by the Water Commission in conducting any "reasonable-beneficial" analysis. These are:

(1) Proposed water uses must be consistent with county zoning approvals;
(2) Water duties will be closely scrutinized to promote efficient use of water; and
(3) Alternative sources analyses must be conducted.

a. Consistency with County Zoning Approvals

In Hawaii, at the State level, the State Land Use Commission classifies all lands as either urban, rural, agricultural and conservation. Except for conservation district lands, the uses of which are regulated by the Board of Land and Natural Resources, the counties have a certain degree of authority in regulating particular uses and establishing specific requirements within these broad classifications.

At the county level, each of the counties has adopted its own general plan that includes broad policy statements about the overall development and future of the county. County development or community plans guide development within specific regions or communities within the county, and must be consistent with the county general plan. Finally, zoning designations for individual lots must be consistent with the relevant community plan.

It is not explicit, from the language of the Water Code, whether appropriate county zoning designations are required prior to obtaining a permit for a proposed use of water in order to be "consistent with the state and county land use plans" to meet the reasonable-beneficial test. The Water Commission, in practice, had consistently required that county zoning designations be consistent with the proposed use. In the *Wa`iola* case, the applicant had argued that the timing for obtaining appropriate county zoning designations may not be conducive to long-term water planning, including infrastructure development, and that consistency with the community plan would be a more appropriate test. Wai`ola's argument had been rejected by the Water Commission, and that decision has not been overturned by the Hawaii Supreme Court.[29] Thus, any proposed water use for future developments must show that it has obtained appropriate county zoning designations before the Water Commission will issue a water use or stream diversion permit for such use.

b. Water Duties

A significant issue in the Waiahole Ditch case involved appropriate water duties for particular uses. In that case the Water Commission generally applied a water duty of 2500 gallons per acre per day for diversified agriculture and 2000 gpad for pineapple in Kunia, Oahu; but varied from that standard where particular facts and circumstances evidenced different actual usage. In one case, the allocation was higher than 2500 gpad; in another it was lower. On appeal, the supreme court conducted a lengthy review of how the Water Commission arrived at and applied the water duties, and twice remanded the allocations to the Water Commission for further review.

One of the lessons to be gleaned from the Waiahole Ditch case is that the efficient use of water, one of the benchmarks of a reasonable-beneficial use, will be closely scrutinized through a water duty analysis.

For domestic uses, standards established by the county water departments serve as general guidelines. A more complex analysis is required for irrigation uses.

c. Alternative Sources

An alternative water source analysis, according to the Hawaii Supreme Court, is "intrinsic to the public trust" and the definition of "reasonable-beneficial." [30] Thus, before issuing a water use permit for any proposed use, the Water Commission must ask whether there are other sources of water that could practicably be used for this same purpose. Practicable for this purpose, means that the water is available and capable of being utilized considering cost, technology and logistics.[31] If more than one source of water can practicably be used for the same purpose, then the Water Commission may (and, indeed, may be obligated to) prioritize among the water resources and decide which source should be utilized.

For example, in the Waiahole Ditch contested case, the Water Commission was faced with whether to allow agricultural lands to be irrigated with water that originated on the Windward side of Oahu and directly affected stream flow inasmuch as it may have been practicable to use groundwater pumped from the Leeward side of the island for the same purpose. In prioritizing water resources, the Commission may, among other things, decide that the Leeward groundwater, being of potable quality, should be held in reserve for future drinking water needs, or, alternatively, decide that the benefits from having more water in the streams justified the use of groundwater for irrigation.

As technologies improve and costs decrease, desalinated water and reclaimed wastewater will more and more become practicable alternative sources of non-potable water.

B. Common Law

Common law governs outside of designated water management areas.[32] The common law of water in Hawaii, however, is not well developed, and more questions than answers abound, including questions relating to the intersection and interrelationship of common law with the Water Code.

1. Ground Water: Correlative Rights

City Mill Company, Limited v. Honolulu Sewer and Water Commission[33] held that the rule of correlative rights expresses the common law relating to groundwater in Hawaii. As explained by the court:

> [A]ll of the owners of lands under which lies an artesian basin have rights to the waters of that basin; that each may use water therefrom as long a he does not injure thereby the rights of others and that in times when there is not sufficient water for all each will be limited to a reasonable share of the water.[34]

For purposes of this report, however, the rule of correlative rights is irrelevant. The supreme court, in the Waiahole case, held that the regulatory system based on permits issued by the Water Commission displaces the common law of correlative rights in designated water management areas.[35] Because the entire island of Molokai is designated as water management areas, rights to withdraw and use groundwater are established through permits issued under the Water Code, rather than pursuant to common law doctrines.

2. Surface Water: Riparian Rights

Riparian owners (very generally, those who own land abutting a stream) possessed riparian rights to water pursuant to HRS § 7-1. In *Reppun v. Board of Water Supply*,[36] the Hawaii Supreme Court adopted the "reasonable use doctrine" of riparian rights. Under the reasonable use doctrine "a riparian owner is entitled only to a reasonable use of the waters of a natural watercourse and may not bring an action to prohibit the reasonable use of another absent a demonstration of injury to his own use." [37]

It is clear that riparian rights attach to riparian lands and that the owner cannot convey those rights separate from the land. Beyond that, there is very little that is clear about Hawaii's common law of riparian rights.

Furthermore, questions about how riparian rights under the common law coalesce with permitting requirements for stream diversions and with interim instream flow standards remain unanswered.

On Molokai, where many of the perennial streams are in remote locations removed from developable lands (for agriculture or otherwise), issues surrounding riparian rights are not as urgent as they may be on other islands.

3. Surface Water: Appurtenant Rights

Appurtenant water rights are measured by the amount of land under taro cultivation at the time of the Mahele, multiplied by the average quantity of water used per day per acre in growing that taro. The water rights remain with the land even when taro ceases to be

cultivated on the land. But the water is appurtenant to the taro land and cannot be transferred to other lands.[38] And an attempt to sever the appurtenant water right from the land may extinguish the appurtenant right.[39]

Unlike correlative rights and riparian rights, appurtenant rights are not displaced by the Water Code, even in designated surface water management areas. Instead, Article XI. § 7 of the State Constitution assured its survival and the Water Code accords some of the highest priority and clear preferential treatment to appurtenant water rights.

C. Underlying Policies

1. Rights of DHHL

In addition to the requirement that all water use permits not interfere with, and be subject to, the rights of DHHL, subsection 174C-101(a) of the Water Code provides:

> **§174C-101 Native Hawaiian water rights.** (a) Provisions of this chapter shall not be construed to amend or modify rights or entitlements to water as provided for by the Hawaiian Homes Commission Act, 1920, as amended, and by chapters 167 and 168, relating to the Molokai irrigation system. Decisions of the commission on water resource management relating to the planning for, regulation, management, and conservation of water resources in the State shall, to the extent applicable and consistent with other legal requirements and authority, incorporate and protect adequate reserves of water for current and foreseeable development and use of Hawaiian home lands as set forth in section 221 of the Hawaiian Homes Commission Act.

The essence of Section 221 of the HHCA is the provision of adequate water for the productive use of Hawaiian home lands.[40]

In the *Waiola* case, the Hawaii supreme court held that the Water Commission has a public trust duty to protect a reservation of water for DHHL's future needs. Protecting such a reservation means not only subtracting the amount of the reservation from the available sustainable yield of the aquifer, but also assuring that other water developments do not otherwise jeopardize DHHL's ability to access the reserved water in the future.

Currently on Molokai, DHHL holds a reservation for 2.905 mgd from the Kualapuu Aquifer.

Additionally, pursuant to HRS §168-4, DHHL lessees have a priority right to two-thirds of the water developed for the MIS.

2. Traditional and Customary Native Hawaiian Rights

The Water Code, in section 174C-101(c), provides for the protection of traditional and customary native Hawaiian rights:

> Traditional and customary rights of ahupua`a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778 shall not be abridged or denied by this chapter. Such traditional and customary rights shall include, but not be limited to, the cultivation or propagation of taro on one's own kuleana and the gathering of hihiwai, opae, o`opu, limu, thatch, ti leaf, aho cord, and medicinal plants for subsistence, cultural, and religious purposes.

In the surface water arena, issues involving traditional and customary rights have centered around the availability of water for growing taro, and adequacy of stream flows for indigenous flora and fauna traditionally gathered by native Hawaiians.

With respect to ground water, the issue has primarily been the effect of groundwater withdrawals on freshwater discharge into the ocean and the impact on nearshore biota, such as limu.

3. Public Trust

All decisions made by the Water Commission, including the issuance of water use permits, are overlain by the Commission's responsibility to uphold the public trust doctrine. The Hawaii Supreme Court iterated three fundamental principles embodied in the state water resources trust:

> First, the state has both the authority and duty to preserve the rights of present and future generations in the waters of the state, which, in effect, precludes any grant or assertion of vested rights to use water to the detriment of a public trust purpose. This authority empowers the state to revisit prior diversions and allocations, even those made with due consideration of their effect on the public trust. Second, the state bears an affirmative duty to take the public trust into account in the planning and allocation of water resources and to protect public trust uses whenever feasible. Third, there are no absolute priorities between broad categories of trust uses under the water resources trust, precisely because all public trust purposes must be protected; thus, the Commission must weigh competing public and private water uses on a case-by-case basis. That being the case, the Commission, as the primary guardian of public rights under the trust, must take the initiative in considering, protecting, and advancing public rights in the resource at every stage of the planning and decision making process. In sum, the state may compromise public rights in the resource pursuant only to a decision made with a level of openness, diligence, and foresight commensurate with the high priority these rights command under the laws of our state.[41]

The purposes or uses of the public trust can evolve with changing public values and needs.[42] As of this date, the Hawaii Supreme Court has identified four "uses" protected under the public trust doctrine: (1) maintaining the purity and flow, the continued existence and preservation of the waters of the state; (2) domestic uses, primarily drinking; (3) to preserve

Native Hawaiian and traditional and customary rights; and (4) reservations of water to DHHL for current and foreseeable domestic, stock water, aquaculture, and irrigation activities on tracts leased to native Hawaiians.[43]

D. Hawaii Water Plan: Maui County Water Use and Development Plan

The Water Code requires that the Water Commission implement and utilize comprehensive water resources planning in its regulation and management of the State's water resources. As part of that mandate, the Water Code requires the development and updating of the Hawaii Water Plan to guide the Water Commission in its general powers, duties, and responsibilities assuring economic development, good municipal services, agricultural stability, and water resource protection.

The Water Code calls for coordination among the Water Commission, the counties and other state agencies to formulate an integrated and coordinated program for the protection, conservation, and management of water in each county.

County water use and development plans are components of the Hawaii Water Plan intended to insure that the future water needs of the county are met by setting forth "the allocation of water to land use."

1. Current Status of Hawaii Water Plan

The initial Hawaii Water Plan prepared by various state and county agencies was formally adopted by the Water Commission in 1990. Action on a 1992 update was deferred pending further refinements to plan components.

In 2000, the Water Commission adopted a Statewide Framework to guide the updating of the various components of the Hawaii Water Plan. The updating process is currently ongoing. No updated plan has yet been approved by the Water Commission. Thus, the 1990 Hawaii Water Plan is still the official document.

2. Maui County Water Use and Development Plan

The Maui County Water Use and Development Plan (WUDP) was passed as an ordinance by the Maui County Council and approved by the Mayor in October 1990.

Much of what is stated in the WUDP with respect to Molokai is significantly outdated. At the time the WUDP was being prepared, three large landowners - Molokai Ranch, the owner of more than 50,000 acres in central and west Molokai; Kukui (Molokai), then the owner of the Kaluakoi Resort; and Alpha USA, owner of approximately 6,300 acres in west Molokai – were in various stages of making significant development plans for their respective properties. At the time, based on very sketchy data, projected 2010 water demand for these three entities amounted to 10 mgd of potable water. It was anticipated that each of these entities would attempt to secure water from the Kualapuu Aquifer to meet their needs.

Noting that there were no plans for additional surface water development, the WUDP concluded that projected water needs by the major water users in central and west Molokai exceed the estimated sustainable yield of the Kualapuu Aquifer. Therefore, the WUDP recommended that all prospective major water users in central and west Molokai, including DHHL, the county, and the large private landowners, work cooperatively towards developing an integrated water system that would include a non-potable water system. Additionally, evaluation of alternative sources development was encouraged.[44]

E. Molokai Water Working Group

The Molokai Water Working Group was originally appointed in October 1982 by Bill Paty, who was then the Chairperson of the Water Commission. Its purposes were (1) to recommend to the Water Commission a plan for water development on Molokai that assists the county and community in developing its Water Use and Development Plan; and (2) to test a community "working group" model that, if it works, could be used elsewhere in the State when communities are faced with tough water issues. The Working Group was asked to enter into good faith deliberations aimed at producing the highest consensus possible on demand forecasts, bulk water allocations, recommendations to manage both supply and demand, and the best plans the Working Group might offer on balancing future water uses.

