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and its supporters

COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

In re Petitions to Amend Interim  
Instream Flow Standards for  
Honopou, Huelo (Puolua), Hanehoi,  
Waikamoi, Alo, Wahinepe'e,  
Puohokamoa, Haipua'ena,  
Punalau/Kōlea, Honomanu, Nu'ailua,  
Pi'ina'au, Palauhulu, Ohia (Waianu),  
Waiokamilo, Kualani, Wailuanui, West  
Wailuaiki, East Wailuaiki, Kopili'ula,  
Puaka`a, Waiohue, Pa`akea, Waiaka`a,  
Kapa`ula, Hanawī and Makapipi  
streams.

Case No. CCH-MA13-01

EXHIBITS OF MAUI TOMORROW  
FOUNDATION, INC. AND ITS  
SUPPORTERS;  
CERTIFICATE OF SERVICE

mt/exhibits

**EXHIBITS OF MAUI TOMORROW  
FOUNDATION, INC. AND ITS SUPPORTERS**

# CARETAKER AGREEMENT

I, George Kala as the legal prop located at Hamakualoa, Maui, TM the right to access and use of the ab Shupp, whose mailing address is P.

of one acre of agricultural land -008-014-0000, agree and assign ribed property, to Ernest J. Shupp, 602, Haiku, Maui 96718.

Serving in the capacity of resident caretaker in my absence, Mr. Shupp agrees to maintain the property appropriately, continue developing its farming potential, and to provide protection and security from trespassing, vandalism, and any other unlawful acts, by contacting the proper authorities. I authorize Mr. Shupp to act in my behalf on the above conditions.

I reserve the right to amend and/or terminate this agreement at anytime, by written notification.

Mr. Shupp and I have entered into this agreement on this day, the 4th of September 1998.

George Kala  
George Kala, Property Owner  
2005 Anole  
Honolulu, Hawaii 96819  
Ph. (808) 95-6140

Mary Kala  
Mary Kala, Witness

Ernest J. Shupp  
Ernest J. Shupp, Caretaker  
Ph. (808) 572-452

Elizabeth Lapeña  
Elizabeth Lapeña, Witness





NOTICE: Owner's, lessee's and vendee's names recorded on this tax map print may not be current.

*Dropped Parcels. 27, 29, 30, 32  
2, 3, 5, 8, 19, 22, 23, 25*

SECOND		DIVISION	
ZONE	SEC.	PLAT	
2	9	08	
CONTAINING		PARCELS	
SCALE: 1 in = 100 ft.			

*SINCE SELLER  
WAS TO CHANGE*

PRINTED SEP 16 1997



Claimant & Helu	Ahupua'a	Testimony Book & Page	Summary of Claim Documentation	Hale	Lo'i Kalo	Auwai	Kihapai Kula Mahiai Mala Moo Opu Pa	Crops, Activities and Resources Identified	Disposition N/A=Not Awarded Mahele Award Book & Royal Patent
Kamakaeu <b>Helu 6510 O</b> (see also <b>Helu 7768</b> )	Haiku & Panwela	7:16 & FT 8:135	Haleole sworn: I have seen his land. It was I who wrote out his claim. Par. 1. <i>Kalo</i> land at Maunaou in Haiku <i>Ahupuaa</i> . Par. 2. <i>Kula</i> land at Waiaama in Haiku <i>Ahupuaa</i> . Par. 3. <i>Kula</i> land at Hoopauwahie in Pauwela <i>Ahupuaa</i> .	—	—	—	3	<i>Kalo</i> <i>Kula</i>	MA 5:521 RP 5259 Book 21:173
Kanui <b>Helu 6510 P</b> (& 3717 B)	Puolua & Hanehoi	7:16-17 & FT 8:135	It is true that Kaiewe wrote his claim. Kamaka sworn: I have seen his land, 2 parcels. Par. 1. A <i>kalo kula</i> at Keopi in Puolua <i>Ahupuaa</i> . Par. 2. A <i>kalo kula</i> at Opuololo in Hanehoi <i>Ahupuaa</i> (the Waikuku boundary is the <i>Kahawai</i> of Huelo). Kaiewe gave these parcels to him in 1844. There are 2 <i>Poalima</i> in Parcel 1.	—	—	—	2	<i>Kalo</i> <i>Kula</i> <i>Poalima</i> (2) <i>Kahawai</i>	MA 3:450 RP 4951 Book 20:125
Kawaha <b>Helu 6510 Q</b>	Honopou & Waipio	7:17 & FT 8:136	It was I who wrote the claim. Iseraela sworn: I have seen his land, 3 parcels. Par. 1. A <i>kalo kula</i> at Lanikabuli, Honopou <i>Ahupuaa</i> . Par. 2. A <i>kalo kula</i> at Waiohiwi, Honopou <i>Ahupuaa</i> . Par. 3. A <i>kalo kula</i> at Kalualaea, Waipio <i>Ahupuaa</i> .	—	—	—	3	<i>Kalo</i> <i>Kula</i>	MA 5:502 RP 3774 Book 16:307

Claimant & Hele	Ahupua'a	Testimony Book & Page	Summary of Claim Documentation	Hale	Lo'i Kalo	Auwai	Kihapai Kala Mahiia Mahina Maa Moo Opu Pa	Crops, Activities and Resources Identified	Disposition N/A=Not Awarded Mahele Award Book & Royal Patent
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Ii, Daniel <i>Hele</i> 520	Huelo (& Lahaina)	FT 15:74	<p>Ua sworn, and being shown the survey made by Mr. Alexander, says he knows the piece of land represented and that it belongs to claimant. It was given to Ii by Hoapili Kane in the year 1835 as an absolute gift. Claimant has held uninterrupted possession of the place up to this time; has a house on it and always cultivated it.</p> <p>(Copy) Resolved, that in view of the statement of His Majesty, that it was his intention originally to have the Division of lands made to secure to Daniela Ii of Maui, "Huelo" in Hanakualoa, and "Nakalepo" in Lahaina, and to the Government, "Kalulu" on Lanai, but that the matter was forgotten at the time, the Minister of the Interior is authorized to correct the decision on record accordingly. By order of Privy Council, January 31<sup>st</sup> 1853...</p> <p>Kaunamauna Sworn. Knows the place claimed by Daniela Ii. It was given him by Hoapili Kane in the year 1835. He has cultivated and held uninterrupted possession of the place up to this time...</p>	—	—	—	—	Land cultivated since 1835	MA 9:319 RP 6847 Book 22:423
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Claimant & Helu	Ahupua'a	Register Book & Page	Summary of Claim Documentation	Hale	Lo'i Kalo	Auwai	Kihapai Kula Mahiai Mahina Moo Opu Pa	Crops, Activities and Resources Identified	Disposition N/A=Not Awarded Mahale Award Book & Royal Patent
Kalimo <i>Helu 5453 C</i>	Haiku	6:295	January 20, 1848 My <i>kuleana</i> is 15 <i>kihapai uala</i> , a <i>kihapai mahi wauke</i> , and my <i>kauhale</i> (house) at Maikiko, in Haiku.	1	—	—	16	<i>Uala Wauke Kauhale</i>	See Testimony
Moi <i>Helu 5459</i>	Hanehoi & Waipio	6:297	My <i>kuleana</i> is the <i>ili</i> of <i>Ohia</i> at Hanehoi, Hamakualoa, and also many places with <i>loi</i> at Waipio.	—	3+	—	—	<i>Loi (Kalo)</i>	See Testimony
Kaleo <i>Helu 792</i>	Hanehoi	6:297	My <i>kuleana</i> is at Mohala, in Hanehoi, Hamakualoa. Gotren from the <i>konohiki</i> .	—	—	—	—	—	N/A
Papaiakea <i>Helu 5459 B</i>	Puolua	6:298	My <i>kuleana</i> is at Kuakawakawa in Puolua. There are many <i>loi</i> at various locations.	—	3+	—	—	<i>Loi (Kalo)</i>	See Testimony
Paukei <i>Helu 5459 C</i>	Huelo	6:298	My <i>kuleana</i> is at Pohakoelē in Huelo. There are many <i>loi</i> at various places which are mine.	—	3+	—	—	<i>Loi (Kalo)</i>	See Testimony
Kaalae <i>Helu 5459 D</i>	Papaanea	6:298	My <i>kuleana</i> is the <i>ili</i> of <i>Waiakawiiwi</i> , in Papaanea. I have cultivated various locations.	—	—	—	—	<i>Mahi ma kahi e</i>	See Testimony
Kuluwaimakalani <i>Helu 5459 E</i>	Huelo	6:298	My <i>kuleana</i> is at Kamakauke in Huelo. There are many <i>loi</i> at various locations.	—	3+	—	—	<i>Loi (Kalo)</i>	See Testimony
Kaahaiea <i>Helu 5459 F</i>	Huelo	6:298	My claim is at Palau in Huelo. There are many <i>loi</i> in various places.	—	3+	—	—	<i>Loi (Kalo)</i>	See Testimony
Mahoe <i>Helu 5459 G</i>	Huelo	6:298	My <i>kuleana</i> is at Kahaloa in Huelo.	—	—	—	—	—	See Testimony
Kaaneae <i>Helu 5459 H</i>	Hanehoi	6:298	My <i>kuleana</i> is at Opuooloo in Hanehoi.	—	—	—	—	—	See Testimony
Poohina <i>Helu 5459 I</i>	Honokala	6:298	My <i>kuleana</i> is at Ha in Honokala.	—	—	—	—	—	See Testimony
Kanamu <i>Helu 5459 K</i>	Waipio	6:299	My <i>kuleana</i> is at Pohakulua in Waipio.	—	—	—	—	—	See Testimony



Claimant & Helu	Ahupua'a	Testimony Book & Page	Summary of Claim Documentation	Hale	Lo'i Kalo	Auwai	Kahapai Kula Mahiai Māla Mao Opu Pa	Crops, Activities and Resources Identified	Disposition N/A=Not Awarded Māhele Award Book & Royal Patent
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Kawahine <i>Helu 5392 B</i>	Hanehoi	5:490 & 8:113	Kolea sworn: I have seen his 3 parcels of land. Parcel 1, <i>kalo</i> land at Kaiwa; Parcel 2, <i>kalo</i> land at Naukele; Parcel 3, <i>kalo</i> land at Olona. These are all <i>iti</i> in the Ahupuaa of Hanehoi. There is a <i>Poalima</i> in Parcel 1, and two <i>Poalima</i> in Parcel 2.	—	—	—	3	<i>Kalo Poalima</i> (3)	MA 7:51 & MA 8:309 RP 2782 Book 13:23
Kanakaokai <i>Helu 5392 G</i>	Huelo Puolua Hanehoi & Honokala	5:490- 491 & 8:113- 114	Moi sworn: I have seen his 5 parcels of land. Parcel 1 is <i>kalo</i> land in the <i>iti</i> of Pulehu, at Huelo; Parcel 2 is <i>kalo</i> land in the <i>iti</i> of Keopi, at Puolua; Parcel 3 is <i>kila</i> land at Luaohia; Parcel 4 is <i>Olona</i> at Hanehoi; Parcel 5 is <i>Olona</i> at Honokala... No. 3, is bounded: <i>Manuka</i> , Mua's land; Koolau, <i>Pahi</i> of Hanehoi; on the other two sides, the <i>Kahawai</i> of Huelo...	—	—	—	5	<i>Kalo Olona Kahawai</i>	MA 8:308 RP6969 Book 26:379
Nika <i>Helu 5392 H</i>	Waipio	5:491 & FT 8:114	Kawaha sworn: I have seen his 4 parcels of land. Parcel 1, <i>kalo</i> land in the <i>iti</i> of Pahoa; Parcel 2, <i>kalo</i> land at Kalunahana; Parcel 3, <i>kalo</i> land at Pohokiki; Parcel 4, <i>kalo</i> land at Wailoa. These are all <i>iti</i> in the Ahupuaa of Waipio. Kaulapa gave all of these parcels to him in 1828. There is one <i>Poalima</i> in each parcel.	—	—	—	4	<i>Kalo Poalima</i> (4)	MA 7:47 RP 3328 Book 14:449

<i>Claimant &amp; Helu</i>	<i>Ahupua'a</i>	<i>Register Book &amp; Page</i>	<i>Summary of Claim Documentation</i>	<i>Hale</i>	<i>Lo'i Kalo</i>	<i>Auwai</i>	<i>Kihapai Kula Mahiai Mahina Mala Moo Opu Pa</i>	<i>Crops, Activities and Resources Identified</i>	<i>Disposition N/A=Not Awarded Mahele Award Book &amp; Royal Patent</i>
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<i>Kahi Helu 5459 L</i>	Puolua	6:299	My <i>kuleana</i> is at Puulahokole in Puolua.	—	—	—	—	—	N/A
<i>Paleku Helu 5459 M</i>	Hanehoi	6:299	My <i>kuleana</i> is at Kaiwa in Hanehoi.	—	—	—	—	—	N/A
<i>Olomele Helu 5459 N</i>	Hanehoi	6:299	My <i>kuleana</i> is at Pohakoele in Hanehoi.	—	—	—	—	—	See Testimony
<i>Hewahewa Helu 5459 O</i>	Honopou	6:299	My <i>kuleana</i> is at Pupuana in Honopou.	—	—	—	—	—	See Testimony
<i>Puuhana Helu 5459 P</i>	Honopou	6:299	My <i>kuleana</i> is at Pohaku in Honopou.	—	—	—	—	—	N/A
<i>Kaluhiahee Helu 5459 Q</i>	Huelo	6:299	My <i>kuleana</i> is at Kawahaokapuaa in Huelo.	—	—	—	—	—	See Testimony
<i>Pahia Helu 5459 R</i>	Huelo	6:299	My <i>kuleana</i> is at Pulehu in Hamakua.	—	—	—	—	—	See Testimony
<i>Naoo Helu 5459 S</i>	Huelo	6:299	My <i>kuleana</i> is at Kalalii in Huelo.	—	—	—	—	—	See Testimony
<i>Lalahii Helu 5459 T</i>	Puolua	6:299	My <i>kuleana</i> is at Kawapapuaa in Hamakua.	—	—	—	—	—	See Testimony
<i>Kepio Helu 5459 U</i>	Waipio	6:300	My <i>kuleana</i> is at Makaku in Waipio.	—	—	—	—	—	See Testimony
<i>Kaliki Helu 5459 (V) (&amp; 5516 F)</i>	Honopou	6:300	My <i>kuleana</i> is at Kunoohua in Honopou.	—	—	—	—	—	See Testimony
<i>Paaluhii Helu 5459 W</i>	Halehaku	6:300	My <i>kuleana</i> is at Pohakulua in Halehaku.	—	—	—	—	—	See Testimony
<i>Imahia Helu 5459 X</i>	Honopou	6:300	My <i>kuleana</i> is at Puniawa, Kaulukannu in Honopou.	—	—	—	—	—	See Testimony
<i>Keahi Helu 5459 Y</i>	Puolua	6:300	My <i>kuleana</i> is a wai <i>Olona</i> (a wet area of <i>Olona</i> growth) in Holawa.	—	—	—	1	<i>Olona</i>	See Testimony