The original Working Group presented a written report in July 1993.

In late 1995, then Water Commission Chairperson Mike Wilson convened a second Water Working Group for the express purpose of revisiting and updating the July 1993 report. A revised report, superceding the July 1993 report, was issued by the Working Group in April 1996.

In its 1996 report, the Working Group set forth a number of general recommendations, plus several recommendations specific to each of the four Aquifer Sectors on the island. The complete report is attached as Attachment B. A number of the Working Group recommendations are discussed in the analysis section of this report.

VI. ANALYSIS

The purpose of all of the foregoing is to establish the framework within which the analysis of whether the proposed Water Plan is reasonable and realistic can be made. In other words, based on water laws and policies, water resources and potentially competing demands, what is the likelihood of MPL being able to implement the Water Plan in support of its Master Land Use Plan?

As discussed below, the Water Plan is progressive with respect to both water supply and demand. Conservation strategies currently touted but seldom implemented in Hawaii are integral parts of the Water Plan. In conjunction with the proposal that only existing sources at currently permitted amounts will be used to meet all of MPL's current and future potable water needs, the Water Plan should readily pass regulatory muster. Indeed, it should be held up as a model for balancing development with the preservation and protection of our precious water resources.

A. Reasonable and Realistic Water Demands

1. Potable Water

Essentially, the potable water Plan is to use no more than what is currently available from Well 17 and the 0.5 mgd from Mountain Water System to meet not only existing needs, but also to meet the needs for future growth, i.e., reopening the Kaluakoi Hotel, developing 200 lots at Laau Point, and expansion of Pala`au Industrial Park.

At first blush, such a scheme appears overly optimistic, or even unrealistic. However, it is feasible because the Water Plan calls for (1) significantly decreasing current use of potable water for irrigation; (2) increasing efficiencies within existing systems; and (3) aggressive water conservation strategies.

a. Decreasing Current Use of Potable Water for Irrigation

The Water Commission granted a water use permit authorizing the withdrawal of 1.018 mgd from Well 17 based on the following uses (in gallons per day):

Kaluakoi Hotel	67,000	
Kaluakoi Condos	186,000	
Kaluakoi Residential	51,000	
Golf Course	400,000	
Beach Park	26,000	
Nursery	18,000	
Filter Backwash	100,000	
MIS System Use Charge	94,000	
Kualapuu Town (Waiola)	76,000	
Total		**1,018,000**

Of the 1.018 mgd for authorized uses, more than half is for irrigation purposes, including irrigation of the golf course. In doing an alternative source analysis, as a matter of policy, if non-potable water sources are available, such sources should be used for irrigation in this area where there is not an overabundance of potable water.[45] Under the Water Plan, approximately 600,000 gpd of potable water from Well 17 will be "freed up" from existing irrigation uses by using alternative nonpotable water sources, leaving that amount available for potable needs associated with future developments.

b. Increasing Efficiencies In Existing Systems

Inadequate maintenance of the MPU system has resulted in significant system losses. It is anticipated that current system losses 200,000 gpd can be reduced to about 100,000 with improvements to system.

Additionally, not insignificant amounts of water are lost through evaporation as water is transported to Kaluakoi through the open MIS system. Piping potable water to Kaluakoi from the Puu Nana treatment plant will result in less water being lost to evaporation.

c. Aggressive Water Conservation Strategies

Some of the most aggressive water conservation strategies in the State are being implemented and even further strategies are proposed for the future development at Laau Point.

(1) Conservation Rates

After MPL acquired MPU, it restructured the water rates to, among other things, implement tiered water conservation rates that provide a financial incentive to customers to conserve water. The water duties applied by the Water Commission for different user types was used as the base rate. All water use above that amount is billed at a much higher "conservation rate." The utility had proposed a conservation rate of twice the base rate. Due to concern about "rate shock" expressed by the Consumer Advocate, the conservation rate will be ramped up in phases. Ultimately, however, it is anticipated that a conservation rate that is substantially higher than the base rate will go into effect for water usage that exceeds the water duties upon which the Water Commission bases its allocations.

The effectiveness of conservation rates has already manifested itself. Within 15 months of the conservation rate going into effect, there have been measurable reductions in water usage by Kaluakoi residents. Water consumption has dropped by 45% in the Ranchlands, and a passing shower will cause water consumption to drop dramatically.

(2) Water Conservation Strategies: La`au Point Development

It is anticipated that the majority of the residences in the 200-lot La`au Point subdivision will be second or third homes for the owners. Inasmuch as these residences will probably not be

occupied much of the time, domestic water consumption is anticipated to be less than average for these types of units.

In addition, a number of covenants that will be attached to these lots will ensure conservation of potable water. These covenants include:

- Restrictions on further subdivision of lots
- Disturbance of lot limited to no more than 30% (approx. ½ acre)
- Restrict water use for irrigation (landscaping)
    - ✓ Require re-use and collection/storage systems for catchments
    - ✓ Only drip systems permitted for irrigation
- Require all houses to have at least a 5,000-gallon storage tank for water captured from roofs (could be used for drinking water or irrigation)
- Covenants on drinking water use – designed to ensure an overall maximum drinking water daily use of 500-600 gpd
    - ✓ Double flush toilets
    - ✓ Specially designed shower heads for conservation
    - ✓ Must use dual water system (potable and nonpotable)

By combining these aggressive water conservation strategies with improvements in the existing water delivery systems, and taking irrigation uses off the potable water system (i.e., putting the right water to the right use), the projected potable water demands set forth in the Water Plan are reasonable and realistically achievable.

2. Nonpotable Water Demands

Nonpotable uses will include irrigation of the Kaluakoi golf course, landscaping and other irrigation around Kaluakoi, the future Laau Point lots, Maunaloa Village, the Lodge and Kaupoa Camp, and water for Molokai Ranch's livestock operations.

Under the Water Plan, nonpotable water demands will be met with the remaining water developed by the Mountain Water System and by development of 1 mgd of brackish water from the Kakalahale Well in the Kamiloloa Aquifer. Additionally, in the future, treated wastewater will be another source of irrigation water for the golf course.

Compared to domestic water needs, irrigation water demands (especially non-agriculture demands) are much more flexible and more readily fluctuate relative to supply. Additionally, there are more alternative sources of irrigation water. Thus, nonpotable water demand, for purposes of this report, does not require as vigorous an analysis as the demand for potable water.

Nevertheless, it is worth noting several of the covenants that will be attached to the Laau subdivision that are aimed at limiting the demand for non-potable water from the Ranch's mountain water system or the Kakalahale Well that is proposed for development as a brackish water source. The covenants include:

- Restrict landscaping to appropriate native and Polynesian introduced species that are drought tolerant and suitable for coastal locations
- Drainage systems
  - ✓ Require drainage systems that retain any runoff within the disturbed area of the lot
  - ✓ Maximize recharge into the ground
  - ✓ Restore land area that have eroded by re-establishing vegetative ground cover
  - ✓ Minimize impervious surfaces (paved) on each lot

B. Availability of Identified Water Sources

As noted at the outset of this report, an analysis of the availability of the water sources identified in the Water Plan is a regulatory, and not a hydrological, analysis. This analysis considers the degree of consistency between the Water Plan and the various water laws, regulations, and policies.

1. Consistency with Water Use Permitting Provisions of the Water Code

The water use permitting provisions of the Water Code apply to ground water resources in this case. Under the proposed Water Plan, two ground water sources are identified: (1) the already developed Well 17 in the Kualapuu Aquifer, from which withdrawals of 1.018 mgd is already permitted for uses in Kaluakoi and Kualapuu; and (2) the Kakalahale Well in Kamiloloa, which is already drilled but not yet developed or permitted. The proposal is to develop 1 mgd of brackish water from the Kakalahale Well. No additional withdrawals will be sought from Well 17.

a. Potable Water Source

The Water Commission, in the Kukui (Molokai) case, has already gone through the analysis of the impact of withdrawing 1.018 mgd from Well 17 on other existing uses and on other rights belonging to DHHL, including its reservation of 2.905 mgd in the Kualapuu Aquifer. The permit will have to be modified by removing existing irrigation uses in Kaluakoi as permitted uses and substituting domestic uses for future residences and expansion of Palaau Industrial Park. Such modification should, if anything, improve the reasonable-beneficial analysis by better matching the quality of water to the type of use.

As discussed in an earlier section, the Water Plan incorporates aggressive conservation strategies that are aimed at keeping consumption well within the range of water duties applied by the Water Commission. However, in order to meet the reasonable-beneficial test, before such permit modification can be authorized, appropriate zoning designations will have to be obtained for the future Laau Point development.

b. Nonpotable Water Source

The Water Plan calls for developing 1 million gallons per day of brackish water from the existing, but currently unused, Kakalahale Well. Located in the Kamiloloa Aquifer at

elevation approximately 980 feet, the well was drilled in 1969 to provide drinking water to the Kaluakoi Resort. However, because of the brackish quality of the water, the well was never used as a production well.

A water use permit would be required before the Kakalahale Well can be put into production. While the current sustainable yield of the Kamiloloa Aquifer can accommodate a withdrawal of 1 mgd from this well, the Water Commission will have to analyze whether pumpage of this amount at this location will adversely impact other existing wells, and whether it would jeopardize DHHL's ability in the future to access its reservation of 2.905 mgd from the Kualapuu Aquifer.

Additionally, appropriate zoning designations for the future Laau Point development will have to be obtained prior to issuance of a water use permit for the Kakalahale Well to the extent that uses will include irrigation of the Laau Point lots.

The conservation strategies proposed in the Water Plan should be sufficient for a finding that the proposed use of water will be economic and efficient.

2. Consistency with Surface Water Regulations Under Water Code

The only surface water resources proposed for use under the Water Plan are those already developed by Molokai Ranch's Mountain Water System, which has been diverting surface water for over 100 years. All of the diversions have been registered with the Water Commission since 1987. Inasmuch as all of the existing diversions were in place on June 15, 1988, they are incorporated in the current IIFS. Presently, there are no pending petitions to amend the interim instream flow standards of those streams that are diverted for the Mountain Water System.

3. Consistency with the Common Law

Because the entire island of Molokai is regulated as a ground water management area, the common law relating to ground water, i.e., the doctrine of correlative rights, is inapplicable in this case.

Appurtenant and riparian surface water rights do not appear to be issues in this case inasmuch as the surface water resources identified in the Water Plan have been diverted for over 100 years and there are no currently unresolved claims.

4. Consistency with Rights of DHHL

As discussed above, implementation of the Water Plan will require a finding by the Water Commission that the withdrawal of 1 mgd of brackish water from the Kakalahale Well will not impact DHHL's existing wells in Kualapuu, nor jeopardize DHHL's ability to access its reservation in the Kualapuu Aquifer.

The Water Commission already engaged in that analysis with respect to the wirhdrawal of 1.018 mgd from Well 17. Additionally, there are no outstanding claims by DHHL for the surface water that is diverted by Molokai Ranch's Mountain Water System.

Permits issued by the Water Commission are subject to any superior rights to water that DHHL may have pursuant to the Hawaiian Homes Commission Act.

The Water Plan does not rely on water developed by the MIS, and therefore would have no impact on DHHL's priority rights in that system.

5. Consistency with Traditional and Customary Native Hawaiian Rights

In issuing the permit for withdrawal of 1.018 mgd from Well 17, the Water Commission must have already determined that traditional and customary native Hawaiian rights would not be unduly impacted.

That analysis will have to be conducted with respect to withdrawal of 1 mgd of brackish water from the Kakalahale well.

Presently, there are no outstanding claims that traditional and customary native Hawaiian rights are being abridged by the diversions of the Mountain Water System.

6. Consistency with the Public Trust Doctrine and Identified Public Trust Uses

The Water Plan stays within sustainable limits of water development and thus ensures that water resources are protected for future use. Aggressive conservation measures and putting the right water to the right use through the utilization of alternative sources of water are also consistent with protecting and wisely using water resources as the public trust doctrine mandates.

In the Waiola case, the Hawaii supreme court instructed that

> the state may compromise public rights in the resource pursuant only to a decision made with a level of openness, diligence, and foresight commensurate with the high priority these rights command under the laws of our state.[46]

It is significant (and uncommon) that at this early stage of a master plan development process the level of analysis provided in this report is given for a proposed Water Plan. Engaging the water issues from the outset ensures that decisions will be made with the "level of openness, diligence, and foresight" required of those bearing responsibilities for protecting our public trust resources.

7. Consistency with Maui County Water Use and Development Plan

The Molokai section of the currently approved Maui County Water Use and Development Plan is seriously outdated. However, the developments proposed and anticipated water demand under the current Master Land Use Plan and Water Plan are significantly lower than stated in the Maui WUDP.

Still relevant, however, are the WUDP's recommendations that all prospective major water users in central and west Molokai work cooperatively towards developing an integrated water system that would include a non-potable water system and that alternative water sources be developed.

Integrating the MPU system serving Kaluakoi, the Waiola system serving the potable water needs of Molokai Ranch lands, and the Mountain Water system to increase efficiencies and to better match the quality of water with the type of use is a significant step in addressing the first of the WUDP's recommendation.

Plans for developing the Kakalahale well as a brackish water source, treating effluent for reuse as irrigation water for the golf course, and capturing rainwater and runoff on individual house lots for small scale irrigation are consistent with the second of the WUDP's recommendation.

8. Consistency with Recommendations of Molokai Water Working Group

In its 1996 report, the Molokai Water Working Group set forth a number of general recommendations, plus several recommendations specific to each of the four Aquifer Sectors on the island. Below is an analysis of the consistency of the Water Plan with the relevant Working Group recommendations.

General Recommendation B

> *The working group recommends that all large-scale water planning/water management should consider that agriculture will continue to be the economic and cultural "heart" of Molokai.*

The Master Plan provides for the protection and preservation of agricultural lands. Although the Water Plan does not address additional developments of sources for agricultural water, it does not subtract from or jeopardize existing sources of agricultural water.

General Recommendation C.

> *The working group recommends that DHHL's water needs, which are currently tied to lands at Hoolehua and Kalamaula through 2010, be reserved first.*

Use of Well 17 at currently permitted levels does not interfere with or jeopardize existing water sources serving DHHL lands and preserves DHHL's reservation of 2.905 mgd of ground water in the Kualapuu Aquifer. A showing that withdrawal of 1 mgd of brackish water from the Kakalahale Well would not jeopardize DHHL's ability to access its

reservation in the Kualapuu Aquifer will have to be made to the Water Commission in order to obtain a water use permit for that source.

General Recommendation D.

> *The working group recommends that due to limited information, the capacity of the aquifers should be treated conservatively and protected until more precise determinations can be made.*

In line with this recommendation, the sustainable yield of the Kualapuu Aquifer was reduced from 7 to 5 mgd. The ground water withdrawals proposed in the Water Plan are well within the sustainable yields of the respective aquifers.

General Recommendation G

> *The working group recommends that ground water must be reserved first to fulfill domestic, and public health, safety, and welfare needs.*

Of the 1.018 mgd water allocation permitted by the Water Commission for Well 17, about half is for irrigation purposes. Under the Water Plan, potable groundwater withdrawn from Well 17 will not be used for irrigation, but instead will be used for existing and future domestic water needs, which is clearly in line with the Water Working Group's General Recommendation G.

General Recommendation H.

> *The working group recommends priority use of non-potable water should be for demonstrable and reasonable-beneficial agricultural usage which includes subsistence farming and public facility needs.*

Although the Water Plan does not address additional developments of sources for agricultural water, it does not subtract from or jeopardize existing sources of agricultural water. Additionally, by utilizing reclaimed effluent to irrigate the golf course and capturing rain and surface water on individual house lots for irrigation, there will be less competition with agriculture for other non-potable water resources.

General Recommendation I

> *The working group recommends use of any water for golf courses should be lowest priority*

The water use permit granted for withdrawal of ground water from Well 17 does not comport with the working group's General Recommendation I inasmuch as potable water is allocated for golf course irrigation. The Water Plan, on the other hand, calls for non-potable water, developed from the Kakalahale well, instead of potable water from Well 17, to be used for

irrigation. Furthermore, future plans are to use even lower quality water, i.e., reclaimed water from the sewage treatment plant, for golf course irrigation.

General Recommendation K.

> *The working group recommends that all additional water supply should first be sought in the Sector for which is shall be used.*

Due to the lack of water resources in the West Sector, water for the reopening of the Kaluakoi Resort and for the Laau Point development will have to be imported from other sectors.

General Recommendation L.

> *The working group recommends that all the water rights of DHHL homesteaders as provided under the Hawaiian Homes Commission Act, State Water Code, and other laws must be recognized and preserved by the State of Hawaii and the Counties of Maui and Kalawao. Other rights which may exist pertaining to Hawaiians not residing on DHHL lands must also be honored.*

See the discussion in Section VI.B.4, above, as to the consistency of the Water Plan with the rights of DHHL.

General Recommendation M.

> *The working group recommends that principles of supply and demand management be followed to the greatest extent allowed by law.*

General Recommendation N.

> *The working group recommends that new water supplies should be sought first through conservation management tools such as water pricing (inverted rate structure, etc.)*

Central Sector, Recommendation B.1

> *Bulk groundwater allocations should generally coincide with the "2010 Potable Water Use Projections" subject to on-going studies of the aquifer's capacity (see Exhibit 4).*

Although the uses listed on the Exhibit 4 are outdated, the estimated amount of long-term water use under the Water Plan is less than projected in the 2010 Potable Water Use Projections.

Central Sector, Recommendation B.2

Limit groundwater withdrawal in the Kualapuu Aquifer System to 5.0 mgd. 0.57 mgd (5.0 mgd limit minus 4.43 mgd 2010 Water Projections) may be used to satisfy other correlative uses unless subsequent information changes this.

Subsequent to the Water Working Group report, the sustainable yield of the Kualapuu Aquifer was reduced from 7 to 5 mgd. The Water Plan does not propose additional development of water from the Kualapuu Aquifer beyond what is already developed and permitted from Well 17.

Southeast Sector, Recommendation C.1

Limit groundwater withdrawal to 33% of its developable yield subject to verification of existing users and water use permits.

The combined sustainable yield for the four aquifer systems in the Southeast Aquifer Sector is 24 mgd. Currently permitted uses is less than 1 mgd. Additionally, under the Water Plan, Waiola intends to abandon plans to develop its Kamiloloa well. Developing the 1 mgd Kakalahale brackish water well would be well within the limitations of this Recommendation.

Southeast Sector, Recommendation C.2

Any withdrawals from this Sector should not diminish water supplies and supply availability for traditional uses, including taro patches and fishponds. Baseline water requirements for these uses needs to be determined.

Prior to utilizing the Kakalahale Well as a nonpotable water source, a water use permit from the Water Commission will have to be obtained. In that process, it will have to be shown that withdrawal of 1 mgd of brackish water from the Kakalahale well will not abridge traditional and customary native Hawaiian rights, including rights involving the use of taro patches and fishponds.

Southeast Sector, Recommendation C.3

Development of additional water from the Southeast Sector should be allocated first to existing residences of this Sector that are not yet served.

Prior testing of the Kakalahale well showed that it would not produce potable water. Thus the well site would not be suitable for development of water to serve existing residences.

C. Conclusion

Certain findings and decisions, especially with respect to development of the Kakalahale Well will have to be the subject of future findings and decisions by the Water Commission. Thus, a definitive answer cannot be given at this time as to the whether MPL will be able to

implement all components of the Water Plan. However, given the available information, and the progressive character of the Water Plan, the likelihood is very high that the Water Plan will receive regulatory approvals.

ENDNOTES

[1] Issuance of this permit was the subject of a contested case proceeding, referred to as the Kukui (Molokai) case. The case has been appealed to the Hawaii Supreme Court. As of this writing, the supreme court has not rendered a decision on this matter.

[2] U.S. Geological Survey, *Geohydrology and Numerical Simulation of the Ground-Water Flow System of Molokai, Hawaii, U.S. Geological Survey Water-Resources Investigations Report 97-4176 (1997)* (hereafter "USGS 1997 Study"), at p. 2.

[3] State of Hawaii, Department of Land and Natural Resources Division of Water and Land Development, *Water Resources Development: Molokai, Bulletin B16*, (Feb. 1966) (hereafter "Bulletin B16"), at p. xii-xiii.

[4] Information for this subsection is drawn primarily from George A.L. Yuen & Associates, Inc., *Hawaii Water Plan: Water Resources Protection Plan*, prepared for the Commission on Water Resource Management (June 1990), Vol. I, V-1.

[5] Hawaii Cooperative Park Service Unit, Western Region Natural Resources and Research Division, National Park Service, for the Commission on Water Resource Management, *Hawaii Stream Assessment: A Preliminary Appraisal of Hawaii's Stream Resources, Report R84* (December 1990) (hereafter "Hawaii Stream Assessment"), at p. 9.

[6] *Bulletin B16*, at p. xii.

[7] *USGS 1997 Study* at *p. 15.*

[8] *Bulletin B16*, at p. xii.

[9] *Hawaii Stream Assessment* at p. 55-56.

[10] *Bulletin B16* at p. xiv; *USGS 1997 Study* at *p. 13.*

[11] *Bulletin B16* at p. xiv; *USGS 1997 Study* at *p. 13.*

[12] Fukunaga & Associates, Inc., for County of Maui Department of Water Supply, *Molokai Integrated Water System Study* (Dec. 1989) at 5-6.

[13] **HRS §168-4 Preference.** To the extent that the same may be necessary from time to time for the satisfaction of their water needs, domestic and agricultural, the Hawaiian homes commission and lessees of the Hawaiian homes commission shall at all times, upon actual need therefor being shown to the board of agriculture, have a prior right to two-thirds of the water developed for the Molokai irrigation and water utilization project by the tunnel development extending to Waikolu valley and ground water developed west of Waikolu valley, which was planned by the board of land and natural resources as the first stage of the Molokai irrigation project.

[14] *Ko'olau Agricultural Co., Ltd. v. Commission on Water Resource Management (hereafter "Ko'olau Ag")*, 83 Haw. 484 (1996).

[15] HRS § 174C-48(a). However, no permit is required for domestic consumption by individual users.

[16] HRS § 174C-50(c).

[17] HRS § 174C-50(b).

[18] See endnote 1.

[19] Technically, this is not a permitted allocation because the Hawaii supreme court vacated and remanded the Water Commission's decision for further proceedings.

[20] There are no surface water management areas anywhere in the State.

[21] Hawaii Administrative Rule (HAR) § 13-168-32(a).

[22] HAR § 13-168-32(d) and §13-169-52(c).

[23] HAR § 13-168-32(e) and 13-169-52(c).

[24] HAR § 13-168-32(d)(2) and § 13-169-52(c)(2).

[25] HRS § 174C-3.

[26] HRS § 174C-3.

[27] HAR § 13-168-47.

[28] See *In the Matter of the Water Use Permit Applications*, 94 Haw. 97, 150 (footnote 54) (2000) (hereafter "Waiahole I").

[29] Similarly, in the Waiahole Ditch case, Gentry's application for a water use permit for golf course irrigation was denied on the basis that the lands on which the water was to be used had not yet been zoned for golf course use.

[30] *Waiahole I*, 94 Haw. at 161; *In the Matter of Water Use Permit Applications*, 105 Haw. 1, 15 (2004) (hereafter "Waiahole II").

[31] *Waiahole II*, 105 Haw. at 19.

[32] *Ko`olau Ag*, 83 Haw. at 491.

[33] 30 Haw. 912 (1929)

[34] *Id.* at 923.

[35] *Waiahole I*, 94 Haw. at 179.

[36] 65 Haw. 531 (1982)

[37] *Id.* at 553.

[38] *McBryde Sugar Company, Limited v. Robinson*, 54 Haw. 174 (1973).

[39] *Reppun v. Board of Water Suppply*, 65 Haw. 531 (1982).

[40] Section 221 of the Hawaiian Homes Commission Act reads as follows:

§221. Water. (a) When used in this section:

(1) The term "water license" means any license issued by the board of land and natural resources granting to any person the right to the use of government-owned water; and

(2) The term "surplus water" means so much of any government-owned water covered by a water license or so much of any privately owned water as is in excess of the quantity required for the use of the licensee or owner, respectively.