*Table 3. (continued) District Hāmākuā Loa, Maui*

<i>Grant No.</i>	<i>Grantee</i>	<i>Location</i>	<i>Acreage</i>	<i>Book</i>	<i>Year</i>
183	Alexander, W. P.	Haiku	180 A	3	1849
121	Armstrong, R.	Haiku	530 A	1	1849
166	Armstrong, R.	Haiku	558 A	1	1849
176	Armstrong, R.	Haiku	852 A	3	1849
2887	Gower, M. M.	Haiku	2.79 A	14	1862
182	Kekuanaoa for Kamamalu	Haiku	3226 A	3	1849
165	Kekuanaoa for Kamamalu	Haiku	567 A	1	1849
59	Miner, E.	Haiku	674.2 A	1	1847
2701 & 1442	Copp, H. & Crowningburg; Hardy, B. F.	Pauwela	272 A	13 5	1860 1854
3080	Haiku Sugar Co.	Pauwela	62 A	14	1871
184	Hough, James (Cancelled)	Pauwela	272 A	3	1849
594	Ii, Daniel	Pauwela	24.6 A	2	1851
141	Kaniau, M.	Pauwela	70 A	1	1849
140	Kuhio	Pauwela	14.23 A	1	1849
220	Lee, W. L.	Pauwela	612 A	3	1850
226	Lee, W. L.	Pauwela	210 A	1	1850
137	Nahinu	Pauwela	62.8 A	1	1849
144	Paele	Pauwela	46.25 A	1	1849
383	Armstrong, R.	Kuiaha, E	360 A	3	1850
139	Kaea	Kuiaha, E	16.65 A	1	1849
138	Kapihe	Kuiaha, E	39.08 A	1	1849
217	Lee, W. L.	Kuiaha, E	612 A	3	1850
771	Hikiau	Kaupakulua, E	1836 A	3	1852
2974	Allen, E. H.	Kaalaea	78 A	14	1864
3221	Naala (w)	Keaaula	119.5 A	15	1879
160	Bishop, C. R.	Uaoa, 1 & 2	598.3 A	3	1849
2182	Anthon, L. H.	Kealiinui	229 A	12	1856
149	Swinton, H. S.	Peahi	522 A	3	1849
221	Swinton, H. S.	Peahi	Ahupuaa	1	1850
3087	Kamoku	Halehaku	15.84 A	14	1871
972	Fern, James	Honopou	109.25 A	5	1852
1903	Hiilawe	Honopou	1 Loi	10	1855
1916	Imihio	Honopou	5 A	10	1855
2471	Keohokano	Honopou	33.62 A	13	1858
1169	Kaaiwa	Honopou	11.29 A	6	1853
1082	Kaimi	Honopou	8 A	6	1853
1918	Kaimi	Honopou	2 Loi	10	1855
1264	Kahalelaau	Honopou	10.77 A	6	1853
1266	Kaoo	Honopou	8 A	6	1853
3101	Kepani	Honopou	15.82 A	14	1872
538	Koahou	Honopou	117.25 A	3	1851
1267	Nakaikuaana	Honopou	11.75 A	6	1853

Table 3. (continued) District of Hāmākua Loa, Maui

Grant No.	Grantee	Location	Acreage	Book	Year
1077	Nui	Honopou	9.37 A	6	1852
1265	Paaluhi	Honopou	10.80 A	6	1853
1081	Piohia	Honopou	9.62 A	6	1852
1263	Puukoa	Honopou	8.70 A	6	1853
3110	Poiuhane	Honopou	3.37 A	14	1873
1075	Wills, T. A. S.	Honopou	89 A	6	1852
3202	Haleole	Hoolawa	114.8 A	15	1879
1260	Kapahu	Hoolawa	13.22 A	6	1853
1084	Kaupena	Hoolawa	15.12 A	6	1852
1255	Kipawale	Hoolawa	9.40 A	6	1853
1259	Kolea	Hoolawa	4 A	6	1853
2131	Kolea	Hoolawa	29 A	11	1856
1254	Mehe	Hoolawa	6.33 A	6	1853
2125	Naoopu	Hoolawa	13.86 A	12	1856
1083	Nawelu	Hoolawa	14.87 A	6	1852
2041	Reed, J. & Norton, G. B.	Hoolawa	138 A	11	1856
3263	Namale	Hoolawa	48.9 A	16	1880
1076	Wahahee	Hoolawa	13.37 A	6	1852
1143	Kauwaha	Honokala	5 A	6	1853
1142	Keoho & Makue	Honokala	126 A	6	1853
1152	Norton, G. B. & Reed, J.	Honokala & Hoolawa	290 A	6	1853
1262	Kahiwalu	Puolua	86.20 A	6	1853
1900 or 1921	Kawaha	Puolua	2.78 A	10	1855
2630	Keahi	Puolua	2 Loi	13	1859
1686	Okuu	Puolua	1 A	9	1855
1261	Papaiakea	Puolua	0.14 A	6	1853
3214	Papaiakea	Puolua	170 A	15	1879
1901	Paukei	Puolua	0.67 A	10	1855
1087	Hanakahi	Hanehoi	13.37 A	6	1852
1086	Kaekaeka	Hanehoi	9.62 A	6	1852
1256	Kaiewe	Hanehoi	0.39 A	6	1853
2784	Kaiewe	Hanehoi	11.9 A	14	1861
2079	Kaiewe	Hanehoi	94.89 A	11	1856
1085	Kamoekolohe	Hanehoi	6.12 A	6	1852
2854	Kanakaokai	Hanehoi	21.3 A	14	1862
2479	Olomele	Hanehoi	0.75 A	13	1858
1080	Puha	Hanehoi	15.12 A	6	1852
1079	Puowaina	Hanehoi	15.25 A	6	1852
1078	Wanaoa	Hanehoi	2.87 A	6	1852
2081	Nakoa & Uilama	Hoalua & Hanawana	48 A	11	1856
1457	Hanauwaha	Hanawana	36.5 A	8	1854
1257	Kekahuna	Hanawana	100.45 A	6	1853

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Naone <i>Helu 4284 D</i>	Pauwela	7:37	Pilipili sworn: It is true that his claim was written. Paele sworn: I have seen his land. Parcel 1 is <i>kalo</i> land at Mookiki; Parcel 2 is <i>kalo</i> land at Waiokana. These are <i>ili</i> of Pauwela <i>Ahupuaa</i> . There are 3 <i>Poalima</i> . Parcel 1 was given to him by Kekumoku in 1841. Parcel 2 was given to him by Kila in 1830.	—	—	—	2	<i>Kalo Poalima</i> (3)	MA 9:466 RP 2776 Book 13:11
Kahalela (Kahalelaau) <i>Helu 3504</i> (see also <i>Helu 5504</i> & 3304 E)	Haiku & Halimaile	FT 8:79	The Clt's lands are of two pieces in Haiku [ & Halimaile ]. No. 1. is a <i>kula</i> land in Kukuioleu [Halimaile]. No. 2. is a <i>kula</i> land in Hano. The Claimant rec'd. it from Kamakakai in 1831. His title been disputed by Kekauonohi. She has sold this place to Judge Parson's.	—	—	—	2	<i>Kula</i> (Disputed)	N/A
Naaeae (Kaaeae) <i>Helu 5459</i> ( <i>Helu 5459 H</i> )	Hanehoi	FT 8:104	Kanakaokai Sw.: The Clt's lands are four pieces of <i>kalo</i> and <i>kula</i> land in the <i>ili</i> of Opuololo, Hanehoi <i>Ahupuaa</i> . The Clt. rec'd. this land from Kaiawe in the year 1844. His title has never been disputed. It is bounded: <i>Mauka</i> , Kaiawe's land; <i>Koolau</i> , my land; <i>Makai</i> , Kanui's land; <i>Wailuku</i> , Creek of Huelo. (As translated in Native Testimony.)	—	—	—	4	<i>Kula Kalo Kahawai</i>	MA 3:446 RP 2218 Book 9:333

Claimant & Helu	Ahupua'a	Testimony Book & Page	Summary of Claim Documentation	Hale	Lo'i Kalo	Auwai	Kihapai Kula Mahiai Mahina Mala Moo Opu Pa	Crops, Activities and Resources Identified	Disposition N/A=Not Awarded Mahele Award Book & Royal Patent
Paaluhi <b>Helu 5459 W</b>	Halehaku	5:488-489 & FT 8:111-112	Kahoakaku sworn: I have seen his 2 parcels of land. Parcel 1 is a <i>kalo</i> land at Pohakuloa; Parcel 2 is a <i>kalo</i> land at Papalua. These are <i>ili</i> of Halehaku, gotten in the time of Kamehameha I. There is one <i>Poalima</i> each, in Parcels 1 and 2.	—	—	—	2	<i>Kalo Poalima</i> (2)	MA 8:402 RP 7068 Book 26:547
Imihia <b>Helu 5459 X</b>	Honopou	5:489 & FT 8:104	Nakaikuaana sworn: I have seen his 4 parcels of land. Parcel 1, a <i>kalo</i> and <i>uala</i> land at Puniawa; Parcel 2, a <i>kalo</i> and <i>uala</i> land at Kaulukanu; Parcel 3, a <i>kalo</i> and <i>uala</i> land at Papamuku; Parcel 4, a <i>kalo</i> and <i>uala</i> land at Halaula (bounded on the <i>Makai</i> side by the <i>Kahawai</i> of Honopou). These are all <i>ili</i> of Honopou... Parcels 3 & 4 were from the time of Kamehameha I in 1819... There are 2 <i>Poalima</i> in No. 1; one <i>Poalima</i> each in No. 1 and 2... ...No. 4, is bounded: <i>Mauka</i> , my land; Koolau, <i>Pali</i> of Honopou; <i>Makai</i> , <i>Kahawai</i> of Honopou; <i>Wailuku</i> , <i>Pali</i> of Honopou.	—	—	—	4	<i>Kalo Uala Poalima</i> (4) <i>Kahawai</i>	MA 8:299 RP 3241 Book 14:275
Kawahine (Makapowahine) <b>Helu 5392 B</b>	Puolua & Waipio	5:489-490 & FT 8:112-113	Kolea sworn: I have seen his 2 parcels of land. Parcel 1 is a <i>kalo</i> land in the <i>ili</i> of Popolonui, at Puolua; Parcel 2 is a <i>kalo</i> land in the <i>ili</i> of Kahiwa, on the <i>kula</i> at Waipio.	—	—	—	2	<i>Kalo Kula</i>	MA 7:51 & MA 8:309 RP 2782 Book 13:23
Kamoenalauhulu <b>Helu 5392 (E)</b>	Waipio	5:490 & FT 8:113	Nika sworn: I have seen his parcel of <i>kalo</i> land in the <i>ili</i> of Alele, at Waipio. There is one <i>Poalima</i> .	—	—	—	1	<i>Kalo Poalima</i> (1)	N/A

Claimant & Helu	Ahupua'a	Testimony Book & Page	Summary of Claim Documentation	Hale	Lo'i Kalo	Auwai	Kihapai Kula Mathia Malihina Mala Moo Opu Pa	Crops, Activities and Resources Identified	Disposition N/A=Not Awarded Mahele Award Book & Royal Patent
Keahi <b>Helu 5459 Y</b>	Puolua	5:481 & FT 8:104	Kaliwale sworn: I have seen his parcel of land at Puulahakole, in the Ahupuaa of Puolua. It is a <i>kalo</i> and <i>kula</i> land, gotten from Kaiewe in 1844... The boundary on the Wailuku side is the <i>Kahawai</i> of Puolua.	—	—	—	1	<i>Kalo</i> <i>Kula</i> <i>Kahawai</i>	MA 3:449 RP 7054 Book 26:523
Kanahi <b>Helu 5423</b>	Peahi	5:481 & FT 8:104 -105	Poohina sworn: I have seen his 2 parcels of land. Parcel 1 is at Hakioho; Parcel 2, a <i>kahuahale</i> (house) in the <i>iti</i> of Pohakuhaku, Ahupuaa of Peahi. There is 1 <i>Poalima</i> in his land.	1	—	—	2	<i>Kahuahale</i> <i>Poalima</i> (1)	MA 8:323 RP 4067 Book 17:131
Palea <b>Helu 5451</b>	Honopou	5:481-482 & FT 8:105	Kaawa sworn: I have seen his 4 parcels of land. Parcel 1 is at Uluku; Parcel 2 is at Kahauiki; Parcel 3 is at Kaluakanaka; Parcel 4 is at Oaku, all of these parcels are in the Ahupuaa of Honopou. They are old lands, from the time of Kamehameha I. There is a <i>Poalima</i> in Parcel 2. Parcel 1. <i>Kalo</i> land; <i>Kahawai</i> of Honopou bounds it on the Wailuku side. Parcel 2. <i>Kalo</i> land. Parcel 3. <i>Kalo</i> land; an <i>Alanui pii a iho</i> ( <i>mauka-makai</i> trail) bounds it on the Koolau side. Parcel 4. <i>Kula</i> land; <i>Kahawai</i> of Honopou bounds it on the Koolau side.	—	—	—	4	<i>Kalo</i> <i>Kula</i> <i>Poalima</i> (1) <i>Kahawai</i> <i>Ala pii a iho</i>	N/A

G. W. Robertson  
J. H. Smith  
A. Kekaulahao

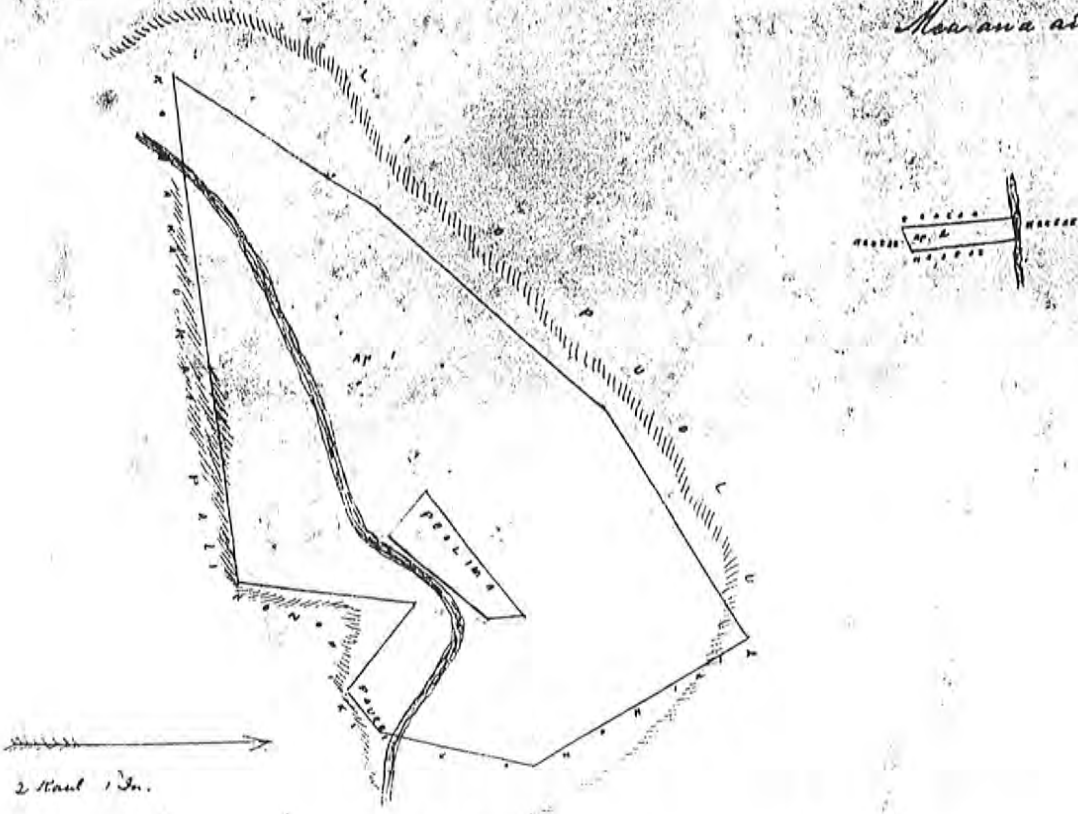
1850 P. 193V Honolulu June 15 1852

Handwritten title

Kelua 3717 13 Hawaii Puhua & Hanohi Maui

Apr 1 Hawaii Maui Puhua & Hanohi Maui  
 Kii Puhua Maui Ke 52 1/2 No 36 Kii Puhua A 53 No 154 Kii Maui Ke 8 1/4 No 254 Kii Maui Ke 8 1/4 No 394 Kii Maui Ke 84 No 323 Kii Maui Ke 4 1/2 No 347 Kii Maui Ke 4 1/2 No 393 Kii Maui Ke 3 1/4 No 351 Kii Maui Ke 11 No 221 Kii Maui  
 Puhua Maui & Hanohi Maui Ke 13 1/2 No 105 Kii Maui Ke 4 1/2 No 183 Kii Maui A 52 1/2 No 81 Kii Maui A 46 1/4 No 221 Kii Maui  
 Apr 2 Kii Maui Puhua & Hanohi Maui Ke 8 1/4 No 125 Kii Maui Ke 8 1/4 No 106 Kii Maui A 60 1/4 No 35 Kii Maui A 60 1/4 No 106 Kii Maui