(b) All water licenses issued after the passage of this Act shall be deemed subject to the condition, whether or not stipulated in the license, that the licensee shall, upon the demand of the department, grant to it the right to use, free of all charge, any water which the department deems necessary adequately to supply the livestock, aquaculture operations, agriculture operations, or domestic needs of individuals upon any tract.

(c) In order adequately to supply livestock, the aquaculture operations, the agriculture operations, or the domestic needs of individuals upon any tract, the department is authorized (1) to use, free of all charge, government-owned water not covered by any water license or covered by a water license issued after the passage of this Act or covered by a water license issued previous to the passage of this Act but containing a reservation of such water for the benefit of the public, and (2) to contract with any person for the right to use or to acquire, under eminent domain proceedings similar, as near as may be, to the proceedings provided in respect to land by sections 101-10 to 101-34, Hawaii Revised Statutes, the right to use any privately owned surplus water or any government-owned surplus water covered by a water license issued previous to the passage of this Act, but not containing a reservation of such water for the benefit of the public. Any such requirement shall be held to be for a public use and purpose. The department may institute the eminent domain proceedings in its own name.

(d) The department is authorized, for the additional purpose of adequately irrigating any tract, to use, free of all charge, government-owned surplus water tributary to the Waimea river upon the island of Kauai, not covered by a water license or covered by a water license issued after July 9, 1921. Any water license issued after that date and covering any such government-owned water shall be deemed subject to the condition, whether or not stipulated therein, that the licensee shall, upon the demand of the department, grant to it the right to use, free of all charge, any of the surplus water tributary to the Waimea river upon the island of Kauai, which is covered by the license and which the department deems necessary for the additional purpose of adequately irrigating any tract.

Any funds which may be appropriated by Congress as a grant-in-aid for the construction of an irrigation and water utilization system on the island of Molokai designed to serve Hawaiian home lands, and which are not required to be reimbursed to the federal government, shall be deemed to be payment in advance by the department and lessees of the department of charges to be made to them for the construction of such system and shall be credited against such charges when made.

(e) All rights conferred on the department by this section to use, contract for, or acquire the use of water shall be deemed to include the right to use, contract for, or acquire the use of any ditch or pipeline constructed for the distribution and control of such water and necessary to such use by the department.

(f) Water systems in the exclusive control of the department shall remain under its exclusive control; provided that the department may negotiate an agreement to provide for the maintenance of the water system and the

billing and collection of user fees. If any provision or the application of that provision is inconsistent with provisions contained in this section, this section shall control.

Water systems include all real and personal property together with all improvements to such systems acquired or constructed by the department for the distribution and control of water for domestic or agricultural use.

[41] *In the Matter of the Contested Case Hearing on Water Use, Well Construction, and Pump Installation Permit Applications*, 103 Haw. 401, 430 (2004) (hereafter "Wai`ola") (citations, quotations, and editing signals omitted).

[42] *Waiahole I*, 94 Haw. at 136.

[43] *Waiahole I*, 94 Haw. at 136-137; *Wai`ola*, 103 Haw. at 431.

[44] County of Maui Department of Water Supply and Planning Department, *Hawaii Water Plan: Maui County Water Use and Development Plan,* March 1990, at pp. 36-41.

[45] When the Water Commission rendered its decision granting the water use permit for Well 17, MPL was not affiliated with Well 17 or MPU. Also, the requirement of conducting an alternative sources analysis was clarified in 2004, when the Hawaii supreme court issued its Waiahole II decision, long after the Water Commission's decision in the Kukui (Molokai) case.

[46] *Wai`ola*, 103 Haw. at 401.

APPENDICES

Appendix A Molokai Properties, Limited, EC Project #47: Water Plan, December 2004

Appendix B Report of the Molokai Water Working Group, Revised April 1996

MOLOKAI PROPERTIES, LIMITED

EC PROJECT #47

WATER PLAN

DECEMBER 2004

Revised October 2005

APPENDIX A

WATER USE PLAN

I. Molokai Properties, Limited Existing Water Systems

Molokai Properties, Limited (MPL) operates 3 water systems, two of which are subject to State Public Utilities Commission (PUC) regulation. All three systems are subject to regulation by the State's Commission on Water Resource Management (CWRM).

II. Kaluakoi System (Molokai Public Utilities, Inc. (MPU)

MPU services the existing Kaluakoi Development. Its source is Well 17 in Kualapuu which has a water use allocation of 1,018,000 gallons per day (GPD). The following is the permitted allocation established by the Water Commission based on the then existing uses:

Kaluako'i Hotel	67,000
Condos	186,000
Residential	51,000
Golf Course	400,000
Beach Park	26,000
Nursery	18,000
Filter Backwash	100,000
Moloka'i Ranch	0
System loss	0
Kaluako'i Total	**848,000**
MIS System Use Charge	94,000
Kualapu'u Town	76,000
Total	**1,018,000**

In this paper "current use" is defined as the average daily use over a one-year period. Current use of the MPU system, with the Kaluakoi Hotel closed is approximately 800,000 GPD.

At the time the Kaluakoi System was acquired by MPL in December 2001 it had been out of full compliance with Department of Health Drinking Water Standards since 1993. Those standards, which went into effect nation-wide, required drinking water systems using surface water or systems using groundwater under the influence of surface water to meet higher water quality standards to provide a greater margin of safety to their customers.

That non-compliance led to a Consent Order that MPL inherited from the previous owners of Kaluakoi. At the time of acquisition, the compliance deadline was extended to September 15, 2004. A one-year extension was subsequently requested and approved. MPL could have satisfied the Consent order by either using a dedicated pipeline from Well 17 (an alternative that was abandoned) or by installing new treatment facilities that could meet the current standards. New filtration equipment was installed and became operational on September 14, 2005.

Essentially, MPU starts with clean, compliant water as it leaves Well 17. However, use of the Molokai Irrigation System (MIS) to convey this water to the west end mixes in surface water creating the need for treatment to again make it safe for drinking water purposes.

III. Existing System Losses

Much has been said about MPU's system losses and we acknowledge that the system we inherited had losses of approximately 200,000 gallons per day.

Prior to the upgrade, the largest water loss was the approximate 100,000 gallons per day consumed in backwashing the sand filters at Puu Okoli that were part of the system MPL inherited. The old Ag lines and the open reservoir between Mahana and the entrance to Kaluakoi were also historically large water wasters. Completion of the system upgrade allowed 17,500 lineal feet of this old pipeline to be removed from service.

All systems have some level of loss. Most systems aim for losses of about 10%---- a reasonable target for the Kaluakoi System at build-out.

IV. Waiola O Molokai, Inc. Systems

Waiola is the Public Utilities Commission regulated entity that supplies drinking water to the remaining communities on Molokai Ranch land.

The Ranch has been in the water business for more than 100 years. Its role in this area expanded significantly when it inherited the drinking water systems for Maunaloa and Kualapuu when their lessees abandoned those plantation towns.

Waiola also supplies water to Kalae/Kipu and the Molokai Industrial Park/Manawainui areas. Prior to 1993, all of this water was supplied from the Ranch's surface water system. With the imposition of more stringent standards, these systems shifted from surface water to purchased well water.

The Kipu/Kalae system (approximately 20,000 gallons per day) is supplied with well water purchased from the Department of Hawaiian Homelands (DHHL).

The Kualapuu system (76,000 gallons per day as noted above) is supplied from Well 17 via a bulk water purchase agreement with MPU.

Initially, Maunaloa and the Industrial Park were supplied with water purchased from the County Board of Water Supply, from its well in Kualapuu. When that agreement came to an end in May 1998, MRL built a new treatment facility that meets the new standards.

V. Molokai Ranch Mountain (AG) system

The initial water system of the Ranch is more 100 years old and moves surface water approximately 20 miles from the central mountains of Molokai to the far corners of MPL's holdings through a combination of six and eight inch pipelines. Currently, the surface water system has 3 primary uses:
1.) Feed water for the Puu Nana water treatment plant that provides potable water for Maunaloa and the Industrial Park;
2) Irrigation water for landscaping of Maunaloa Village, the Lodge and Kaupoa camp;
3) Water for the Ranch's livestock operations.

The system has an average yield of approximately 500,000 gallons per day, but as with all surface water systems, its yield is highly weather dependent. Seasonal flows of 1,300,000 gallons per day can be achieved during winter storms, while summer drought lows of 65,000 gallons per day have occurred.

In many ways the Ranch's surface water system is like its much larger counterpart on Molokai, the MIS, which is also a surface water system.

While numbers vary, one estimate of the average yield of the MIS is 3,500,000 GPD making it about seven times larger than the ranch system in terms of yield. In terms of storage, the Ranch's 44,000,000 gallons of storage pales in comparison to the MIS's 1.4 billion gallons which is more than 30 times greater.

Both are highly dependent on the weather and rely heavily on winter rains to sustain demand during the drier summer months. One area of difference between the two systems is the MIS's ability to pump high-level ground water to supplement gravity surface water flows while the Ranch system relies totally on surface water delivered by gravity.

Surface water is the basis for our agricultural industry on Molokai as it is much cheaper to deliver to customers.

The typical energy costs for MPU to raise water 1,000 feet to the surface (the elevation of the Kualapuu Wells) is $1.00 per 1,000 gallons. Without high energy costs, water from Molokai's existing surface water systems can be kept affordable which is a critical factor to the future of farming on Molokai.

Inexpensive water is the key to expanding agriculture on Molokai and Molokai Ranch supports this wholeheartedly.

VI. MPL and the MIS

Since the first days of the Kaluakoi development, transmission of Well 17 water to the Resort utilized the MIS distribution system and the old Libby, McNeill & Libby irrigation pumps, pipelines, and reservoirs. These pipelines are 24 inch from the MIS reservoir to beyond the Kaluakoi reservoir at Puu Nana.

Currently MPU leases MIS transmission capacity for $135,000 per year. Based on current usage, that is equivalent to about 51 cents per 1,000 gallons for the right to use a portion of the excess capacity of the existing infrastructure. Other users pay 31.5c per 1000 gallons, plus an acreage assessment. To our knowledge, the Ranch is the largest financial contributor to the system.

In addition MPU "pays" the MIS "a systems loss" equal to 10% of the water it transmits.

MPU does not use MIS water. It puts in 1,111,111 gallons of water for every 1,000,000 gallons it takes out at its Mahana pump station. Over the course of a year, this additional input amounts to about 30,000,000 gallons.

When we acquired the assets of Kukui (Molokai), Inc. and MPU in December 2001, Kukui had a pumping deficit of 30,000,000 gallons. We made up this deficit by mid February 2002.

Since then, we have been in arrears only once, between April 5 to August 19, 2004. It was the result of the change-out of the old Detroit diesel engine with a new Caterpillar four-stroke diesel that is expected to be a more reliable power unit to drive the Well 17 pump. In hindsight, we should have built up greater reserves prior to taking the Well 17 motor out of commission.

This breakdown has, quite rightly, raised concern from homesteaders that a future breakdown could lead to a similar occurrence.

MPL proposes that it advances the MIS system 100 million gallons and retains that surplus in the system at all times. That amount of water would equate to about 4 feet of depth out of the 52 feet of usable storage capacity.

In the event of any future breakdown at Well 17, this surplus would more than cover any conceivable repair time.

MPL also proposes that preference farmers are able to use this surplus in the event of a drought emergency.

VII. Water Needs Going Forward

We have stated that MPL **DOES NOT** need any more drinking water than currently allocated for the proposed Master Use Plan.

Under this Plan, MPL will abandon the Waiola Well application.

If this Plan is approved, MPL will sign covenants preventing it from ever seeking further water permits from the Water Commission.

This Master Use Plan is proposing:

(a) Potable Water:

MPL retains its 1.5 million gallons per day of water currently allocated:

- 1,018,000 GPD from Well 17
- 500,000 GPD from the Mountain System.

(b) Non-Potable Water

It is proposing to develop 1,000,000 GPD from the abandoned Kakalahale brackish water well in the Kamiloloa aquifer sector for future non-potable needs.

By gradually moving current non-potable uses such as the golf course, irrigation of the hotel, condos and large lots to non-potable water, we believe our existing 1.5 GPD potable allocation from a combination of Well 17 and the mountain system will meet all of our long-term potable demand.

Non-potable needs can be supplied by a combination of use of our existing mountain system and the unused Kakalahale Well.

We have proposed that the remaining 1,000,000 GPD be drawn from the Kakalahale brackish water well. This well which was built by Kaluakoi Corporation in 1969, has been pump tested and demonstrated capable of providing 1,000,000 GPD of good quality brackish water (chlorides at 500 ppm, or twice the drinking water standards).

Our advice is that drawing water from the Kakalahale well will have no impact on the yield of the Kualapuu aquifer.

While concerns have been raised about its use by the MIS or on DHHL lands, we believe it is a good source for west end irrigation needs.

We WILL NOT propose transmission of the Kakalahale brackish water to the West End by the MIS system.

We are currently investigating transmission alternatives.

Why is this Plan so different from previous West End water proposals?

Previously three separate large land owners, Molokai Ranch, Alpha USA and Kukui (Molokai) Inc all had or were developing massive comprehensive development plans that would have required as much as a total of 20,000,000 gallons of water per day to support.

Because our proposed Master Plan limits development, proposed water use is subsequently dramatically reduced as the table below shows.

VIII. Laau Point Water Use

The proposed Laau Point project, like the Papohaku Ranchlands subdivision, is expected to comprise second and third homes whose owners spend a limited amount of time on island. At Papohaku, 60% of those who have built houses are not permanent residents.

Also like Papohaku, we would expect actual dwelling construction to lag lot sales by several years. To date, about 20% of lots in Kaluakoi have been built on. After more than twenty years, the build-out rate is less than one percent per year as an average. We believe a combination of low occupancy, water conservation education, xeriscaping and tiered water rates will moderate water consumption by these homeowners.

While we expect home construction to be slow, water demands during the construction period are expected to be in the order of 50,000-150,000 gallons per day. Initial erosion protection and control measures would likely require an additional 50,000-100,000 gallons per day as well. The construction phase is projected to be 2 years. The initial erosion control phase would be expected to continue well after construction ranging from 5 to 10 years.

The public park(s) would require potable water and non-potable water for irrigation concurrent with the completion of site construction.

We anticipate it would be several years into the sales of the project before wastewater recycling would be a significant contribution to the supply of irrigation water for landscaping features, erosion etc. In the interim, non-potable water not required for unbuilt house lots would support these uses.

In summary, we would expect that water use for the project would start out as a significant percentage of total demand then drop after completion of construction and then slowly rise again as home construction proceeded.

IX. Water Usage Under Proposed Master Plan

(In Gallons Per Day)

CURRENT WATER USE

DESCRIPTION	Potable	Potable Irrigation use	Non-Potable
Kaluakoi Hotel & Golf Course	2,000	405,120	
Kaluakoi Condos	116,250	70,880	
Kaluakoi Residential	70,500	143,825	
Maunaloa/Industrial Park	136,370		25,480
Ranch Operations/ Misc.	41,500		150,000
Kualapuu	76,000		
Subtotal	**442,620**	**619,825**	**175,480**
TOTAL POTABLE		**1,062,445**	
Total Potable & Non-Potable Categories			**1,237,925**

FULLY DEVELOPED WATER USE

DESCRIPTION	Potable		Non-Potable
Current and Future Changes (within 50 years)			
Kaluakoi Hotel & Golf Course	33,400		273,240
Golf Course Wastewater Reuse			-100,000
Kaluakoi Condos	116,250		70,880
Kaluakoi Residential	228,500		633,825
Maunaloa/Industrial Park	296,870		25,480
Ranch Operations/Misc.	41,500		150,000
Laau Point Lots	96,000		300,000
Laau Point Parks	1,000		40,000
TOTALS	**889,250**		**1,393,425**
Long term growth > than 50 yrs			
Community directed growth in Kualapuu and Maunaloa	200,000		
TOTALS	**1,089,520**		**1,393,425**
TOTAL ALL USES			**2,482,945**

We have stated that our projected West End water use will not exceed our existing permits plus 1.0 MGD of brackish water from the Kakalahale Well. Current use is grouped into 3 types of water; potable, potable irrigation, and non-potable. Currently 619,825 GPD of irrigation demand is met with potable water.

This use will be shifted to non-potable sources over time, freeing up this water for new potable uses. Renovation of the golf course (130 acres of turf down to 80 acres of turf) will reduce water consumption and reopening of the Hotel and higher condo occupancies will provide more wastewater. This is reflected in the much-reduced demand for golf course and hotel irrigation.

The La'au potable allocation is based on 600 GPD for 200 lots at 80% occupancy. The non-potable water is based on 1,500 GDP for 200 lots.

X. The Role of Water Conservation

At the time of the Kaluakoi acquisition, we understood that water conservation would play an important role in managing the West End's water usage.

The Water Commission reinforced that understanding in its water use permit for Well 17 that was issued after we took title to the Kaluakoi assets.

The Commission required MPU to report on its progress in controlling water waste, to conduct an educational campaign on water conservation with its customers, and to investigate a non-potable source for the golf course to allow potable water being used for non-potable uses to be available for other potable purposes.

We immediately identified and corrected several long-term water waste issues. We conducted a water conservation campaign over 12 months. However the most important action undertaken to date has been to restructure MPU's water rates to properly reflect the true cost of providing this service and to implement tiered water conservation rates that provide a financial incentive to customers to conserve water.

We approached our rate structure by using the Water Commission allocation amounts by user type as the base rate. All water use above that amount would be billed at a much higher "conservation rate". We proposed that the base rate be $3.18 per 1000 gallons and the conservation rate be twice as much or $6.36 per thousand gallons.

As an example, the Water Commission used 560 gallons per unit for the Condos plus 2,000 gallons per day per acre for irrigation. A 50-unit condo on a 4-acre site would have 36,000 gallons per day in its base rate (560 gallons X 40 units plus 2,000 gallons X 4 acres for irrigation). Any water used above this amount would be sold at the higher conservation rate.

As the permit allocation amount was 1,000 gallons per day for all residential uses (even though the existing usage in the Papohaku Ranchlands was noted in the permit to be 5,308 gallons per day per residence), we proposed that the conservation rate begin at 1,000 gallons per day for residential customers.

Because of a concern the Consumer Advocate termed "rate shock", we agreed to reduce the conservation rate to $4.70 per 1,000 gallons and phase-in the conservation rate for residential customers. For residential customers the conservation rate applies to all water used in excess of 5,000 gallons per day.

However the Consumer Advocate and the Public Utilities Commission agreed that we could telegraph that our next rate increase – then anticipated to be two to three years away-- would likely see the conservation rate take effect for all residential water use in excess of 1,000 gallons per day.

For the most part Kaluakoi residents have adjusted their water use. Consumption has dropped by 45% in the Ranchlands and the condos have shown reduced water consumption as well since the rate hike in September 2003. The most notable change is that customers now respond to rainfall and shut off their irrigation systems. Previously we saw very little reduction in water use after a good rain. Now a passing shower will cause water consumption to drop dramatically.

XI. Contingency Planning

We have stated that the 2.5 million gallons of water per day is the maximum this community-based Master Plan will require; 1.0 million gallons of existing drinking water from Well 17, and 0.5 MGD from the Mountain System, and one million gallons of brackish water from the Kakalahale Well.

The question has been posed; what if the Plan needs more water? What if there is increased demand for agriculture, particularly on MPL lands designated for agriculture, or on lands to be donated to the land trust.

MPL will never go back to the community and seek more drinking water.

If more non-potable water is needed for agriculture in particular, we still have two options:

- The brackish water available to MPL from the Prawn Farm at Palaau, which is currently permitted for 864,000 gallons per day of which 500,000 gallons per day could be available for reuse.
- Desalination.

The Prawn Farm water is very brackish; 1300 parts per million as chlorides (drinking water must have no more than 250 parts per million), and it would three times as expensive to remove the salts to bring it to an acceptable level for use as agricultural water as obtaining water from the Kakalahale Well.

But it is an option for the future and particularly for non-potable uses.

Currently, desalting is still about 4 times more expensive on Molokai than developing an operating deep groundwater well. While it is not a viable economic alternative today, this technology continues to improve and its costs are declining as a result.

As this technology continues to improve, the cost of producing water will come down. As our conservation rates go up, at some point the two lines will cross, and we will find the balance between demand and supply. We have talked about the ability to have multiple rate blocks for both potable and non-potable water.

Structured properly, these rates would, in effect, subsidize prudent or thrifty water users and penalize excessive water use. At the higher rate blocks, the cost of desalination can be recovered. Because of this, there would be no pressure to pursue additional groundwater or surface water sources from the central or east end of the island.

XII. Water and Hawaiian Rights

Every water use permit issued by the Water Commission contains a provision that the allocation will be reduced if it interferes with the rights of the Department of Hawaiian Homelands.

The water code states that each County's Water Use and Development Plan, and the State's Water Project Plan, "shall incorporate the current and foreseeable needs of DHHL".

Hawaii revised statutes provides that the Hawaiian Homes Commission and its lessees have a prior right to 2/3 of the water in the MIS. Supreme Court rulings have affirmed that the priority uses of water include Native Hawaiian and traditional and customary rights.

For Molokai Properties Limited, the issue of Hawaiian Water Rights is very clear; our existing allocations are subject to reduction if they interfere with DHHL's rights to water in the future and due consideration must be given to DHHL's projected needs with any proposed new allocations.

Essentially we have proposed in our Master Plan to forever limit our withdrawals of potable groundwater to that which has already been permitted and seek only one million gallons per day of non-potable water from the existing proven brackish Kakalahale well in the Kamiloloa aquifer sector.

In essence, we are requesting 2 million gallons of groundwater out of the estimated developable 33.5 million gallon estimated sustainable yield of the island (about 6%), in the knowledge that it could be reduced in the future if necessary for DHHL's needs to be met. As we see it, it's a matter of law.

So we believe that if DHHL used every reasonable effort to develop its 2.905 MGD allocation in Kualapuu and wasn't successful, the Water Commission would then be obligated to reduce our allocation as necessary so that DHHL would get the full benefit of their allocation at the time it was needed.

We do not believe that scenario will eventuate because:

1) We believe the work done by the USGS supports that the estimates of water availability will be realized.
2) There is a strong consensus on island to limit development that will limit total water demand.
3) Large quantities of groundwater for agriculture will be cost prohibitive.

REPORT OF THE MOLOKAI WATER WORKING GROUP

Revised April 1996

Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii

Originally Presented July 1993

APPENDIX B

PETER S. ADLER & STANLEY LUM
Facilitators

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July 31, 1996

Michael Wilson, Chairman, and
Members of the Commission on Water Resource Management
Department of Land & natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Commissioners:

We are pleased to convey to you the results of the second round of discussions by the Molokai Working Group which was initiated by you in November, 1995 and which concluded its meetings on April 30, 1996.

As you recall, the group reconvened for the express purpose of revisiting and updating the initial report issued in July, 1993. The group was expanded to include additional representation from community, development, agricultural and homestead interests. The report does not make wholesale changes to the work of the original Molokai Working Group. Instead, you will find certain additions, modifications and deletions that, in the eyes of the group, improve the substance and clarity of the report's intent.

Once again, we applaud the efforts of the group's members who spent many hours in tough conversations searching for the highest levels of consensus possible. Where they have achieved such consensus, we hope it will prove useful to the Commission. Finally, we want to express our personal thanks to all those who entered these lengthy discussions in the spirit of good will and collaborative problem solving.

Sincerely yours,

PETER ADLER

STANLEY LUM

MOLOKAI WORKING GROUP MEMBERSHIP

1993	1996
JUDY CAPARIDA Mana'e Resident	JUDY CAPARIDA Mana'e Resident
WARREN HAIGHT West End Landowners	DUNCAN ANNANDALE Moloka'i Ranch
BEN HENDERSON Dept. Hawaiian Home Lands	KEONI AGARD Dept. Hawaiian Home Lands
ALAN HOLT The Nature Conservancy	ED MISAKI The Nature Conservancy
LARRY JEFTS Commercial Farmer	TOM DECOURCY Commercial Farmer
BOB JOHNSON Maui County Administration	WILL SPENCE Maui County Administration
NOELANI JOY Hawaiian Homesteader	NOELANI JOY Hawaiian Homesteader
PAT KAWANO Maui County Council	PAT KAWANO Maui County Council
COLETTE MACHADO Mana'e Resident	COLETTE MACHADO Mana'e Resident
WAYNE MEYER Mana'e Resident	WAYNE MEYER Mana'e Resident
WILLIAM PFEIL Commercial Farmer	WILLIAM PFEIL Commercial Farmer
WALTER RAGSDALE Moloka'i Planning Commission	WREN WESCOATT Moloka'i Planning Commission
DEGRAY VANDERBILT Kaunakakai Resident	DEGRAY VANDERBILT Kaunakakai Resident
	RON HEDANI Kukui (Moloka'i), Inc.
	GLENN TEVES Hawaiian Homesteader
	TOM MATAYOSHI Moloka'i Irrigation System
	ELLEN KRAFTSOW Maui Dept. of Water Supply

FACILITATORS

PETER ADLER
STANLEY LUM

STAFF

ERIC HIRANO
CHARLEY ICE

CONTENTS

List of Exhibits

Molokai Working Group

I. INTRODUCTION

The report that follows was originally presented in July 1993, following about six months of explorations and deliberations. It was revisited in late 1995 and revised in April 1996.