John J. Gower  
Maui ana ana



Whu Pau 3717 #7

H. L. Lee  
G. W. Robertson  
J. H. Smith  
A. Kekaulahao

Honolulu June 15 1852

EXHIBIT E-3B



REGISTRATION & DECLARATION OF WATER USE  
PROCESSING OF FORMS

SCREENING FOR ACCEPTANCE OF DECLARATIONS

FILE REFERENCE: Lapenia L

Screened by: Tom N

SUFFICIENCY OF INFORMATION

For each form, has sufficient information been submitted to determine:

- (1) whether or not filer has an existing use of water?  
If a existing use, has sufficient information been submitted to determine:
- (2) the location of source (i.e., a suitably marked map or reference);
- (3) the manner of taking (i.e., how water is removed from source);
- (4) the type of use and some indication of the quantity of use?

yes

If no to any of above, enter date of request for more information:

CONTENT OF INFORMATION

Does the filer declare an existing use of water from:

- Well(s) owned or operated by filer? .....
- Stream diversion(s) owned or operated by filer? .....
- End use from non-municipal, non-state system? .....
- Instream use or riparian use with no diversion? .....

(yes/no)
<u>yes</u>
<u>yes</u>
<u>yes</u>
<u>yes</u>

If yes for any of the above, describe the use:

Water is diverted from Puolua Stream  
to raise 3/4 acres of banana and Taro.  
Water from Hanehoi Stream is used to  
raise 1 1/2 acres of taro and banana.

Has the filer submitted forms to register or declare:

- Unused existing well, spring or stream diversion? ...
- Appurtenant or kuleana water rights claim? .....

yes

Has the filer submitted forms to declare:

- Proposed future developments and uses? .....
- Non-appurtenant claims for water rights? .....
- System end use from a municipal or state-run water system? .

yes

AUTHORIZATION FOR NATIVE HAWAIIAN ADVISORY COUNCIL, INC. TO FILE

May 23 1989

To whom it may concern:

I hereby authorize the Native Hawaiian Advisory Council, Inc. and its agents to assist me in filing my water use declaration. If I complete my declaration by phone or am otherwise not able to sign my declaration form, I authorize the Native Hawaiian Advisory Council, Inc. and its agents to sign and submit my declaration form for me.

A dated and signed photocopy of this authorization will have the same force and effect as an original.

Lehua Lapenia

(please sign your name)

Lehua Lapenia

(please print your name)

P.O. Box 602

Haiku, HI 96708

Address

### SUPPLEMENTAL DECLARATION FOR ALL OWNERS OR USERS OF WATER

1. The following statement is in my own words and describes the basis of the evidence that allows me to lay claim to these water rights or uses: (identify type of evidence, witnesses, past use, projected use and any changes if applicable; when complete attach this form to the State of Hawaii Declaration of Water Use form that is applicable) I claim:

APPURTENANT WATER RIGHTS  
Tax Key 2-9-08-31 1.5 acre  
Tax Key 2-9-008-14 3/4 acre  
From the best of my knowledge the land was handed down to me by my grandmother from her husband (my grandfather now deceased) since late 1800's and early 1900's by his grandparents. I use only parcel of the land for planting taro's and banana's. When the land is cleared I will use the whole parcel for planting taro.

2. I  did or  did not ~~not~~ receive notice from the State of Hawaii Commission on Water Resource Management regarding the registration and declaration of water use.

3. I declare that the contents of the above Supplemental Declaration of Water Use are the truth to the best of my knowledge.

Water User's Signature: Lehua Lapenia Date: 5-23-89  
Printed Name: Lehua Lapenia

Form 0810-2



89 M

ORIGINAL

MAY 30 1989

STATE OF HAWAII  
COMMISSION ON WATER RESOURCE MANAGEMENT  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER RESOURCE MANAGEMENT

REGISTRATION OF STREAM DIVERSION WORKS  
AND  
DECLARATION OF WATER USE

INSTRUCTIONS: Please type or print. If information is not available or not applicable, indicate as N/A. Fill out as completely as possible, sign, and mail form to the Division of Water Resource Management, P.O. Box 373, Honolulu, Hawaii 96809. Phone 548-3948 or 548-7543 for assistance.

MULTI-SOURCE SYSTEMS: For a system of two or more diversion structures, submit a single package to describe the complete system. Include a single location map (or a set of maps if required) showing all diversion structures and measurement points, and a separate copy of this form for each structure and measurement point. On forms describing diversion structures, complete parts A, B, D, and E. On forms describing measurement points, complete parts A, B, and F.

STREAM NAME: Puolua stream ISLAND: Mau  
DIVERSION STRUCTURE NAME: Awai directly off stream  
DIVERSION SYSTEM NAME: \_\_\_\_\_

A. DIVERSION WORKS OPERATOR

Firm name: \_\_\_\_\_  
Contact person: \_\_\_\_\_  
Address: \_\_\_\_\_  
Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

B. OWNER OF DIVERSION WORKS SITE

Firm name: \_\_\_\_\_  
Contact person: \_\_\_\_\_  
Address: \_\_\_\_\_  
Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

C. STREAM DIVERSION LOCATION

Tax Map Key: 2-9-009-14 Town, Place, District: Hauku  
Attach USGS "Quad" map (scale 1:24,000), tax map, or other map showing the diversion location.

D. STREAM DATA

Streamflow at diversion site is:  Perennial (Water is always flowing)  Intermittent (Channel is sometimes dry)  
Is streamflow gaged?  Yes  No  
If yes, provide gage name, and show location on map. Name: N Av  
Average flow before diversion: \_\_\_\_\_  mgd  gpm  cfs

E. DIVERSION STRUCTURE DATA

Year constructed: early 1900s Elevation (above mean sea level): N Av  
Diversion structure is:  Concrete  Wood  Pipe  Other (Describe): \_\_\_\_\_  
Diverted flow is:  Controlled  Uncontrolled  
Divertable capacity is: N Av  mgd  gpm  cfs

Submit an "as-built" drawing and dated photograph of the diversion works, if available.

... (continued over)

For Official Use Only:

Date received: \_\_\_\_\_ Date accepted: \_\_\_\_\_  
Field checked by: \_\_\_\_\_ Date: \_\_\_\_\_ Latitude: \_\_\_\_\_ Hydrologic Unit: \_\_\_\_\_  
Comments: \_\_\_\_\_ Longitude: \_\_\_\_\_ State Diversion No.: \_\_\_\_\_

NOTE: The purpose of the Declaration of Water Use is to obtain information necessary for the management of the State's water resources. The Declaration does not confer a legal right to water or its use.

1A110170

Location and name of measurement point (Show on location map): N Av

Water use data are recorded:  Continuously  Daily  Other: \_\_\_\_\_

Method of measurement (Check box and describe below):  Weir  Rating flume  Other

Description: \_\_\_\_\_

Quantity of Use (Report gaged or estimated monthly water use from the diversion described on the reverse side of this form, for the calendar years 1983 through 1987):

WATER USE, IN N/Av (unit of measurement)

	1983	1984	1985	1986	1987
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
ANNUAL					

Typical times of usage: daily

Type of Use (Check all category boxes that apply and provide additional information as indicated.):

Category	Additional Information
<input type="checkbox"/> Municipal (including resorts, hotels, businesses)	_____
<input type="checkbox"/> Domestic (systems serving 25 people or less)	Number of service connections: _____
<input checked="" type="checkbox"/> Irrigation	Acres irrigated: <u>approx 3/4 acre</u>
	Crop(s): <input type="checkbox"/> Sugar <input type="checkbox"/> Pineapple
	<input checked="" type="checkbox"/> Other (specify): <u>farm bananas</u>
	Non-Crop: <input type="checkbox"/> Landscape <input type="checkbox"/> Golf Course
	<input type="checkbox"/> Other (specify): _____
	Method: <input type="checkbox"/> Drip <input type="checkbox"/> Furrow <input type="checkbox"/> Sprinkler
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling <input type="checkbox"/> Manufacturing <input type="checkbox"/> Mill
<input type="checkbox"/> Military	_____
<input checked="" type="checkbox"/> Other	Specify (livestock, hydroelectric, aquaculture, etc.): <u>Own use</u> <u>Farm + banana</u>

Location of Use (Describe the location of water use, relative to the diversion, and include on location map. If water is used by others, submit a list of their names and addresses.):  
2-9-008-14

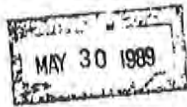
I declare that the contents of the above Declaration of Water Use are, to the best of my knowledge and belief, true, correct, and complete.

Water User's Signature: Lehua Lapena Date: 5-23-88  
 Printed Name: Lehua Lapena  
 Firm or Title (Diversion Operator, etc.): \_\_\_\_\_

4402 M159

*mm*  
*or*

Form 8010-2



STATE OF HAWAII  
COMMISSION ON WATER RESOURCE MANAGEMENT  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER RESOURCE MANAGEMENT

0011087 P 2107

REGISTRATION OF STREAM DIVERSION WORKS  
AND  
DECLARATION OF WATER USE

**INSTRUCTIONS:** Please type or print. If information is not available or not applicable, indicate as N/A. Fill out as completely as possible, sign, and mail form to the Division of Water Resource Management, P.O. Box 373, Honolulu, Hawaii 96809. Phone 548-3948 or 548-7543 for assistance.

**MULTI-SOURCE SYSTEMS:** For a system of two or more diversion structures, submit a single package to describe the complete system. Include a single location map (or a set of maps if required) showing all diversion structures and measurement points, and a separate copy of this form for each structure and measurement point. On forms describing diversion structures, complete parts A, B, D, and E. On forms describing measurement points, complete parts A, B, and F.

STREAM NAME: Hanehoi Stream ISLAND: Mau  
DIVERSION STRUCTURE NAME: Awai directly off stream  
DIVERSION SYSTEM NAME: \_\_\_\_\_

**A. DIVERSION WORKS OPERATOR**

Firm name: \_\_\_\_\_  
Contact person: \_\_\_\_\_  
Address: \_\_\_\_\_  
Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

**B. OWNER OF DIVERSION WORKS SITE**

Firm name: \_\_\_\_\_  
Contact person: \_\_\_\_\_  
Address: \_\_\_\_\_  
Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

**C. STREAM DIVERSION LOCATION**

Tax Map Key: 2-9-08-31 Town, Place, District: Haiku, Maui  
Attach USGS "Quad" map (scale 1:24,000), tax map, or other map showing the diversion location.

**D. STREAM DATA**

Streamflow at diversion site is:  Perennial (Water is always flowing)  Intermittent (Channel is sometimes dry)  
Is streamflow gaged?  Yes  No  
If yes, provide gage name, and show location on map. Name: \_\_\_\_\_  
Average flow before diversion: \_\_\_\_\_  mgd  gpm  cfs

**E. DIVERSION STRUCTURE DATA**

Year constructed: 1905 Elevation (above mean sea level): N/A  
Diversion structure is:  Concrete  Wood  Pipe  Other (Describe): dirt  
Diverted flow is:  Controlled  Uncontrolled  
Divertable capacity is: N/A  mgd  gpm  cfs

Submit an "as-built" drawing and dated photograph of the diversion works, if available.

... (continued over)

**For Official Use Only:**

Date received: \_\_\_\_\_ Date accepted: \_\_\_\_\_  
Field checked by: \_\_\_\_\_ Date: \_\_\_\_\_ Latitude: \_\_\_\_\_ Hydrologic Unit: \_\_\_\_\_  
Comments: \_\_\_\_\_ Longitude: \_\_\_\_\_ State Diversion No.: \_\_\_\_\_

References: Hawaii Revised Statutes, Chapter 174C.  
Hawaii Administrative Rules, Chapters 13-167 to 13-171.

F. DECLARATION OF WATER USE

NOTE: The purpose of the Declaration of Water Use is to obtain information necessary for the management of the State's water resources. The Declaration does not confer a legal right to water or its use.

Location and name of measurement point (Show on location map): N/A

Water use data are recorded:  Continuously  Daily  Other: \_\_\_\_\_

Method of measurement (Check box and describe below):  Weir  Rating flume  Other  
Description: \_\_\_\_\_

Quantity of Use (Report gaged or estimated monthly water use from the diversion described on the reverse side of this form, for the calendar years 1983 through 1987):

WATER USE, IN N/A (unit of measurement)

	1983	1984	1985	1986	1987
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
ANNUAL					

Typical times of usage: daily

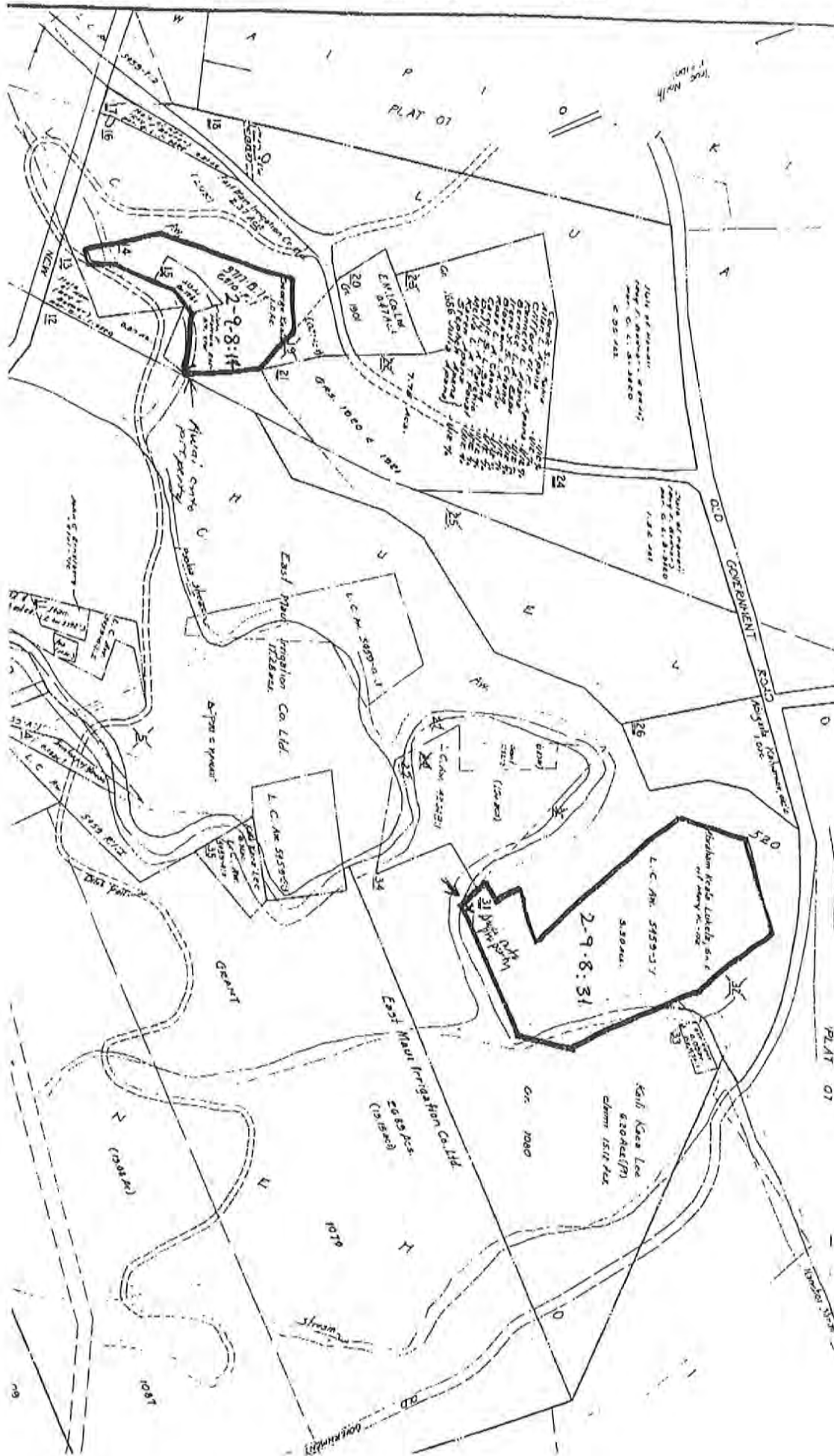
Type of Use: (Check all Category boxes that apply and provide additional information as indicated):

<b>Category</b>	<b>Additional Information</b>
<input type="checkbox"/> Municipal (including resorts, hotels, businesses)	_____
<input type="checkbox"/> Domestic (systems serving 25 people or less)	Number of service connections: <u>old days - 3-3 acre</u>
<input checked="" type="checkbox"/> Irrigation	Acres irrigated: <u>approx 1.5 acre now</u>
	Crop(s): <input type="checkbox"/> Sugar <input type="checkbox"/> Pineapple
	<input type="checkbox"/> Other (specify): <u>taro, banana</u>
	Non-Crop: <input type="checkbox"/> Landscape <input type="checkbox"/> Golf Course
	<input type="checkbox"/> Other (specify): _____
	Method: <input type="checkbox"/> Drip <input type="checkbox"/> Furrow <input type="checkbox"/> Sprinkler
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling <input type="checkbox"/> Manufacturing <input type="checkbox"/> Mill
<input type="checkbox"/> Military	<input type="checkbox"/> Other (specify): _____
<input type="checkbox"/> Other	Specify (livestock, hydroelectric, aquaculture, etc.): <u>OWN USE FOR TARO &amp; BANANA</u>

Location of Use (Describe the location of water use, relative to the diversion, and indicate on location map. If water is used by others, submit a list of their names and addresses):  
see map 2-9-08-31

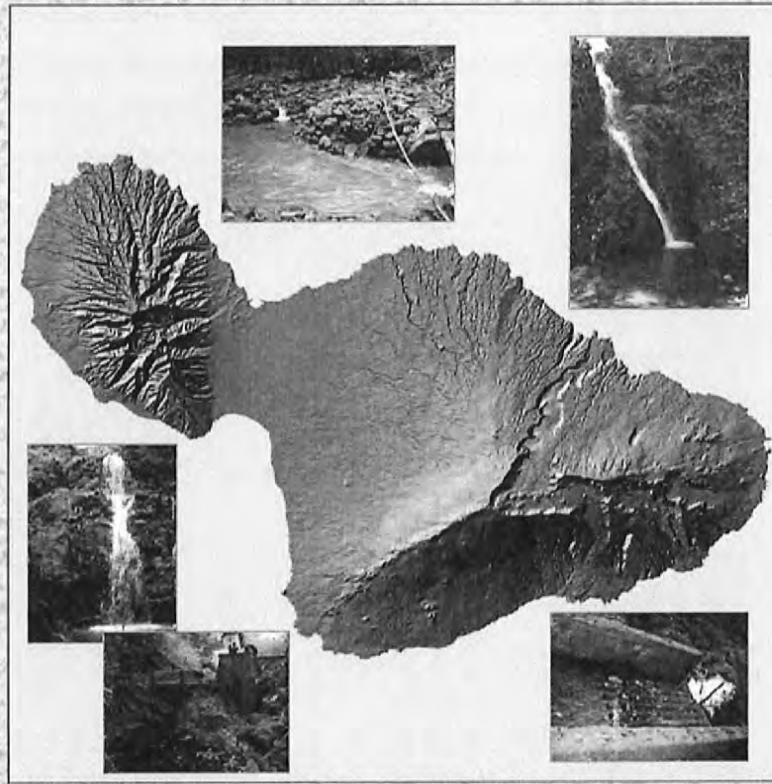
I declare that the contents of the above Declaration of Water Use are, to the best of my knowledge and belief, true, correct, and complete.

Water User's Signature: Lehua Lapenia Date: 5-23-89  
 Printed Name: Lehua Lapenia  
 Firm or Title (Diversion Operator, etc.): \_\_\_\_\_





# Report on Hanehoi Stream Maui, Hawaii



**June 2008**

State of Hawai'i  
Department of Land and Natural Resources  
Division of Aquatic Resources



**EXHIBIT E-5**

Upper Reach:

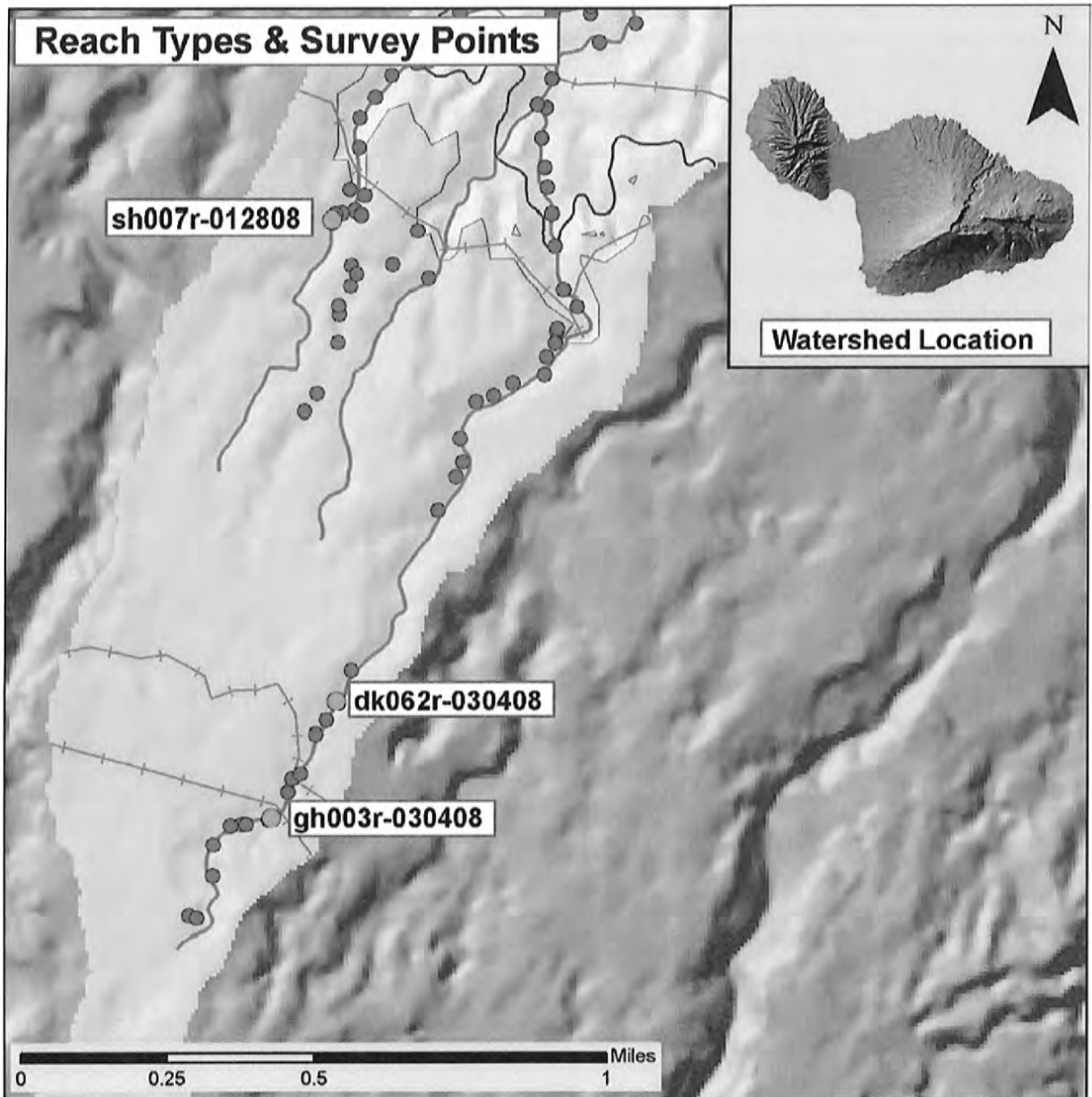


Figure 2. Locations of DAR Point Quadrat Surveys done in the upper reach of Hanehoi Stream. Blue dots are survey locations and green dots are location with photographs. The hatched orange lines are irrigation ditches. The colors represent the different reach delineations. Labels are associated photograph site code.

## Section 1: Overview

### Introduction:

This report is an accounting of the aquatic resources that have been observed in Hanehoi Stream, Maui. The report was generated to provide some information to aid in the instream flow determination for the East Maui Streams at the request of the Commission on Water Resource Management (CWRM). The focus of this report is the animals that live in the stream and the data collected during surveys of the stream. The report covers six main sections, including:

- Overview
- Watershed Atlas Report
- DAR Point Quadrat Survey Report
- DAR Insect Survey Report
- An Analysis of Depth Use vs. Availability
- Photographs of stream taken during stream surveys

The overview provides the introduction for the purpose of this report, a summary of the findings on the stream and its animals, and a discussion of the importance of the findings and how stream conditions influence native species populations. The Watershed Atlas Report provides a description of the watershed and its aquatic resources from Division of Aquatic Resources (DAR) and other published and unpublished surveys as well as a rating of the condition of the stream compared to other streams on Maui as well as statewide. The DAR Point Quadrat Survey Report describes the distribution, habitats, and species observed during the standardized DAR stream surveys. The DAR Insect Survey Report describes the distribution, habitats, and species of insects observed in the stream. The analysis of depth use vs. availability looks at habitat use by native species and the availability of suitable depths in the stream. Finally, the photographs provide context to the conditions that the stream surveyors encountered in the stream.

This overview reports on the highlights of these findings and provides a discussion of the importance of the information presented. We hope that this format provides the reader with a simplified, general discussion and understanding of the condition of Hanehoi Stream while also providing substantial evidence to support the conclusions presented.

### Findings for Hanehoi Stream, Maui:

Hanehoi is a small (1.5 sq miles), narrow watershed. It is mostly zoned conservation (68%) and agricultural (32%) and the land cover is mostly evergreen forest (68%), scrub (10%), and grassland (20%). Above the Hana Highway the remnants of ancient taro patches (loi) still exist. These taro patches are no longer in use. Cattle ranching take place in this watershed. Point quadrat and aquatic insect surveys of have been completed in Hanehoi Stream with the earliest surveys recorded from 1929 and have continued to

the present. This watershed rates below average in comparison to other watersheds in Maui and statewide. It has a total watershed rating of 6 out of 10, a total biological rating of 2 out of 10, and a combined overall rating of 4 out of 10.

Native species observed in the stream include the following categories and species:

Fish – no native fish species observed.

Crustaceans - *Atyoida bisulcata*

Mollusks – no native mollusk species observed.

Introduced species observed in this stream includes the following categories and species:

Fish - *Poecilia reticulata* and *Xiphophorus helleri*

Crustaceans - *Macrobrachium lar* and *Procambarus clarkii*

Mollusks – *Melanoides tuberculata* and *Physidae*

A total of 17 species of aquatic insects were collected during 3 days of sampling along Hanehoi Stream. Of the insects collected 11 species, or 65 percent of the total, were considered native to the Hawaiian Islands. Two native dragonflies were observed: *Anax strenuus* and *Pantala flavescens* and two native damselflies: *Megalagrion nigrohamatum nigrohamatum*, and *Megalagrion pacificum* which is currently a candidate for listing as an endangered native damselfly.

The only native amphidromous animal observed was *Atyoida bisulcata*. Not enough observations were made to determine depth suitability patterns, but the average depth at which *Atyoida bisulcata* was observed was 22.5 inches deep. The diversions resulted in an increase frequency of dry or shallow sites as compared to streams statewide. The distribution of depths in comparison to elevation showed that the stream was shallower downstream of diversions than would be expected in a normal stream. This is likely restricting habitat for climbing native amphidromous animals.

Photographs were taken of interesting features of stream habitat and diversions. Photographs show Hanehoi is a small stream and that dry sections exist downstream of diversions. The diversions also created migratory barriers for upstream and downstream movement of amphidromous animals. The photos show that most suitable habitat is now found upstream of the highest diversion.

Discussion for Hanehoi Stream, Maui:

Hanehoi Stream is a small and steep stream with many large waterfalls making access to some areas difficult. The stream has a waterfall near the mouth of the stream which will limit upstream migration of non-climbing native amphidromous animals. Currently little water exists in this stream.

During the surveys of the middle reach of Hanehoi Stream, all fish and macroinvertebrates observed were introduced species. None of the expected native animals were seen in this reach. The only native animal observed was Atyid shrimp in the upper reach of Hanehoi Stream. The lack of water in the downstream reaches likely

prevents most of the upstream migration of native animals and provides little habitat to animals that do make the upstream journey. Overall, the observed fish and macroinvertebrate assemblage in Hanehoi suggests that conditions in the stream are unsuitable for most native species to exist.

Hanehoi Stream contains a highly degraded aquatic insect biota in its lower reaches that have been dewatered by ditch diversions, while by contrast supporting a robust, native-dominated aquatic insect assemblage in the upper reaches above the points of diversion. The latter assemblage also contains one species, the native damselfly *Megalagrion pacificum*, that is currently proposed for listing as Endangered under the federal Endangered Species Act. Restoration of flow to the dewatered sections of this catchment would in all likelihood result in a corresponding restoration of native aquatic insect diversity, but only if steps were taken to avoid utilizing ditch waters that are heavily colonized by invasive poeciliid fishes (mosquitofish, swordtails, etc.).