INTRODUCTION TO THE 1996 REVISED REPORT

This report by the second Moloka'i Water Working Group supercedes the first report done by the original Moloka'i Working Group in July 1993.

The second group was convened by CWRM Chairperson Michael Wilson in late 1995 for the express purpose of revisiting and updating the initial report issued in July 1993. The group was expanded to include additional representation from community, development, agricultural, and homestead interests (see Membership page). The group met seven times, heard presentations from experts, engaged in discussions and deliberations, and then reviewed the previous report with an eye towards updating and revising certain portions of it.

All changes to the original report are indicated in italics and only "consensus changes" have been included. We also note that most of the changes were developed at the group's last two meetings and, based on instructions by the group, were then written out by the facilitators and staff, circulated back to members to insure accuracy, and only then included in this report.

The result follows. The second Moloka'i Water Working Group did not make wholesale changes to the work of the original Working Group. Instead, Commissioners and other readers will find certain additions, modification, and deletions that, in the eyes of the group, improve the substance and clarity of the report's intent, and that can give general and sector-by-sector guidance to decision-makers.

The Moloka'i Water Working Group again gratefully acknowledges the assistance of many people who provided helpful time and information, including attorneys Doug McDougall and Alan Murakami and hydrologist Bill Meyer, for their good work on behalf of current and future generations of Moloka'i.

ORIGINAL INTRODUCTION

This report details the final findings and recommendations of the Molokai Working Group, a group appointed in October, 1992 by Mr. William Paty, recently retired Chairperson of the Commission on Water Resource Management (Commission). In his opening comments to the Molokai Working Group, Mr. Paty explained the group's purpose as follows:

- To recommend to the Commission a plan for water development on Molokai that assists the County and Community in developing its Water Use and Development Plan; and

- To test a community "working group" model that, if it works, could be used elsewhere in the State when communities are faced with tough water issues.

More specifically, Mr. Paty asked the Working Group to enter into good faith deliberations aimed at producing the highest consensus possible on demand forecasts, bulk water allocations, recommendations

to manage both supply and demand, and the best plans the Working Group might offer on balancing future water uses. Between November, 1992 and June, 1993, the group met ten times at various locations on the Island of Molokai. All meetings were open to the public and most were attended by one or more interested Molokaians.

To facilitate its own process, the Working Group developed and adopted a unique set of ground rules governing participation, attendance, and meeting courtesies (see Appendix A). Of particular importance was the group's initial agreement to operate by full consensus rather than through voting. The Working Group agreed that full consensus meant that any single individual could veto an item from going forward. This report, therefore, is forwarded to the Water Commission with the consensus of the entire Working Group.

It is hoped that the Commission on Water Resource Management will find this report helpful in identifying policy areas which should be addressed and which, if properly articulated, can aid greatly in shaping decisions bearing on water usage in the future.

Users of this report should keep four factors in mind when reading this report. First, the Molokai Working Group acknowledges that the data currently available provides an incomplete understanding of Molokai's water resources. Therefore, the group has taken a conservative approach, by generally accepting without revising water use projections submitted to the group.

Second, the report does not attempt to deal with every water issue being faced by the people of Molokai. Time and resource constraints, not to mention data constraints, required that the group focus only on those various supply and demand issues that seem most immediate and important at a policy level. Some of these issues must be reserved for when more complete information is available.

Third, the Working Group has not sought to suggest detailed allocations for the future. The hard work of choosing among different proposed users remains with the Commission. Nonetheless, the Working Group has sought to address the questions of what "principles" ought to have higher and lower priority in the balancing work that the Commission must inevitably do and these are reflected in the recommendations. The group has limited itself to the next 10-20 years as a "planning window" but tried also to provide fundamental guidelines about water use that can guide decisions for the future.

Fourth, the Working Group contained in its membership a reasonable cross-section of some of Molokai's various interest groups, however, many important voices did not, because of time and resource pressures, have an opportunity to participate in the Working Group's discussions. It is important, therefore, that all of Molokai's people be encouraged to share their views on the matters discussed in this report.

In responding to Mr. Paty's directive and submitting this report, the Working Group also wishes to acknowledge the need -- and express its desire -- to continue working together to help analyze and resolve four remaining "tough" issues. These are (1) groundwater and wellhead protection for Molokai; (2) Hawaiian and DHHL rights to water; (3) streamflow protection and possible restoration; and (4) Kualapuu wellfield protection. Until these issues are resolved, the Working Group's work remains meaningful and necessary and we hope the Commission will make every effort to enable the Working Group's continuing discussions.

It is also recommended that the Commission will convey to the Maui County Council, Maui County Administration, including the Board of Water Supply of the County, the State Department of Agriculture, and the State Department of Hawaiian Home Lands the concerns, findings, and recommendations contained herein.

The Molokai Working Group gratefully acknowledges the assistance of William Paty, Rae Loui, Ben Kudo, and Paul Matsuo who provided critical information and perspective at various points during the Working Group's meetings. Finally, the Group thanks the Commission for the opportunity to provide its views and encourages the Commission to continue such efforts on Molokai and on all of the other islands as well.

II. FINDINGS

A. Agriculture will continue to be the economic and cultural "heart" of Molokai.

B. *Sustainable yield of the Kualapu'u Aquifer appears to have been fully allocated in 1996.* The areas of greatest present & future conflict have to do with agricultural and recreational uses of water.

C. *While DLNR/DoWaLD Bulletin B16 (1966) estimated that* the island's sustainable yield was 83 mgd, *the 1993 Working Group agreed to work with a developable yield of 39 mgd for planning purposes (see Exhibit 1). In 1996, the Water Working Group has agreed to use an estimate of 41.5 mgd for planning purposes, which differs from the earlier figure as follows:*

1. *It includes 4.5 mgd already developed in the Waikolu System of the Northeast Sector;*
2. *It reduces the original estimate of 7 mgd in the Kualapu'u Aquifer System to 5 mgd.*

It should be noted that, of the 41.5 mgd, at least 8 mgd is brackish, leaving only 33.5 mgd developable sweet water.

D. The group has worked to gather estimates of existing uses, future demands, and supply and finds the following: (see Exhibits 2 - 5)

1. *1996 groundwater permitted usage is 8.59 MGD;*
2. *1996 surface water reported usage is 2.96 MGD;*
3. *The Department of Hawaiian Home Lands has a groundwater reservation of 2.905 MGD from the Kualapu'u Aquifer System;*
4. *1993 projected* potable water use for 2010 is estimated at 11.55 MGD;
5. *1993 projected* non-potable water use for 5-10 years is estimated at 20.52 MGD;
6. *1993 projected* non-potable water use from 2010 to "build out" is estimated at 42.90 MGD.
7. *Current use plus 1993* projections of water use exceed supply.

III. GENERAL RECOMMENDATIONS

A. The working group recommends *that the Commission initiate and coordinate* water resource studies to improve everyone's understanding of the available resources.

B. The working group recommends that all large-scale water planning/water management should consider that agriculture will continue to be the economic and cultural "heart" of Molokai.

C. The working group recommends that DHHL's water needs, which are currently tied to lands at Hoolehua and Kalamaula through 2010, be reserved first.

D. The working group recommends that due to limited information, the capacity of the aquifers should be treated conservatively and protected until more precise determinations can be made.

E. The working group recommends that priorities for water use should follow the lead of community development as determined by the intent of the Community Plan and DHHL development plans in force at the time the Commission makes its decision.

F. *The working group recommends that the Water Use and Development Plan follow these guidelines:*

1. *For planning and management:*

a) all wells and stream intakes should have meters, gages, or other measuring devices; withdrawals greater than 10,000 gpd should be reported monthly, including drawdown and salinity in wells, with instruments subject to periodic checks by CWRM staff; withdrawals up to 10,000 gpd should be recorded monthly and submitted annually, subject to periodic checks by CWRM staff.

b) Water Use Permit Aplications should include not only TMK, present designations and zoning, proposed use, and consumption standard; they should also include available historical consumption data.

2. Use a projected resident population *that complies with the Community Plan* as a guideline for planning county policies and services (1990 - Resident population, 6,700 ± Visitor population, 800 ± 2)

3. Retain Kaunakakai Town as the population center of the island;

4. Limit the visitor accommodation center to Kaluakoi;

5. Maintain agriculture as the primary economic activity;

6. Develop a comprehensive water system for agricultural use;

2. from West Maui Regional Capacity Study Project, October 1, 1992.

6. Develop a comprehensive water system for agricultural use;
7. Improve current water quality, distribution system, and develop new water sources for Molokai Community Plan areas;
8. *Incorporate a section on supply- and demand-side management, including* water conservation *incentives* and *public* awareness programs; and
9. Incorporate a program to maximize watershed quality, including the initiation of Maunaloa Mountain's reforestation.

G. The working group recommends that ground water must be reserved first to fulfill domestic, and public health, safety, and welfare needs.

H. The working group recommends priority use of non-potable water should be for demonstrable and reasonable-beneficial agricultural usage which includes subsistence farming *and public facility needs.*

I. The working group recommends use of any water for golf courses should be lowest priority.

J. The working group recommends that an intensive study be implemented to capture surface overflow during heavy rains from intermittent streams (Kamalo, Kawela, Kalae, Kaunakakai, Manawainui) for surface water use, increasing recharge of the associated aquifer, and decreasing siltation of Molokai's reefs.

K. The working group recommends that all additional water supply should first be sought in the Sector for which it shall be used.

L. The working group recommends that all the water rights of DHHL homesteaders as provided under the Hawaiian Homes Commission Act, State Water Code, *and other laws* must be recognized and preserved by the State of Hawaii and the Counties of Maui and Kalawao. Other rights which may exist pertaining to Hawaiians not residing on DHHL lands must also be honored.

M. The working group recommends that *principles of* supply and demand *management be followed* to the greatest extent allowed by law.

N. The working group recommends that new water supplies should be sought first through conservation *management tools such as water pricing (inverted rate structure, etc.).*

O. The working group recommends that Molokai should have a core of undisturbed watersheds.

P. The working group recommends that *local advice on* water resource issues be through a permanent entity similar in form and representation to the present Molokai Working Group.

Q. The Water Working Group recommends *that the 1996 version of the Final Report be revisited every two years, and at these times to include meetings or briefings* with the State Water Commission, County Council, Mayor, and Board of Water Supply *to discuss the group's updated report.*

IV. RECOMMENDATIONS BY SECTORS

A. NORTHEAST SECTOR

1. The development of new water resources from the undeveloped portions of the Northeast Sector should be held in reserve.
2. Existing uses (NPS, DOA, DHHL, DOH, etc.) should continue if they are consistent with the State Water Code.
3. Utilization of existing MIS capacity should be done cautiously with current monitoring. Development beyond the existing water systems in the Northeast Sector should not be allowed, unless assessments indicate more water can be withdrawn without further impacts to the natural ecosystems.

B. CENTRAL SECTOR

1. Bulk groundwater allocations should generally coincide with "2010 Potable Water Use Projections" subject to on-going studies of the aquifer's capacity (see Exhibit 4).
2. Limit groundwater withdrawal in the Kualapuu Aquifer System to 5.0 mgd. 0.57 mgd (5.0 mgd limit minus 4.43 mgd 2010 Water Projections) may be used to satisfy other correlative uses unless subsequent information changes this.
3. Groundwater withdrawal from the Kualapuu Aquifer System over the 5.0 mgd limit set in 2 above, may be exceeded by a maximum of 2.0 mgd only if DHHL requires additional resources and water quality is not threatened.
4. The Manawainui Aquifer System should be renamed to Palaau Aquifer System.

C. SOUTHEAST SECTOR

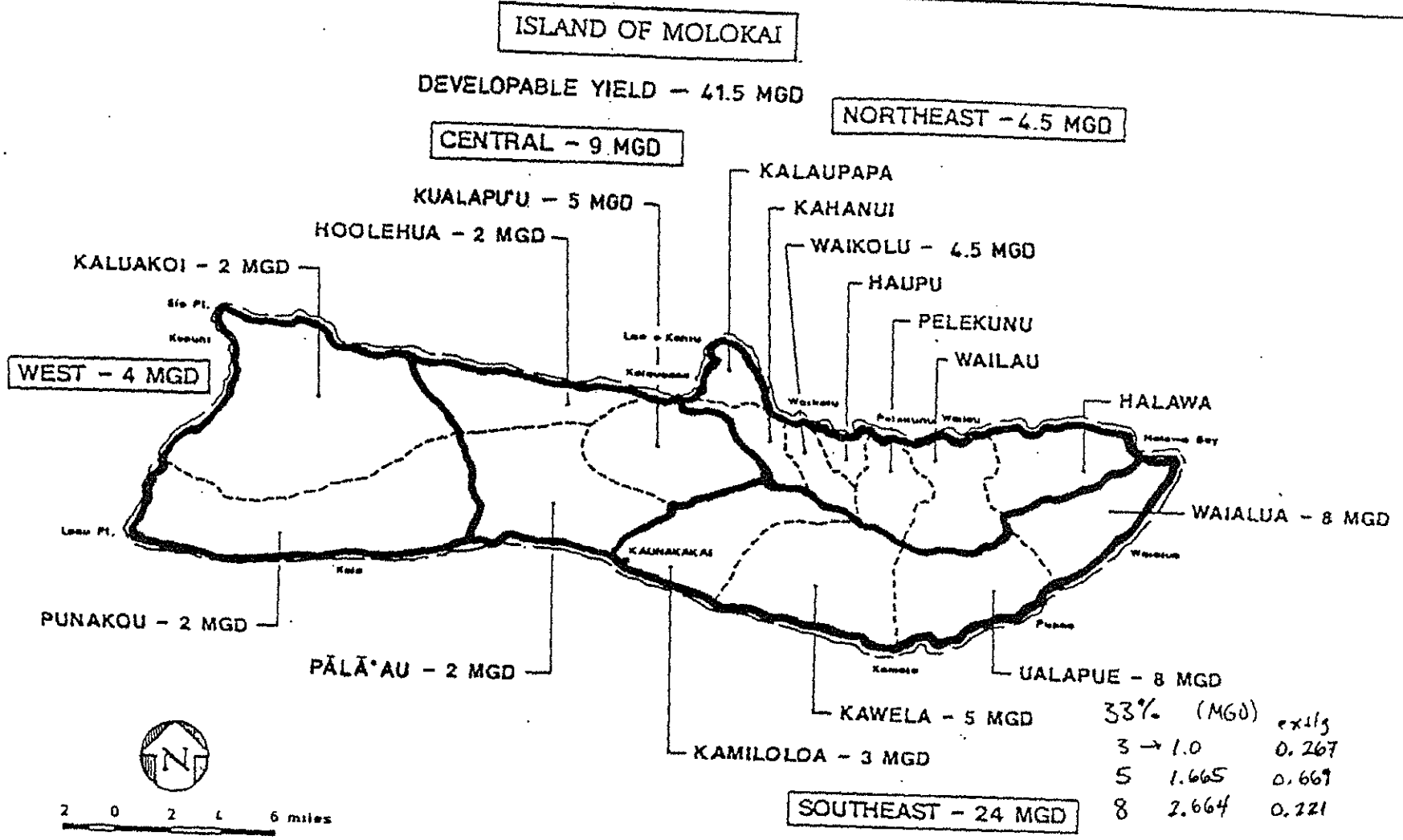
1. *Limit groundwater withdrawal to 33% of its developable yield* subject to verification of existing users and water use permits.

2. Any withdrawals from this Sector should not diminish water supplies and supply availability for traditional uses, including taro patches and fishponds. *Baseline water requirements for these uses needs to be determined.*

3. Development of additional water from the Southeast Sector should be *allocated* first to existing residences of this Sector *that* are not yet served.

D. WEST SECTOR

1. Encourage and promote reforestation on Maunaloa's Mountains for the purpose of long range water resource enhancement.



33% (MGD) ex 1/3

3 →	1.0	0.267
5	1.665	0.669
8	2.664	0.221

NOTE: Base map, hydrologic units and sustainable yield data adopted from Water Resources Protection Plan, Hawaii Water Plan, June, 1990.

EXHIBIT 1
ISLAND OF MOLOKAI
GROUND WATER RESOURCES

Molokai Water Working Group, 1996

BREAKDOWN OF EXISTING GROUNDWATER USAGE IN MGD

These figures represent information available to but not confirmed nor substantiated by the Group in 1993; current information should be sought from the CWRM.

CENTRAL SECTOR	
Manawainui System	
1. Hawaiian Research	0.56
Kualapuu System	
1. County DWS	0.59
2. DHHL	0.38
3. Kaluakoi Resort	0.82
Subtotal	1.79
NORTHEAST SECTOR	
Kahanui System	
1. National Park Service	0.22
Waikolu System	
1. DOA MIS	1.13
SOUTHEAST SECTOR	
Kamiloloa System	
1. Hawaiian Research	0.26
Kawela System	
1. County DWS	0.32
2. Kawela Plantation	0.16
3. Kamalo Ranch	0.04
Subtotal	0.52
Ualapue System	
1. County DWS	0.18
2. Kamalo Ranch	0.22
3. Place, M. J.	0.22
Subtotal	0.62
WEST SECTOR	0.00
TOTAL	5.10

EXHIBIT 2

Molokai Water Working Group, 1996

BREAKDOWN OF EXISTING SURFACE WATER USAGE IN MGD

These figures represent information available to but not confirmed nor substantiated by the Group in 1993; current information should be sought from the CWRM.

CENTRAL SECTOR	
Kualapuu System	
1. County DWS	0.03
2. Molokai Ranch	0.07
Subtotal	0.10
NORTHEAST SECTOR	
Waikolu System	
1. Molokai Ranch	0.04
2. DOA MIS	2.71
Subtotal	2.75
Halawa System	
1. County DWS	0.002
SOUTHEAST SECTOR	
Kamiloloa System	
1. Molokai Ranch	0.03
Kawela System	
1. Molokai Ranch	0.08
WEST SECTOR	0.00
TOTAL	2.96

EXHIBIT 3

Molokai Water Working Group, 1996

BREAKDOWN OF 2010 POTABLE WATER USE PROJECTIONS IN MGD*

Estimates were furnished by users and were accepted by working group without challenge. These figures are estimates and projections made in 1993, based on information available at that time.

CENTRAL SECTOR	
Manawainui System	
1. Hawaiian Research	0.56
Kualapuu System	
1. County DWS	0.94
2. DHHL	0.84
3. Kaluakoi Resort	2.14
4. Other State Projects	0.11
5. Palaau Industrial Park	0.20
6. Others (Kualapuu, Kalae, Kipu)	0.20
Subtotal	4.43
NORTHEAST SECTOR	
Kahanui System	
1. National Park Service	0.22
Waikolu System	
1. DOA MIS	2.70
SOUTHEAST SECTOR	
Kamiloloa System	
1. Hawaiian Research	0.26
Kawela System	
1. County DWS	0.32
2. Kawela Plantation	0.40
3. Kamalo Ranch	0.04
Subtotal	0.76
Ualapue System	
1. County DWS	0.18
2. Kamalo Ranch	0.22
3. Place, M. J.	0.22
Subtotal	0.62
WEST SECTOR	
Alpha USA	2.0[1]
TOTAL	11.55

**** Decisions by the State of Hawaii or County of Maui relating to planning for, regulation, management, and conservation of water resources shall incorporate and protect adequate reserves of water for the full current and foreseeable development and use of Hawaiian home lands.***

[1] Water development source unidentified.

EXHIBIT 4

Molokai Water Working Group, 1996

NON-POTABLE WATER USE PROJECTIONS IN MGD*

Estimates were furnished by users and were accepted by working group without challenge. These figures are estimates and projections made in 1993, based on information available at that time.

	5 to 10 years	Total	2010 to Build out	Total
DHHL				
Hoolehua	4.00		16.0	
Kalamaula	1.42		7.5	
Subtotal DHHL		5.42[1]		23.5[3]
Other MIS users		2.50[2]		2.5
Molokai Ranch				
Agriculture, Dairy, Pastures:				
1. Ag. Park - Kualapuu	7.70			
2. Coffee - 800 acres	1.50			
3. Dairy - 4,000 head	0.70			
4. Palm Nursery - brackish	0.30			
5. Feedlot	0.20			
6. Pastures	0.20			
7. Hay - assume all irrigated on Homesteads	0.00			
Subtotal Agriculture		10.6[3]		10.6[3]
Recreation:				
1. Maunaloa Links	0.25			
2. Ironwoods	0.20			
3. Network	0.05			
Subtotal Recreation		0.50[3,4]		0.5[3,4]
Kaluakoi Resort				
Recreation: Golf Course Addition (two 36-hole courses)		0.00		2.8[3]
Alpha USA		1.50[3]		3.0[3]
TOTAL		20.52		42.9

**** Decisions by the State of Hawaii or County of Maui relating to planning for, regulation, management, and conservation of water resources shall incorporate and protect adequate reserves of water for the full current and foreseeable development and use of Hawaiian home lands.***

[1]From DHHL projections
From DOA - MIS average delivery = 7.5 mgd
2/3 x 7.5 mgd = 5.0 mgd preference to DHHL
1/3 x 7.5 mgd = 2.5 mgd for other MIS users
Note: deficit from MIS of 0.42 mgd

[2]Assumes maximum usage of 1/3 of MIS for other users

[3]Water development source unidentified

[4]A portion of this projection will be met by the MIS and a portion from private sources

Note: Non-Potable Water Use Projections are for major agricultural and recreational uses in the central and western areas of the island. It does not include instreams uses, fishponds, taro patches, aquacultural projections, etc.

EXHIBIT 5

APPENDIX A

Glossary and Acronyms*

Glossary

1. **Appurtenant Water Right - Generally recognized that Kuleana lands in taro production at the time they were granted by the government (usually during the 1848-1856 Great Mahele) retain "appurtenant rights to the quantity of water necessary to grow taro in the same manner on the same land.

2. **Correlative Water Right - Generally recognized as that all landowners overlying a ground water basin have a right to share in the use of the underground waters.

3. Demonstrable - Capable of being demonstrated, to prove, to exhibit.

4. Developable Yield - Calculated by subtracting out water resources not directly available from the sustainable yield due to the possible interaction between ground water and streams.

5. Non-Potable Water - Not suitable for drinking.

6. Potable Water - Suitable for drinking.

7. Reasonable-Beneficial Use - The use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest.

8. Sustainable Yield - The maximum rate at which water may be withdrawn from a water source without impairing the utility or quality of the water source as determined by the Commission.

Acronyms

1. DOA - State Department of Agriculture

2. DHHL - State Department of Hawaiian Home Lands

3. DOH - State Department of Health

4. DWS - Maui County Department of Water Supply

5. MGD - Million Gallons per Day

6. MIS - Molokai Irrigation System

7. NPS - National Park Service

* **The glossary and acronyms have been provided by the facilitators and staff at the request of the Molokai Working Group and does not in any way reflect a concensus decision of the group.**

** **These definitions are general in nature and are not to be assumed to be a full legal definition of the terms.**

APPENDIX B

Working Group "Contract"
(Ground rules of the group were adopted by consensus)

1. Facilitators role is to assist group through the process and enable consensus decision-making. Facilitators will stay neutral and any member of the group can stop the process to remind the facilitators of this.

2. It's OK to disagree -
Members will make their best efforts to stay patient.

3. Be tough on issues wherever possible -
Members will be easy on each other.

4. Common courtesies -
Members agree not to interrupt, walkout or hog the floor.

5. The group will operate by consensus -
See Attachment A

6. Members agree not to have meetings electronically recorded -
Facilitators will record on flip chart paper supplemented with notes.

7. Members agree that there will be alternates when members are not able to attend meetings.

8. Release of group proceedings -
No one person speaks for the group. Group speaks as one, after reaching consensus.

9. Meetings will be open to the community -
But non-working group members can speak only by invitation of the group.

10. The community can submit ideas or information in writing to the members.

11. In the spirit of reaching consensus, it is expected that members will not simply say "NO" to an idea without affirming an alternative.

APPENDIX C

Attachment A

Levels of Consensus

4. "Yes"	I fully support and endorse . . . . .
3. "Yes . . . . . But . . ."	I can live with it, even though it doesn't meet all my needs.
2. "Yes, with Reluctance"	I don't like it and must register my feelings but, I'll defer to the wisdom of the group.
1. "No"	I must stand in the way of this.
0. "Abstain"	I abstain because of . . . . .