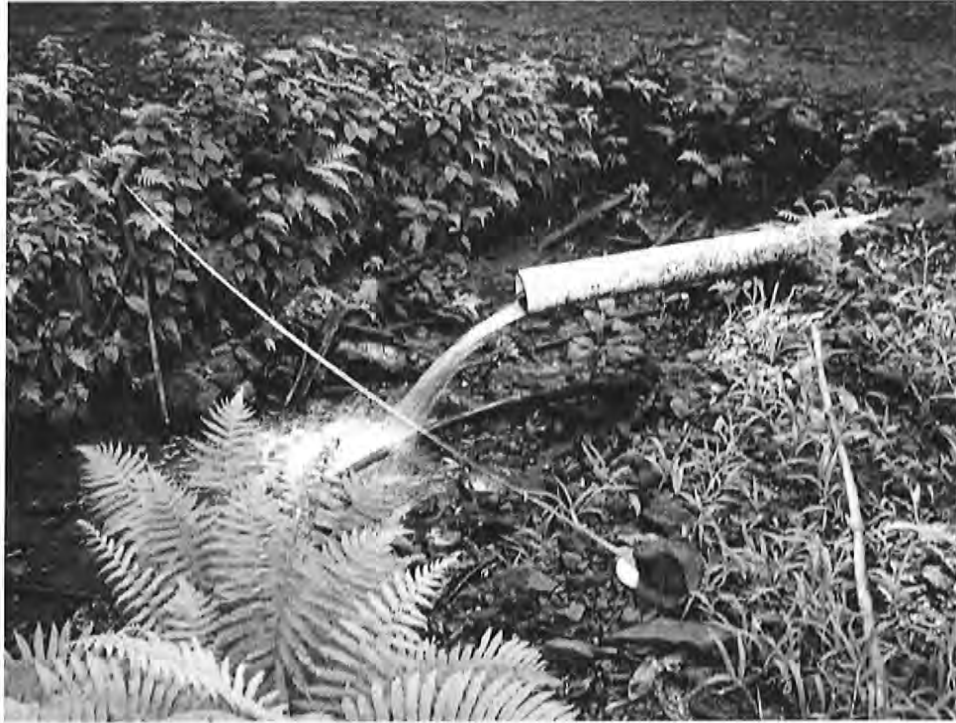
Hanehoi Stream and its watershed do not rate highly when compared to other streams on Maui and statewide. This suggests that Hanehoi Stream has limited potential to be a high quality stream with substantial habitat for a wide range of native animals. Much of the low rating score comes from the observation of few native animals in comparison to introduced animals. While the natural stream morphology of Hanehoi stream may limit its suitability for a wide range of native amphidromous animals, Hanehoi should be expected to contain *Lentipes concolor*, but this species has not been observed in the stream. Restoration of stream flows would likely benefit upstream species such as *Lentipes concolor*, *Atyoida bisulcata*, and native insects.

No surveys have been done for larval recruitment on this stream. The terminal waterfall likely restricts a number of species from migrating into this stream, although *Lentipes concolor* was expected to be present it was not observed. For the animals that do make it into Hanehoi Stream, the natural downstream drift of newly hatched larvae is interrupted by the stream diversion. The water from the stream is diverted into irrigation ditches and likely entrains any downstream drifting larvae.

Crayfish, *Procambarus clarkii*, and juvenile poeciliids were observed in the stream near the Jeep Trail by Lowrie Ditch. These introduced species can continuously restock their populations in the middle and lower reaches of the stream from these upstream sources, so large flood events are unlikely to eliminate them from the stream. Control of introduced species would be important to achieve the maximum biological benefit from an increase in stream flow.

This stream is currently intermittent as a result of multiple diversions. This is not a large stream and may have become intermittent naturally in periods of prolonged drought, although the stream is now nearly permanently intermittent as a result of water diversions. The intermittent nature of this stream currently reduces habitat and restricts instream migration for the native animals. A more consistent flow would reconnect habitats and allow for upstream migration of native species.

There are three different diversion sites on this stream. In addition to the water removed by the irrigation ditches, there are two pipes providing downstream water for taro farmers. The majority of habitat for stream animals is absent in the stream as a result of the water diversions. A major issue regarding the diversions on Hanehoi Stream is the use of pipes at the diversions which restrict downstream flow and prohibit upstream migration. Currently, there is little ability for upstream migration as a result of the design of the diversion even when water is flowing down the natural stream channel.



Pipe over Lowrie Irrigation ditch Hanehoi Stream (above Hana Highway and Ernie Schupp). Pipes make it difficult or impossible for upstream migration of native animals except at flood flows when the diversion is completely overtopped by the stream flow.



One pipe allowed to flow over irrigation ditch

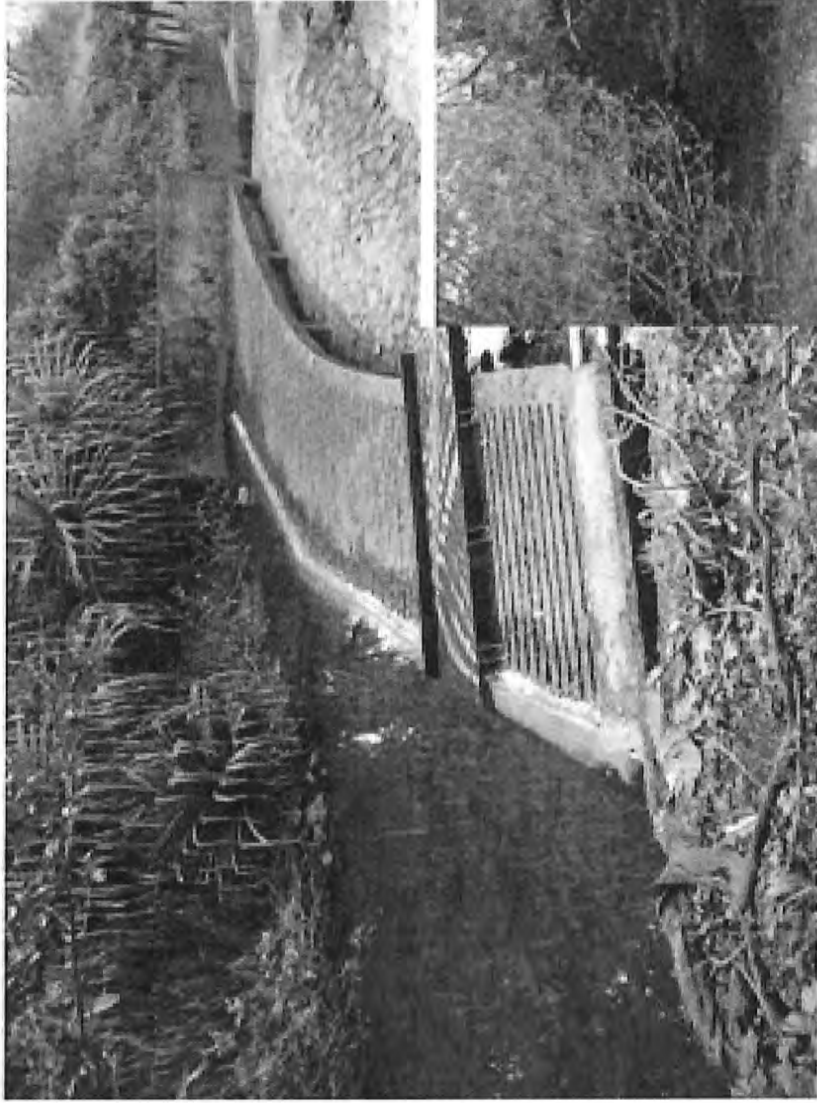


Puolua Stream flowing into Lowrie Irrigation Ditch. Any downstream larval drift would be captured by the irrigation ditch.



Note the two pipes on the right that pass over the ditch and transport water from stream. They are connected to one pvc pipe which empties back into the stream downstream.





A  
Low flow bypass example  
Honopou St. Haiku Ditch



HCS-NHLC-EQUEST-00-500002

B

Exhibit E- 6 A-B



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
P.O. BOX 621  
HONOLULU, HAWAII 96809

STAFF SUBMITTAL

for the meeting of the  
COMMISSION ON WATER RESOURCE MANAGEMENT

September 24, 2008  
Haiku, Maui

Petition to Amend the Interim Instream Flow Standards  
for the Surface Water Hydrologic Units of  
Honopou (6034), Hanehoi (6037), Piinaau (6053),  
Waiokamilo (6055), and Wailuanui (6056), Maui

PETITIONER:

Na Moku Aupuni O Koolau Hui, Beatrice Kekahuna, and Marjorie Wallett  
c/o Native Hawaiian Legal Corp.  
1164 Bishop Street  
Honolulu, HI 96813

LOCATION MAP: See Exhibit 1

SUMMARY OF REQUEST:

Staff is requesting that the Commission consider the recommendations for eight (8) Petitions to Amend the Interim Instream Flow Standards for streams contained within the following five (5) surface water hydrologic units in the region of east Maui (See Exhibit 2).

HONOPOU (6034)

- Honopou Stream

HANEHOI (6037)

- Hanehoi and Puolua (Huelo) Streams

PIINAUU (6053)

- Piinaau Stream
- Palauhulu Stream

**EXHIBIT** E-7

### E. Proposed Adaptive Management Strategy

Interim IFS A is proposed to ensure that an adequate amount of water reaches the downstream diversions, which are primarily for domestic use and taro cultivation. Interim IFS B is proposed to protect the biological integrity in the lower reaches of the stream, downstream from all diversions. The effects of flow restoration on stream biota and habitat availability are unknown. Therefore, staff proposes adopting an adaptive management program that may include the following:

Staff proposes the following hydrologic unit-specific adaptive management strategies:

- EMI, in coordination with staff, shall consider alteration of the diversion at Haiku Ditch to allow for the upstream migration of native aquatic species across the diversions. Currently, the EMI diversion at Haiku Ditch takes all the base flow except that which flows through three 4-inch (outside diameter) pipes.

Staff proposes the following general adaptive management strategies:

#### IMPLEMENTATION

- Staff shall seek to enforce the provisions of the State Water Code should any unauthorized, non-registered or non-permitted diversions be discovered in the course of its fieldwork. Staff recommends that all owners of unauthorized diversion works structures contact staff to file the necessary applications to seek compliance with all permitting requirements set forth by the Code.
- Staff shall coordinate with EMI to identify and determine appropriate actions with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall coordinate with other registered stream diversion works owners with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall assess the existing condition and status of all EMI diversions, in coordination with EMI and Division of Aquatic Resources (DAR) staff, to determine if any modifications are necessary to improve habitat conditions for stream biota.

#### MONITORING

- Staff shall monitor streamflow by taking periodic flow measurements, subject to available funding, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota to post-interim IFS implementation.
- Any party claiming to be negatively impacted as a result of the adopted interim IFS shall monitor and document, in cooperation with staff, the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- Likewise, any party claiming that negative impacts are a direct result of actions (i.e., diverting too much water, violating the interim IFS) caused by another party, shall monitor and document the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.

## **HANEHOI (6037)**

### A. Interim IFS Assessment Summary

#### Hydrology

- There currently is very little flow in Hanehoi Stream. There are no data on whether Hanehoi and Huelo (Puolua) Streams are losing or gaining flow from ground water.
- Residents reported the streams traditionally (pre-1960s) had continuous flow except in times of drought. Archaeological evidence of extensive taro lo'i along the lower reaches of the streams suggests that water was once readily available.
- The Haiku, Lowrie, New Hamakua, and Wailoa Ditches are four active diversion systems that are currently capturing base flow from the streams.
- Measured streamflow data are limited for Hanehoi and Huelo (Puolua) Streams. Flow statistics were estimated with regression equations, and they are illustrated in Section D, Simplified Diagrams. Since Hanehoi is outside of the study area in which the regression equations were developed, the estimated flow statistics may not be representative of the flow conditions in Hanehoi and Huelo (Puolua) Streams.
- Streamflow data from long-term gaging stations around the islands indicate that monthly mean total and base flows have generally decreased from the 1940s to 2002. This is consistent with decreasing rainfall trends statewide. Changing streamflow characteristics could pose a negative effect on the availability of drinking water for human consumption and habitat for native stream fauna.

#### Maintenance of Fish and Wildlife Habitat

- Hanehoi Stream has degraded native aquatic and insect biota in the middle and lower reaches. Large sections of the stream are currently unsuitable habitat for native animals. Only the native mountain opae were observed and are present in the upper reaches. Native dragonflies and damselflies were observed in the upper reaches as well.
- Use of pipes in diversion structures blocks upstream migration of native amphidromous species.
- By dewatering different sections of the stream, diversions create disconnected deep pools in the stream to which adult animals inhabiting them are restricted.
- Restoration of streamflow and increased continuity in flow could lead to the development of a richer and more native-dominated community in the stream. However, care must be taken to not introduce invasive species through the release of water from irrigation ditches.
- The terminal waterfall at the mouth of the stream would likely restrict upstream migration.

#### Outdoor Recreational Activities

- The HSA classified the recreational resources of Hanehoi Stream as "limited", with no identified recreational resources.
- Approximately 30 percent of the Hanehoi hydrologic unit is public hunting area.
- Public comments indicate that a reduction in streamflow over the last 20 to 30 years has dramatically reduced recreational opportunities in east Maui streams, including Hanehoi Stream.

- Residents reported recently established agricultural educational centers that have access to the stream through traditional trails. Environmental groups have utilized the centers and the trails to offer educational hikes and other activities.

#### Maintenance of Ecosystems

- Almost 70 percent of the Hanehoi hydrologic unit is within the East Maui Watershed Partnership management area.
- The upper slopes of the Hanehoi hydrologic unit are reserves and wetlands, dominated by native plants.
- The estimated Net Present Value of the amenities offered by the Koolau Forest Reserve is 7 to 14 billion dollars. Approximately 30 percent of the Honopou hydrologic unit lies in the Koolau Forest Reserve.
- The east Maui watershed is the single largest source of surface water in the state, and it is home to the largest concentration of endangered native forest birds.

#### Aesthetic Values

- Opportunities for scenic enjoyment are available where Hanehoi Stream crosses Hana Highway.

#### Maintenance of Water Quality

- Hanehoi and Huelo (Puolua) Stream are mostly Class 2 inland waters, protected for recreational and agricultural uses, and aquatic life.

#### Conveyance of Irrigation and Domestic Water Supplies

- Seven out of 12 diversions were registered under EMI. Of the five non-EMI diversions, one was declared for domestic purposes. Four diversions utilized water for irrigation of crops and livestock, including taro cultivation. The diversion for domestic purposes serves approximately 30 families, or approximately 100 people in the Huelo community.

#### Protection of Traditional and Customary Hawaiian Rights

- Of the five non-EMI diversions, two declared water use for taro cultivation with an estimated cultivable area of 2.3 acres.
- Twenty-five testimonies were submitted by the NHLC addressing insufficient water flow that is affecting taro cultivation and traditional gathering practices in the east Maui streams.
- Residents reported archaeological evidence of extensive taro loi along the lower reaches of the streams. They also reported cultural remains of auwai and ancient terraces in Hanehoi.
- A large proportion (about 70 percent) of the water diverted by EMI originates on State lands under revocable permits. Appurtenant rights of taro growers are public trust purposes recognized by the Code and respected as the highest form of protection. Traditional and customary native Hawaiian rights are constitutionally protected.

#### Noninstream Uses

- There are 12 registered major diversions on Honopou Stream, seven of which are registered by EMI. There are also seven EMI minor diversions.

- The EMI system primarily captures surface water from multiple watersheds in east Maui with a combined area of approximately 56,000 acres. The system delivers an average of 37 percent (165 million gallons per day) of its delivery capacity. Approximately 70 percent of the water delivered via the system emanates from State lands, for which A&B and EMI currently hold revocable permits for the four license areas.
- The HC&S plantation consists of 43,300 acres of land. Sugar is cultivated on 37,000 acres while the rest, which are unsuitable for cultivation, are leased to third parties. The majority of the sugarcane fields are irrigated with water delivered by EMI and supplemental ground water pumped by HC&S. The amount of water HC&S claims to need from EMI ranges from 134 to 268 million gallons per day (mgd) in the winter and summer months, respectively.
- Testimony indicates that HC&S helps supplement the local economy, which is very critical during this time of recession. It provides over 800 jobs and supports large and small businesses alike. HC&S is an economic pillar in the community. A&B and its companies help Maui's communities through its Foundation, through which numerous organizations receive much-needed funding and in-kind services.
- HC&S receives revenue from 1) sale of sugar and molasses, 2) sale of electricity to Maui Electric Company (MECO), 3) delivery of water to the County of Maui Department of Water Supply's (DWS) Upcountry system, and 4) delivery of water to Maui Land and Pineapple Company, Inc (MLP) for its east Maui pineapple fields.
- Among the three Upcountry DWS water systems (i.e., Makawao, Upper Kula, and Lower Kula), only the Makawao water system is served by EMI through the Wailoa Ditch. This system receives 8.2 mgd from EMI, a portion of which goes to the Kula Agricultural Park. With rising populations, the water demand in Upcountry Maui is expected to increase.
- MLP cultivates 6,000 acres of pineapple, of which over 2,800 acres are situated in east Maui and rely on EMI for water. The amount of water MLP claims to need from EMI is 4.5 mgd.
- Since over half of the irrigation water for west and central Maui comes from east Maui, decreasing the amount of water diverted at the ditches located in the east affects the amount of water available for the irrigation of crops in the west and central parts of Maui.
- Compared to periods of lower than average rainfall, prolonged loss of irrigation water caused by a decrease in the amount of water diverted by irrigation ditches has greater effects on the long-term trends of ground water levels.

#### B. Additional Considerations

- Maui Tomorrow states that the unmet demand for additional streamflow is poorly represented in the draft IFSAR. Hanehoi Stream is a primary source of domestic water for nearly 100 Huelo area residents. There is rarely water available in residents' sections of the stream under present conditions so they are not using the stream water for their crops.
- HC&S states that Ernest Schupp complained there was not enough cool water for his auwai just below Haiku Ditch. A site visit conducted by HC&S indicated that the auwai was not in use. BLNR ruled that there was enough water for Mr. Schupp's taro needs. HC&S argues that there is no need to amend the interim IFS for Hanehoi Stream to accommodate taro cultivation in Hanehoi.

## C. Proposed Interim IFS and Rationale

Interim IFS A

Proposed Location: Lower reach of Huelo (Puolua) Stream near 420 feet elevation, downstream of Haiku Ditch. This is the location of the ungaged site, station HueIL.

Proposed Interim IFS: 0.89 cubic feet per second, 0.57 million gallons per day

Interim IFS B

Proposed Location: Lower reach of Hanehoi Stream near 420 feet elevation, downstream of Haiku Ditch.

Proposed Interim IFS: 0.63 cubic feet per second, 0.41 million gallons per day

Interim IFS C

Proposed Location: Lower reach of Hanehoi Stream, upstream of Lowrie Ditch and the diversion of water for domestic use in the Huelo community.

Proposed Interim IFS: 1.15 cubic feet per second, 0.74 million gallons per day

Rationale

Under the current flow conditions, Hanehoi and Huelo (Puolua) Streams have limited recreational and aesthetic opportunities. The presence of agricultural educational centers within the hydrologic unit signifies that the streams have the potential for providing high quality educational and recreational experiences. Regarding stream biota, the streams have poor aquatic and insect diversity in the middle and lower reaches. This may be a result of the terminal waterfall, restricting upstream migration of certain native amphidromous species. The presence of dewatered sections in the stream, possibly caused by diversions, may affect habitat availability for native species. The streams currently support taro cultivation and the cultivation of other crops and livestock. The streams, particularly Hanehoi Stream, also support a large number of domestic users (approximately 30 families, totaling approximately 100 people) in the Huelo community, situated at the lower part of the hydrologic unit. Hanehoi and Huelo (Puolua) Streams are also important sources of irrigation water for EMI, with a total of twelve major diversions and seven minor diversions on the streams.

Staff believes that flow may need to be partially restored to the stream in order to balance the instream and noninstream uses of stream water. Flow restoration would increase the continuity of flow in the stream, which would enhance habitat availability and native species diversity. However, the presence of a terminal waterfall may continue to block the upstream migration of certain amphidromous species. Restoration of flow in the stream would also benefit the large number of surface water users downstream from the irrigation ditches.

Benefits of streamflow restoration may include improvement of the currently limited recreational opportunities offered by the stream, as well as further the protection and maintenance of the Koolau Forest Reserve.

Only estimated flow statistics are available to determine the interim IFS because no actual flow measurements were collected in these streams. The estimated low base flow value (BFQ<sub>95</sub>) of Hanehoi Stream is used as the starting point for the following reasons:

- The low base flow value (BFQ<sub>95</sub>) is generally similar to the low total flow value (TFQ<sub>95</sub>) at each unaged site, representing the flow in the stream 95 percent of the time (Q<sub>95</sub>);
- Since the regression equations tend to overestimate flow values, the low base flow value instead of the median base flow (BFQ<sub>50</sub>) is used to represent the natural base flow in the stream to ensure a more conservative approach in determining the interim IFS;
- In a USGS study, natural base flow is used as a standard to determine the relative native species habitat availability, which will be important for future comparisons; and
- Base flow instead of total flow estimates are used because major diversion structures are generally assumed to capture a majority of the base flow.

Due to the variable and abstract nature of base flow, it is best to associate this term with 70 to 90 percent of the total flow in the stream, or flow that is present in the stream 70 to 90 percent of the time. However, for ease of reference, this flow will be referred as “base flow” in the text.

The proposed interim IFS A and B are set on Huelo (Puolua) Stream and Hanehoi Stream, respectively, upstream of their confluence, to ensure that an adequate amount of surface water reaches users downstream from Haiku Ditch. According to the estimated flow statistics, the base flow that is present in the stream 95 percent of the time (BFQ<sub>95</sub>) at unaged site HaneL is 3.04 cubic feet per second (cfs), which is similar to the total flow that is present in the stream 95 percent of the time (3.07 cfs). In this case, BFQ<sub>95</sub> represents a conservative estimate of natural base flow for reasons stated in the previous paragraph. Based on the USGS study on habitat availability, when 50 percent of natural base flow is present in the stream, potentially 80 to 90 percent of the natural habitat for selected native species is available. Fifty percent of the natural base flow in Hanehoi Stream (3.04 cfs) is 1.52 cfs. This flow is assumed to maintain biological integrity of the stream. Although the research conducted by the USGS on habitat availability does not include Hanehoi as part of the study area, results of this study are the best information available to determine the needs of native species in the stream.

Since there is currently insufficient information for the Commission to determine whether Hanehoi Stream is gaining or losing ground water flow, the only reasonable assumption to make is that the tributaries of Huelo (Puolua) and Hanehoi Streams contribute to the 1.52 cubic feet of flow per second at unaged site HaneL. The proposed interim IFS for Huelo (Puolua) Stream is set at the low base flow value (BFQ<sub>95</sub>) of 0.89 cubic feet per second, and one for Hanehoi Stream is set at the 0.63 cfs (1.52 cfs minus 0.89 cfs equals 0.63 cfs). These sites are below the irrigation ditches. Another interim IFS is proposed further upstream on Hanehoi Stream to allow withdrawal of stream water by domestic users in the Huelo community (discussed below). The downstream proposed interim IFS for Hanehoi Stream is set at a lower value than the low base flow value of 1.15 cubic feet per second because the stream is an important source of irrigation water for EMI. Compared to two major diversions



on Huelo (Puolua) Stream, EMI is diverting water from Hanehoi Stream at four ditches (Wailoa, New Hamakua, Lowrie, and Haiku Ditch). The interim IFS for Huelo (Puolua) Stream is set at a higher flow to allow water to be available for the downstream surface water users, both in Huelo (Puolua) Stream and below its confluence with Hanehoi Stream.

An interim IFS C is proposed to provide adequate surface water for domestic use of the Huelo community. The site of the proposed interim IFS is just above the pool in which there is an intake (pipe) for domestic users in the Huelo community; this intake is just upstream of Lowrie Ditch. The proposed interim IFS value is the low base flow (BFQ<sub>95</sub>) of 1.15 cfs estimated at an ungaged site, designated station HaneM. This value is used because the ungaged site location is relatively close to that of the proposed interim IFS location upstream of Lowrie Ditch. Assuming this flow represents the above-mentioned conservative estimate of the natural base flow in the stream, then this flow would allow for the improvement of stream biota, as well as provide enough flow for the large number of domestic users of the Huelo community.

In an effort to balance the multiple demands on the stream, staff does not propose return of all the stream water. While it is important to have water downstream of the irrigation ditch diversions for the reasons listed above, it is likewise important to continue allowing the irrigation diversions. The water that flows into the ditch system supports Upcountry Maui's domestic and agricultural uses, large-scale agriculture in central Maui, and provides power to Maui Electric Company. The large-scale agriculture is important to Maui's economy, and diversified agriculture is particularly important to the overall self-sustainability of the island. In practical terms, the result of the proposed interim IFS C is that the upstream diversions at Wailoa Ditch and New Hamakua Ditch could not divert the low flows, but they could divert flows greater than the proposed interim IFS. Considering the importance of Hanehoi Stream to EMI, staff has mitigated this by proposing a lower interim IFS downstream from Haiku Ditch that allows for substantial diversion at Lowrie Ditch and Haiku Ditch.

An interim IFS is not proposed at the stream mouth because of the small number of registered surface water users below the confluence of the streams, and because the stream has a terminal waterfall.

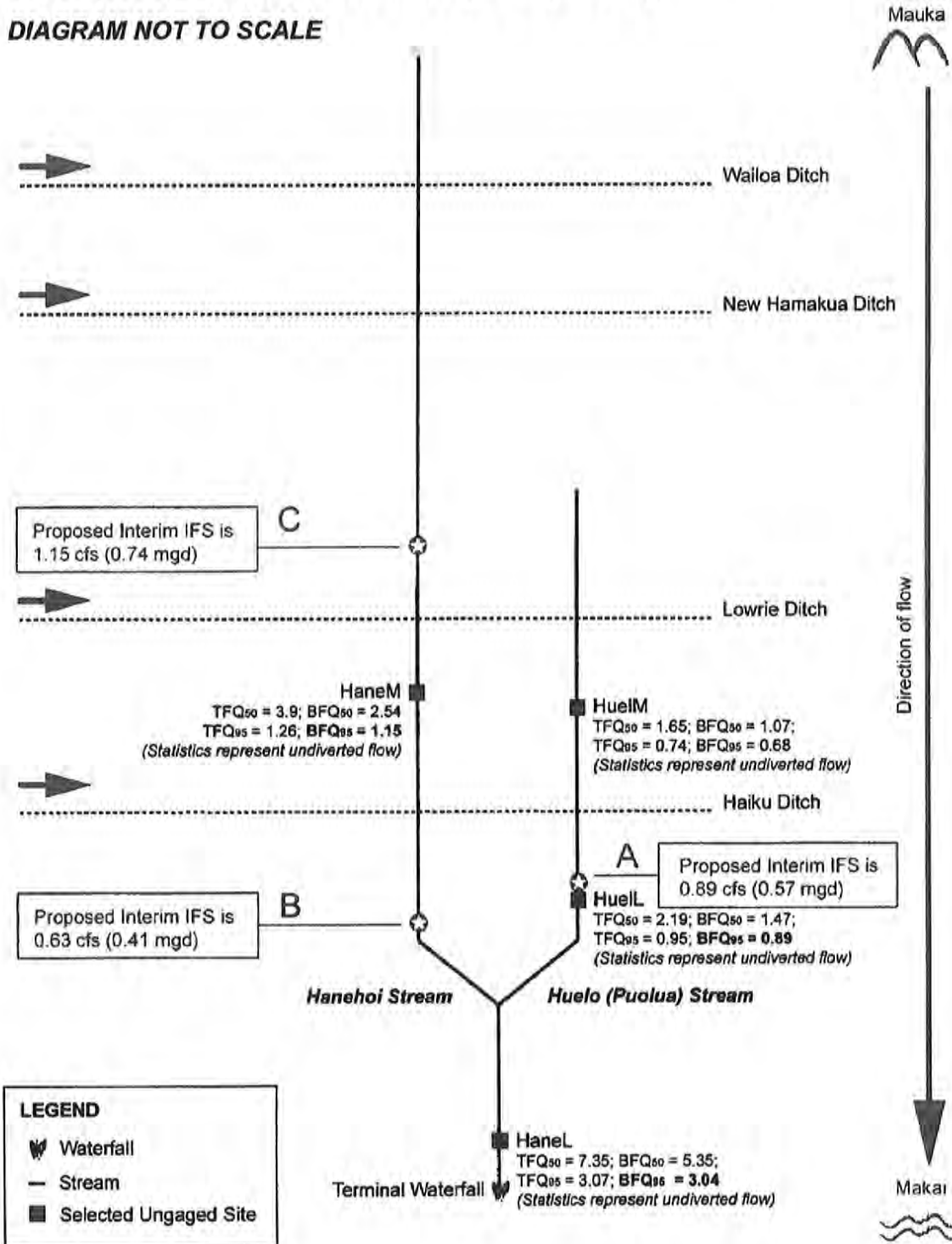
Please note that the proposed interim IFS and the BFQ<sub>95</sub> are averages. Additionally, they are based on regression equations and not directly measured flows, so in addition to natural fluctuations in flow, there is some uncertainty in the data. Therefore, staff proposes an adaptive management strategy that includes periodic review of the proposed interim IFS in providing for both instream and noninstream uses. Specific actions are proposed for consideration under Section E, Proposed Adaptive Management Strategy.