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Appendix T

Wastewater Treatment Design

WASTEWATER TREATMENT DESIGN AND OPERATING ASPECTS

Treatment Requirements for R-1 Recycled Water

The primary method of effluent disposal proposed for the La'au Wastewater Treatment Plant (WWTP) is beneficial reuse as irrigation water for select areas of conservation lands along the coastline and for soil erosion control in arid areas of this project. Therefore, the effluent produced by the WWTP shall meet the Hawaii State Department of Health (DOH) R-1 recycled water quality criteria. R-1 quality recycled water requires the effluent to be at all times oxidized, then filtered, and then exposed to a disinfection process that kills pathogens.

Overview of Proposed Treatment Facilities

A fully integrated wastewater treatment system that incorporates biological processes, ultrafiltration membranes, and disinfection technology is proposed for the WWTP due to the stringent effluent requirements for R-1 recycled water. This technology combines the activated sludge process with micro-pore filtration in a compact membrane bioreactor (MBR). Both oxidation and filtration are achieved in the MBR, thus eliminating the need for separate secondary and tertiary treatment processes.

Preliminary treatment of the plant influent for treatment in the MBR include coarse bar screening, grit removal, flow equalization, anoxic basin, pre-aeration, and fine screening of the wastewater.

Final effluent from the MBR, virtually particulate-free, will be disinfected using ultraviolet irradiation to render it bacteriologically safe for recycle and disposal.

Solids generated at the WWTP include screenings, grit and sludge. Screenings and grit will be dried on-site using sand drying beds and disposed in a county landfill.

A schematic of the treatment proposed at the WWTP and a conceptual site layout are provided in Figures 1 and 2, respectively. Constituent concentration levels anticipated after each treatment process are presented in Table 1.

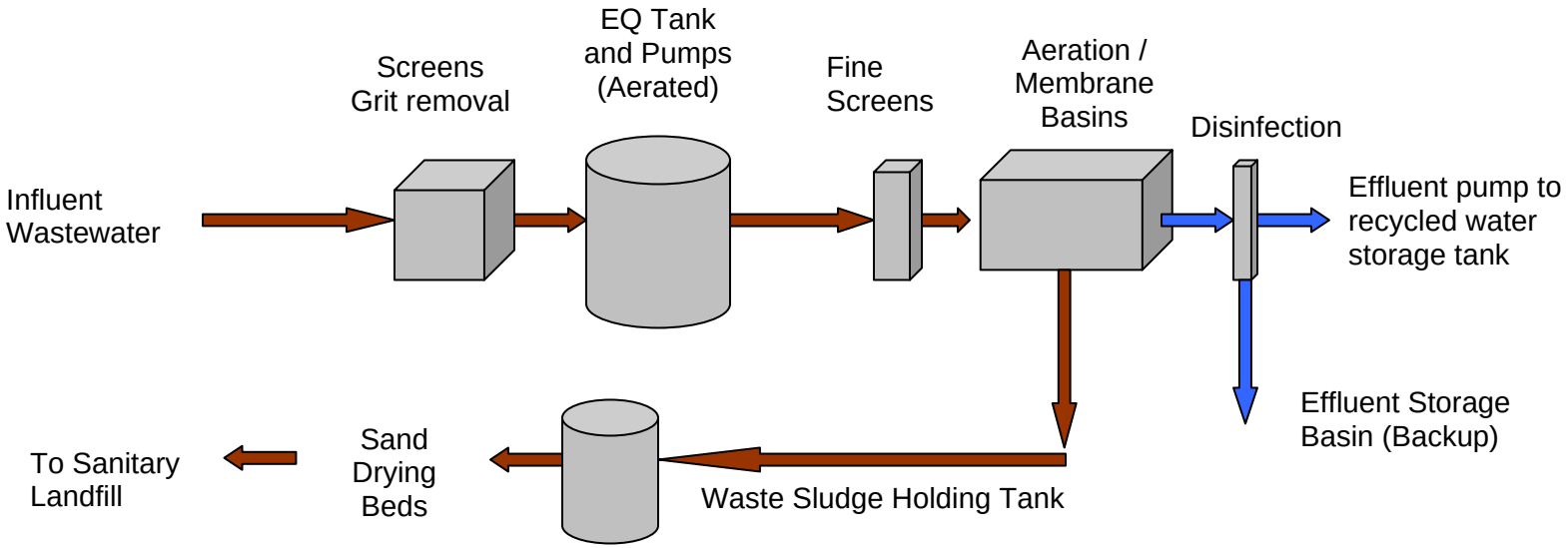
TABLE 1
ANTICIPATED EFFLUENT CONSTITUENT LEVELS

Constituent	Influent	MBR	UV Disinfection
Average BOD_5 (mg/L)	240	< 5	< 5
Average SS (mg/L)	240	< 5	< 5
Fecal Coliform – median (CFU/100 mL)	10^8	< 23	< 1
Turbidity (NTU)	30 - 50	< 0.2	< 0.2

FIGURE 1

PROCESS FLOW DIAGRAM

Figure 1
Flow Diagram – Submerged Membrane Bioreactor Wastewater Treatment Plant



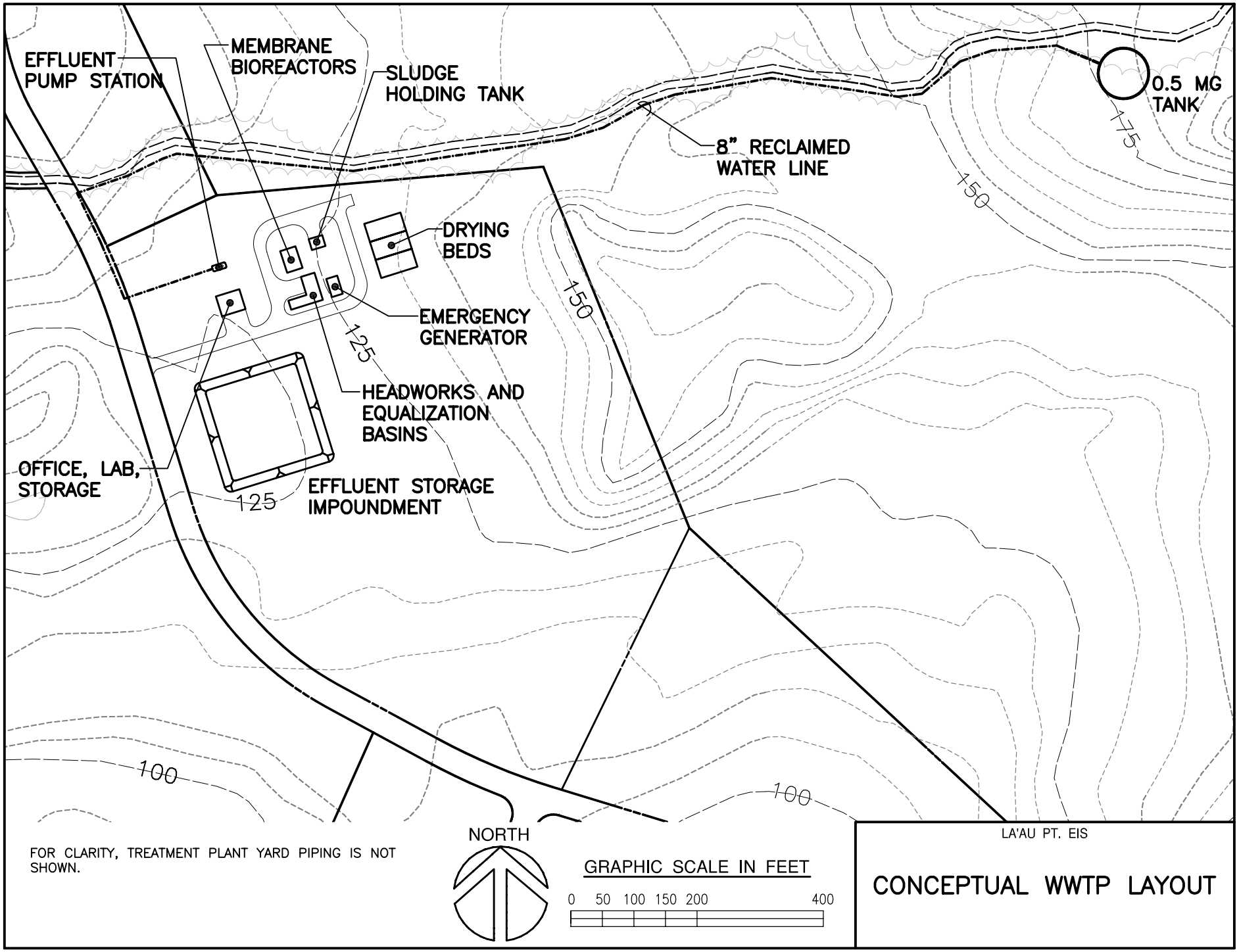
Recirculation path and equipment are not shown

1. Preliminary treatment using coarse screens
2. Grit Removal
3. Equalization Tank- Size dependent on system peak flow
4. Fine Screen – 1/8” opening
5. Anoxic / Aeration / Membrane Tanks (MBR) and Permeate Pumps and Air Blowers
6. Disinfection by ultraviolet irradiation
7. Effluent storage basins (when not irrigating using recycled water)
8. Waste sludge holding tank for biosolids dewatering on sand drying beds

FIGURE 2

CONCEPTUAL WWTP LAYOUT

Sep 26, 2006–4:03pm
N:\CAD\DWG\2006\0629 LA'AU PT. WWTP EIS\FIGURES\LA'AU BASE.dwg



FOR CLARITY, TREATMENT PLANT YARD PIPING IS NOT SHOWN.

LA'AU PT. EIS

CONCEPTUAL WWTP LAYOUT

Sludge Treatment and Disposal

The MBR is essentially a high mixed liquor suspended solids (MLSS) activated sludge process utilizing a membrane as a means to separate the solids from the liquid. The MLSS concentration in the MBR typically ranges between 15,000 mg/L to 30,000 mg/L with sludge ages typically in excess of 40 days. Therefore, sludge digestion is typically not required following the MBR. Wasted sludge (or biosolids) from the MBR will be dewatered to humus using sand drying beds, a practice that is particularly conducive in the arid climate of west Molokai. Biosolids residue for disposal at a county landfill will be small, amounting to about 70 cubic yards annually.

Alarms and Telemetering

Alarms indicating high and low liquid level conditions, equipment malfunction, and other emergency conditions will be a feature of the WWTP. Visual and audio alarms will be integrated in the control centers of the WWTP, and any alarm signals will be sent through telephone lines to the homes and mobile telecommunication devices of key maintenance personnel as an additional safety measure during non-work hours.

Odor Control

Since the collection system for the development is not extensive and the sewer flow velocities are high in the small-diameter pressure mains, the detention time in the sewer system should be relatively short, thereby minimizing the formation and emission of odors at the WWTP.

Reliability and Redundancy

Safeguards will be incorporated in the plant design to ensure that treatment operations are uninterrupted in the event of power failure or equipment malfunction. Design features will comply with the reliability and redundancy provisions promulgated in the *"Guidelines for the Treatment and Use of Recycled Water"*, prepared by the Hawaii State Department of Health, and dated May 15, 2002, and amendments thereto. For power supply reliability, an auxiliary generator will automatically operate and transfer power during electrical power outages. For process redundancy, multiple units of tanks, pumps, and other key equipment will afford parallel operation during times when a process unit is taken out of service for maintenance or repair.

During times when the irrigation system is not in operation or when recycled water quantities exceed the irrigation requirements, a storage tank and backup storage and disposal impoundment will be utilized for any exces, such as in times of inclement weather or system maintenance.

Restricted Public Access

Wastewater conveyance pump stations and treatment facilities will be fenced to restrict public access.

Warning Signs and Special Precautions

Effluent reuse facilities, including piping and appurtenances, and application areas subject to public access will have warning signs stating that irrigation water is not fit for consumption. These signs shall comply with the DOH guidelines.

Construction Phasing

The treatment plant will be constructed with an initial capacity of 60,000 gallons per day (gpd), and consist of dual parallel process trains of 30,000 gpd to afford operating redundancy. At some future time when the wastewater flow is forecast to increase as build-out of the project nears, another increment of up to two 30,000 gpd capacity modules will be added to the existing plant. Concomitant with this expansion will be provisions for additional drying beds and ancillary equipment.