D. Simplified Diagrams.

**HANEHOI Hydrologic Unit: Stream System Schematic Diagram**

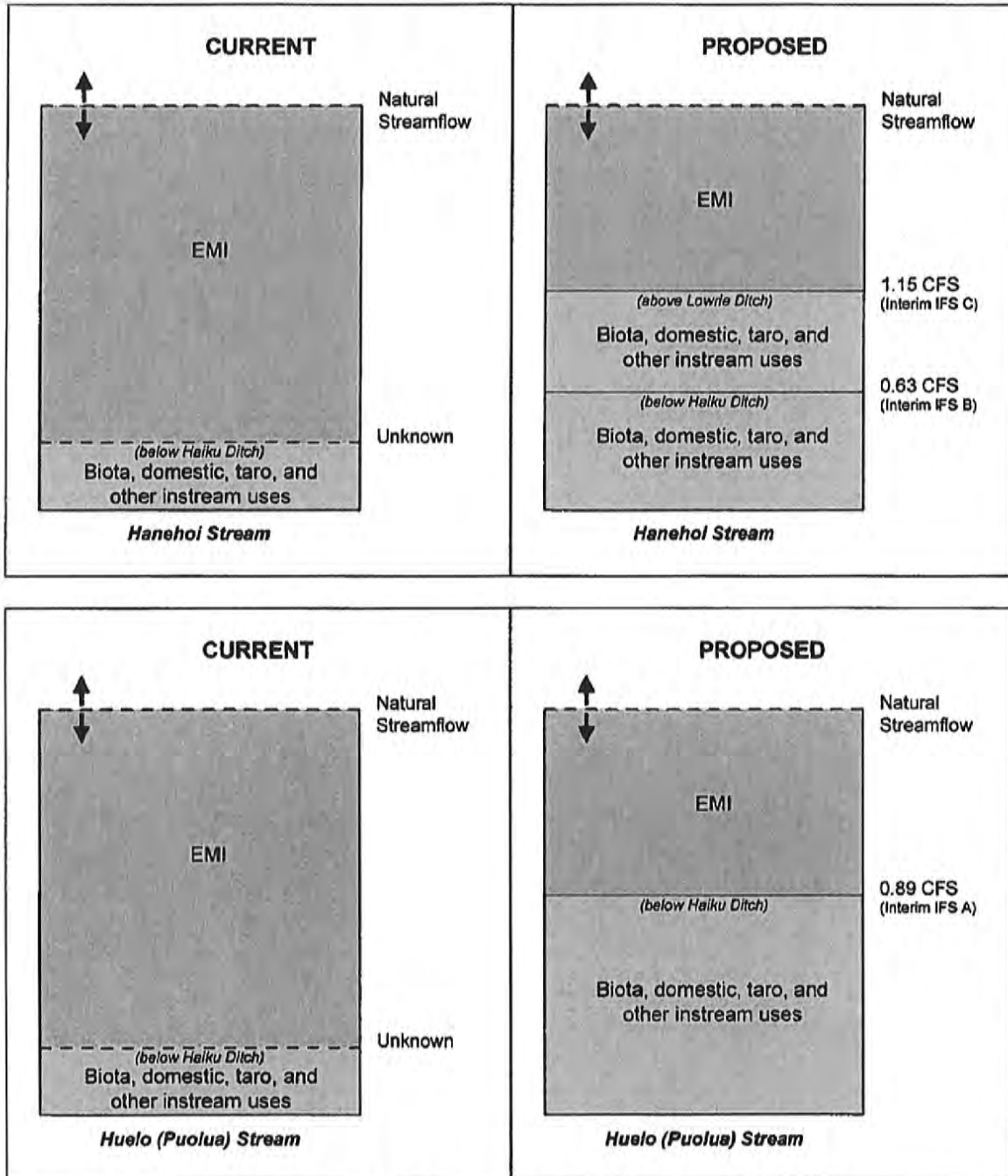
[All flows are in cubic feet per second (cfs) unless other wise noted; mgd = million gallons per day.]

**DIAGRAM NOT TO SCALE**



**HANEHOI Hydrologic Unit: Current and Proposed Interim IFS Diagram**

The diagrams below are intended to provide a general graphical representation of current and proposed interim IFS values for Hanehoi (top) and Huelo (bottom) Streams. Corresponding flows (in cubic feet per second) are identified to the right of each illustration.



**DIAGRAMS NOT TO SCALE**

### E. Proposed Adaptive Management Strategy

Staff proposes one interim IFS for Huelo (Puolua) Stream and two interim IFS for Hanehoi Stream, above its confluence with Huelo (Puolua) Stream. The interim IFS are proposed to allow a majority of the low flow in the stream to pass through the upper diversions and reach the domestic users in the downstream areas. Staff has not proposed an interim IFS below the lowest diversion on Hanehoi Stream.

Staff proposes the following hydrologic unit-specific adaptive management strategies:

- EMI, in coordination with staff, shall consider alteration of the diversions at Haiku Ditch and Lowrie Ditch to allow for the upstream migration of native aquatic species across the diversions.
- Staff may periodically monitor streamflow below the lowest non-EMI diversion to determine whether an interim IFS should be established to protect biological integrity.

Staff proposes the following general adaptive management strategies:

#### IMPLEMENTATION

- Staff shall seek to enforce the provisions of the State Water Code should any unauthorized, non-registered or non-permitted diversions be discovered in the course of its fieldwork. Staff recommends that all owners of unauthorized diversion works structures contact staff to file the necessary applications to seek compliance with all permitting requirements set forth by the Code.
- Staff shall coordinate with EMI to identify and determine appropriate actions with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall coordinate with other registered stream diversion works owners with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall assess the existing condition and status of all EMI diversions, in coordination with EMI and Division of Aquatic Resources (DAR) staff, to determine if any modifications are necessary to improve habitat conditions for stream biota.

#### MONITORING

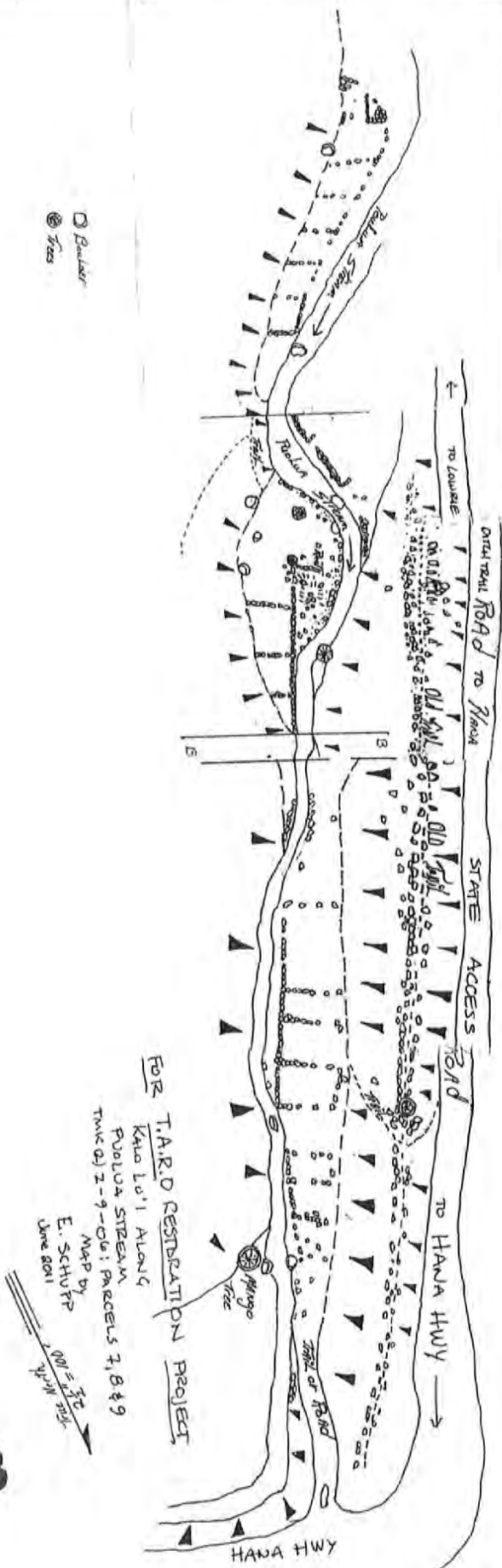
- Staff shall monitor streamflow by taking periodic flow measurements, subject to available funding, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota to post-interim IFS implementation.
- Any party claiming to be negatively impacted as a result of the adopted interim IFS shall monitor and document, in cooperation with staff, the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- Likewise, any party claiming that negative impacts are a direct result of actions (i.e., diverting too much water, violating the interim IFS) caused by another party, shall monitor and document the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.

# Measurements at Site A

<u>Date</u>	<u>Time</u>	<u>Discharge</u>
10/23/08	1404 hr	0.052 cfs (meter)
10/27/08	1403 hr	0.047 cfs (meter)
10/27/08	1430 hr	0.063 cfs (bucket)
10/28/08	1130 hr	0.062 cfs (bucket)
10/28/08	1312 hr	0.055 cfs (meter)
11/19/08	1340 hr	0.244 cfs (meter)
02/10/09	1114 hr	0.380 cfs (meter)
<hr/>		
Interim IFS		0.890 cfs



AREA OF PROPOSED T.A.R.D. PROJECT  
 MAP OF KALD LO'1  
 PUOLUA STREAM



FOR T.A.R.D. RESTORATION PROJECT  
 KALD LO'1 ALONG  
 PUOLUA STREAM  
 TRACTS 2-9-CW; PARCELS 7, 8 & 9

MAP BY  
 E. SCHUTZ  
 June 2011

001 = 1/4"  
 1/4" = 100'

EXHIBIT

11-8



The ancient system of land titles in the Hawaiian Islands was entirely different from that of tribal ownership prevailing in New Zealand, and from the village or communal system of Samoa. But soon a remarkable resemblance to the feudal system that prevailed in Europe during the Middle Ages. Although this system of land tenure was radically changed by the peaceful and beneficent revolution which took place during the reign of Kamehameha III, yet the ancient subdivisions of land remain unchanged to the present day.

#### ANCIENT SUBDIVISIONS OF LAND.

This branch of the subject has been admirably treated by Mr. C. J. Lyne, in the *Slander*, published in 1875. In the first place, each island was divided into several *Moou* or Districts, of which there are six in the island of Hawaii, and the same number in Oahu. There is a district called *Koua* on the lee side, and one called *Koioa* on the windward side of almost every island. On Maui there are some sub-districts called *Ouanika*, of which there are five in the *Haga* District, while *Lanaha* is termed a *Koana*.

The next subdivision of land below the *Moou* is the *Aupuni*, which has been termed the unit of land in the Hawaiian system. Its name, as explained by Mr. Lyne, "is derived from the *Au* or *ahie*, which was erected at the point where the boundary of the land was intersected by the main road *ahiea*, which encircled each of the islands. Upon this spot, at the annual progress of the *ahie* *malahie* (i. e. year gods, *Lono* *maui*, was deposited the tax paid by the land whose boundary it marked, and also an image of a hog, *puha*, carved out of *Maui* wood and stained with red ochre." The typical *Aupuni* is a long narrow strip extending from the sea to the mountain, so that its chief may have his share of all the various products of the *uka* or mountain region, the cultivated land, and the *ka* or sea. On *Maui* the principal lands all radiate from a large rock on the northeast brink of the crater of *Haleakala*, called *Pahoa*. Eight *Aupuni*(s) one in each district of *East Maui*, meet at this rock. The *Aupuni*(s) are extremely unequal. In several districts a few larger *Aupuni*(s), widening as they extend inland, cut off all the smaller lands and take the whole mountain to themselves. The same lands generally monopolized the deep sea fisheries, extending to the smaller *Aupuni*(s) only the *fishery* along their shores, where the water was not more than five feet deep. On *Maui* the lands of *Waialeale* and *Waialeale* appropriated almost the whole of the *stratum* so as to cut off part of the lands in the district of *Kula* from access to the sea. These two *Aupuni*(s) together with *Waialeale* and *Waialeale*, which were independent, belonging to no *Maui*, were called the *Paho*, and have been termed into a district in modern times. While some districts are regularly divided up into *Aupuni*(s) averaging only a quarter of a mile in width and several miles in length, in others we find *Aupuni*(s) like *Honouliuli* in *Oahu*, which contains over forty thousand acres or the four great mountain lands of *Hawaii*, viz. *Kahaloa*, *Kaunaloa*, *Hunua* and *Ki* *Uka*, of which the first mentioned contains 160,000 acres, mostly on the mountains. "The divisions of the lands were to a great extent made on natural lines, following a ridge, the bottom of a ravine or depression, but they were often without these and sometimes of irregular form. Sometimes a stone or rock known to the aborigines and notable from some tradition, or sacred usage, kind of tree, herb or grass, the habitat of a certain kind of bird, sometimes made a division. Certain persons were specially taught and made the repositories of this knowledge, which was carefully delivered from father to son." (*Hawaiian Reports*, Vol. IV, p. 241).

#### SUBDIVISIONS OF THE AUPUNI.

The *Aupuni*(s) were generally but not always subdivided into *Ma*(s), each with its own name and carefully defined boundary. As was recognized by the decision of the Supreme Court in the *Kamehame* case, in 1877, there were two kinds of *Ma*(s) of which the first was a more subdivision of the *Aupuni* for the convenience of the chief holding the same, who received its revenues from his tenants or agents. The other class comprised the "independent" or "free," which were independent of the *Aupuni*, and generally did not pay tribute to its chief. Thus the transfer of the *Aupuni* to a new chief did not affect the ownership of the *Ma* contained within its limits. In some cases these *Ma*(s) abounded the greater part of the *Aupuni* in which they are situated. A well-known case is the *Aupuni* of *Waialeale*, *Hawaii*, of which the independent *Ma*(s) of *Pu* *Uka* and *Waialeale* form about one-seventh. The same is true of the *Aupuni* of *Waialeale* in *Oahu*. In fact, there are many *Ma*(s) that do not seem to be included in any *Aupuni*, as for instance, the *Ma*(s) of *Honouliuli*, which is the name of the locality, but not of an *Aupuni*.

Another peculiarity of the *Ma*, on *Oahu* at least, is that it often consists of several distinct sections, of land in different parts of the *Aupuni*, which are called *Ma*(s), i. e. "paha." Thus many lands in *Maui* have their corresponding portions of sea land and forest in *Waialeale* and *Waialeale* valleys. The same lands of *Waialeale* are found in *Paho* valley, in *Kaui*, and also in the district of *East*, and *Maui*, which consist of eight or ten scattered *Ma*(s) alike, included under one title. Each of these pieces may be spoken of either by its own individual name or by that of the whole *Ma*, which practice is a fruitful source of confusion. The *Ma*(s) were again minutely subdivided, and many of the larger portions had individual names. The portions cultivated exclusively for the chief were called *Ma*(s) or *Ma*(s). In more recent times they were styled *Pahoa* (i. e. *Pahoa*), from the fact that the remnants of the land were formerly clogged by lime to labor by their chief on *Pahoa*. The narrow strips of cultivated city land, separated by ridges of stones, are called *Ma*(s). These ridges or *Ma* frequently serve as boundaries between *Aupuni*(s) and *Ma*(s). The minute subdivision of the land and the great multiplicity of local names bear witness to the detailed explication that must have existed in ancient times.

## EXHIBIT E-9

**Commission Meeting  
DLNR Board Room  
September 24, 2009**



**Staff briefing on the  
Update on the Implementation of  
East Maui Interim Instream Flow Standards**



**State of Hawaii  
Department of Land and Natural Resources  
Commission on Water Resource Management**

**EXHIBIT E-10**



# Summary

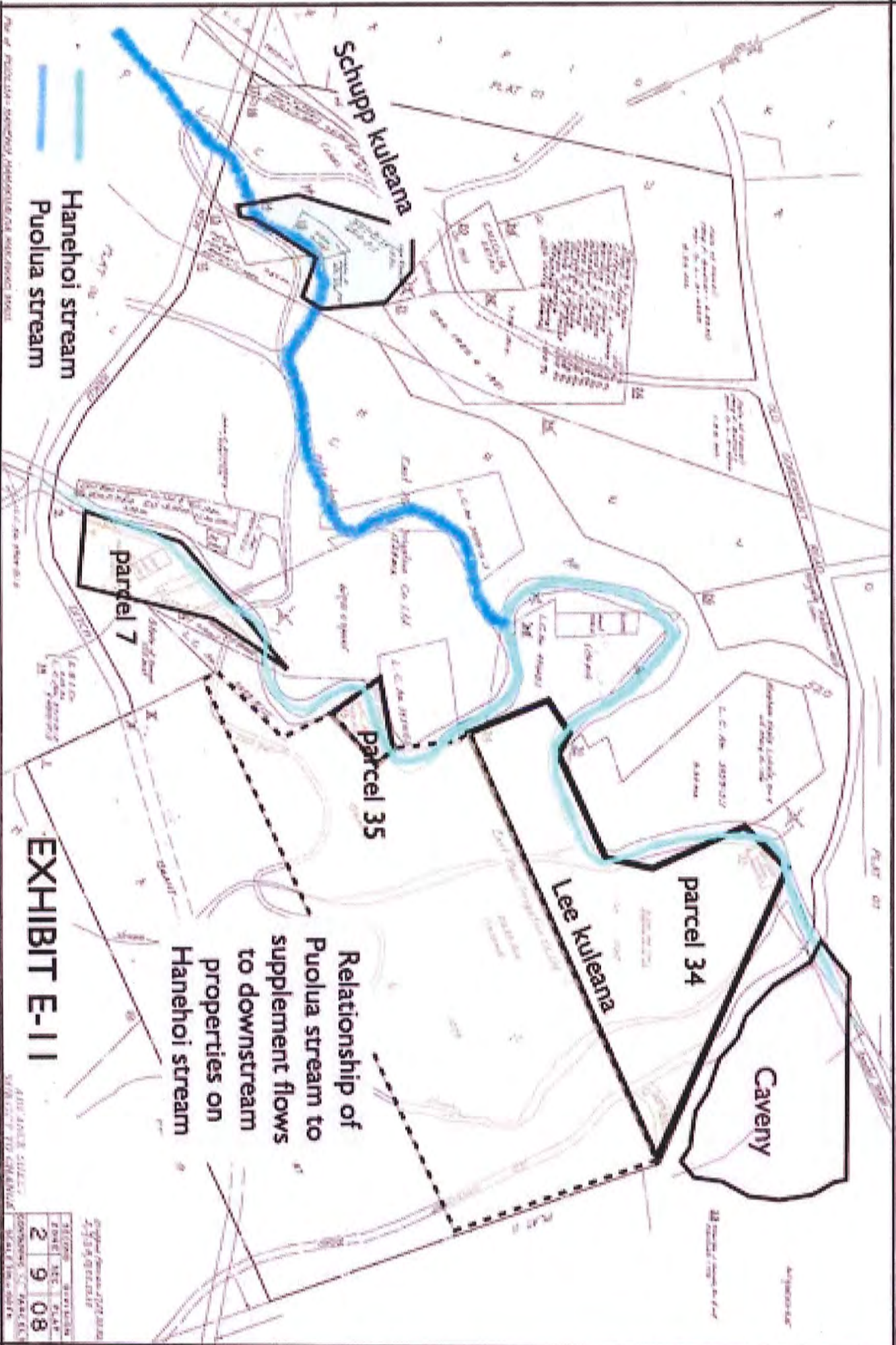
## Interim IFS not achieved

- Site A = 0.38 CFS
- Site B = mostly dry stream
- Site C = 0.35 CFS

## Issues

- Little is known about Hanehoi Stream
- Only 0.24 CFS of flow at Site A with heavy rain in Nov and sluice gate opened
- Access to Site C on private lands (working on ROE)





Hanehoi stream  
Puolu stream

**EXHIBIT E-11**

**Relationship of  
Puolu stream to  
supplement flows  
to downstream  
properties on  
Hanehoi stream**

Original from 2/28/08  
2/28/08

DATE	BY	REVISION
2/9/08	JAMES ANDERSON	ISSUED FOR REVIEW



## **EXHIBIT E-12 "a"**

**Close up of debris choking  
Puolua stream just makai  
of Lowrie Ditch intake.  
Note bypass pipe dumping  
water into pile of debris.  
How can this stream flow?**

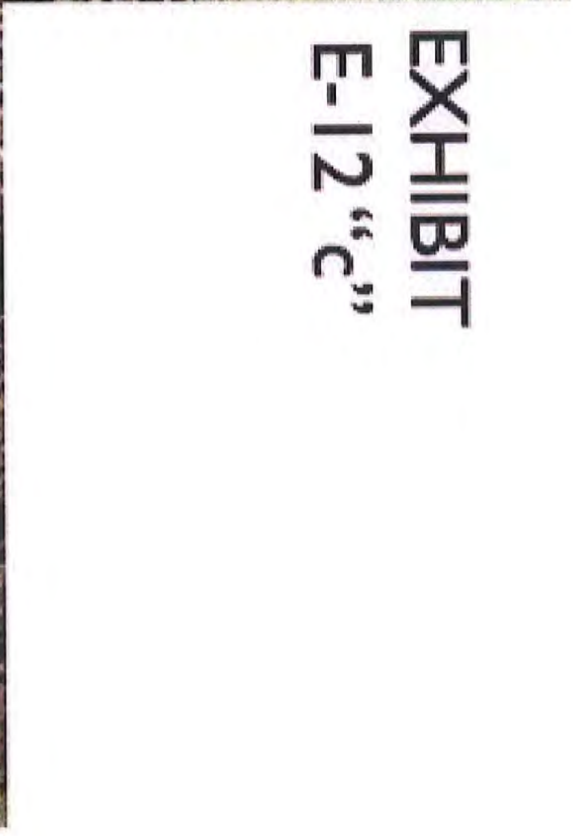


## **EXHIBIT E-12 "b"**



Debris from EMI  
road maintenance  
fills Puolua stream  
bed 4/2011

**EXHIBIT  
E-12 "D"**



**EXHIBIT  
E-12 "C"**





**Puolua Stream-  
Lowrie intake  
April-March 2011**

**STREAM MAUKA  
OF  
INTAKE NOT  
MAINTAINED**

**EXHIBIT  
E-12 “e”**

INTERNAL REVENUE SERVICE  
P. O. BOX 2508  
CINCINNATI, OH 45201

DEPARTMENT OF THE TREASURY

Date: FEB 17 2005

T A R O-TEACHING AND RESTORING  
OPPORTUNITY  
C/O KIMO W NEEDHAM  
WAILUA ST 168  
KEANAE, HI 96708

Employer Identification Number:  
20-1972425  
DLN:  
17053024020045  
Contact Person:  
EVELYN D GRIFFITHS ID# 31432  
Contact Telephone Number:  
(877) 829-5500  
Accounting Period Ending:  
DECEMBER 31  
Public Charity Status:  
170(b)(1)(A)(vi)  
Form 990 Required:  
YES  
Effective Date of Exemption:  
JANUARY 07, 2005  
Contribution Deductibility:  
YES  
Advance Ruling Ending Date:  
DECEMBER 31, 2009

Dear Applicant:

We are pleased to inform you that upon review of your application for tax exempt status we have determined that you are exempt from Federal income tax under section 501(c)(3) of the Internal Revenue Code. Contributions to you are deductible under section 170 of the Code. You are also qualified to receive tax deductible bequests, devises, transfers or gifts under section 2055, 2106 or 2522 of the Code. Because this letter could help resolve any questions regarding your exempt status, you should keep it in your permanent records.

Organizations exempt under section 501(c)(3) of the Code are further classified as either public charities or private foundations. During your advance ruling period, you will be treated as a public charity. Your advance ruling period begins with the effective date of your exemption and ends with advance ruling ending date shown in the heading of the letter.

Shortly before the end of your advance ruling period, we will send you Form 8734, Support Schedule for Advance Ruling Period. You will have 90 days after the end of your advance ruling period to return the completed form. We will then notify you, in writing, about your public charity status.

Please see enclosed Information for Exempt Organizations Under Section 501(c)(3) for some helpful information about your responsibilities as an exempt organization.

Letter 1045 (DO/CG)

**EXHIBIT E-13A**

T A R O-TEACHING AND RESTORING

Sincerely,

A handwritten signature in cursive script, appearing to read "Lois G. Lerner".

Lois G. Lerner  
Director, Exempt Organizations  
Rulings and Agreements

Enclosures: Information for Organizations Exempt Under Section 501(c)(3)  
Form 872-C

## T.A.R.O. – TEACHING AND RESTORING OPPORTUNITY

ATTACHMENT TO IRS FORM 1023  
APPLICATION FOR RECOGNITION OF EXEMPTIONPART II – ACTIVITIES AND OPERATIONAL INFORMATION1. Activities of the Organization

## OUR MISSION

TARO will seek to reestablish the knowledge of the history, culture and importance of Taro to the Hawaiian culture and way of life. The organization will accomplish this goal by establishing a working taro farm as a “living museum,” staffed by volunteers from the community, whereby young people and the community at large can see first hand the process of growing, tending and harvesting the taro. At the same time, participants and visitors can experience the farming techniques and crop care by which their ancestors made their way of living, and upon which they depended for their livelihood and, indeed, their very survival.

It is our hope and dream that the taro culture can be kept alive by giving the community and visitors to the community the chance to see first-hand a working taro farm, and to participate in the growing and care of the taro, so essential to Hawaiian history and culture. Additionally, we will function as a resource to the community regarding the history of taro culture, techniques of growing the various types (dryland vs. wetland, for example) and will provide education and information regarding this important component of Hawaiian culture and history.

It would be a tragedy to see the extinction of taro culture, and it would represent an irretrievable loss to the Hawaiian people and culture. Through the operation of the “living museum” and the provision to the community of information and education regarding taro culture, the organization seeks to preserve the tradition of this vital agricultural crop to the Hawaiians, and perhaps rekindle some of the spirit of the ancestors in the younger generation and the community today.

It is expected that members of the community will donate the land required to establish the taro farm. The land will be irrevocably pledged to charitable use and purposes under the applicable IRS statutes.

The taro is expected to be sold after harvest to provide an annual fundraising event to continue the replanting and growing of additional taro crops. The goal is that future generations will always have a link back to their ancestry and ancient culture through the taro.

CULTURAL AND ECONOMIC HISTORY OF TARO  
IN THE HAWAIIAN ISLANDS

Taro is one of the most important food crops in the Hawaiian Islands. In the days before European contact with the islands it was a major staple for a large percentage of the population. Grown in either irrigated terrace complexes in valleys with swift flowing rivers, or on wet

EXHIBIT E-13B



hillsides on the windward coasts of Hawaii, it was one of the markers of the Hawaiian cultural landscape. Taro was so important that one of Hawaii's queens, Emma, started out to write a monograph on its culture and its importance to the Hawaiian people.

Today, Taro itself is in danger of being replaced in Hawaii by the growers of American Samoa and other places in the South Pacific. The cost of competition for Hawaiian growers becomes greater as land is alienated for development and water comes into short supply. A third factor, but one that is most important, is the willingness of farmers to put in the substantial labor costs that the culture of taro demands.

The poi that we pick up so easily in the local supermarket is the end product of a system of tillage, hard planting, and hand harvesting that is one of the most labor intensive of any cash crop in the world. It is also the end product of close to fifteen hundred years of adaptation of a particular plant species, *Colocasia esculenta*, to an environment that was completely alien to it when it was first introduced by Hawaiian settlers in the islands sometime between four and five hundred years A.D.

How did this crop, a necessity for the children of Hawaii as they grow and an important social crop today for lu'au, birthday parties, or just an afternoon picnic in Ala Moana Park, become so important for Hawai'i? Archaeologists who study the beginnings of Hawaiian settlement do not necessarily agree on the ways that taro became important in the islands. They do agree, however, that it must have been among the first crops that were introduced to the Hawaiian Islands. And when Captain Cook first set foot on the shores of the Hawaiian Islands, *taro was king*.

Taro is a hearty plant. The cuttings from a mature taro can be maintained for months if they are mulched and watered. So taro was the natural crop on which to base an economy on the northern islands. And the Polynesians who settled Hawaii, always looking to make the best of a good deal, did their utmost to make the crop work.

The question of how taro became as important as it did in the Hawaiian economy is one that has never successfully been answered. Some of the important factors, though, have been explored by scientists from a number of institutions.

At Halawa Valley, for instance, where the most intensive archaeological research has been that regarding taro agriculture, it has been argued that taro became important as a result of an attempt by the Hawaiians to maintain the status quo of their old economy. Scientists have suggested that Hawaiians were only trying to maintain the quality of life that they had become used to when they first arrived in the islands. In order to do this they burned a certain amount of the forest for planting. After they had planted on this limited amount of land, some 85 acres, they found it necessary to reduce the number of years that they left the land fallow after planting. This short fallow period depleted the fertility of the land, and made it necessary to put more time into cutting brush and burning it.

After a while it was realized that irrigated agriculture, already minimally developed in small patches could be used to grow single crops of irrigated taro. The yields could be made greater within these systems and one did not have to worry about the land becoming depleted when it was used over and over again, as long as the necessary nutrients were replenished. The small,

irrigated garden patches of little more than an acre or so were ultimately expanded into massive, complex hydrological systems covering tens of acres in extent.

The history of the taro economy in the Hawaiian Islands is a fascinating one, but there are fears that the days of Hawaiian taro are limited. The State Department of Planning and Economic Development presently foresee a bleak future for Hawaiian taro agriculture. Water, tapped from mountain watersheds for tourist development, the alienation of land from agriculture to other forms of land use, and the sheer labor that goes into taro production, combine to make taro a crop with minimal return for the sweat put into its production.

But the recognition of the importance of Hawaiian taro remains with the Hawaiian people. In agricultural projects that are reclaiming former taro lands above Wai'anae on O'ahu, or at Wainiha Valley on Kaua'i where several families are fighting to keep their loi (taro patch) operating, or at Hanalei where the U.S. Fish and Wildlife Service is trying to make inexpensive water available for the remaining taro farmers, *taro is still king*. Keeping the loi repaired, dried, planted, irrigated and producing requires a knowledge that has fifteen hundred years of Hawaiian tradition behind it, and a respect for the original uses of the land that has not died through the last two centuries of change in the Hawaiian Islands.

## 2. Sources of Financial Support / Fundraising Program

The organization's primary resource for funding is expected to consist of the donation of the land necessary to establish the taro farm, grants from foundations and other philanthropic entities, as well as contributions from civic, community and individual sources who share our vision of keeping taro culture alive and preserving this vital link to our ancestry and cultural traditions.

In addition, the organization will offer the taro crop grown on the donated land for sale as a fundraiser to fund the next year's planting, tending and harvesting of the taro. The organization does not have any concrete plans for specific fundraising events in the near future, but will initially rely on word of mouth and publicity in local newspapers regarding the organization and its mission to generate publicity and financial support for our project.

The project will be staffed initially by volunteers who share our vision of keeping the taro culture alive. While it is possible that, at some point in the future, there may be paid staff, at this time we do not foresee providing salaries to anyone associated with the project or the organization.

File Copy

0214



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

54 High Street, Room 101  
Wailuku, Hawaii 96793  
PHONE: (808) 984-8103  
FAX: (808) 984-8111  
March 24, 2011

**RIGHT-OF-ENTRY PERMIT**

Ms. Lucienne DeNaie, Project Manager  
c/o Maui Tomorrow Foundation, Inc.  
55 N. Church Street, Suite A5  
Wailuku, HI 96793

Dear Ms. DeNaie,

SUBJECT: Right-of-Entry for Access to Government Lands for Watershed Maintenance Activities, Mokuapapa – Huelo, Hamakualoa, Maui, Tax Map Key (2) 2-9-006:008 por.

It is our understanding that Maui Tomorrow volunteers and staff are requesting a Right-of-Entry for a parcel of government lands situate at TMK 2-9-006:008 por. located along Puolua stream in the Huelo region of Maui. The Right-of-Entry permit will extend for thirty (30) days throughout the month of April, 2011.

The purpose of the access is to help maintain the watershed. Activities will include clearing invasive shrubs from the access trail, repair of barbed wire fences and removal of alien saplings and dead branches and fallen trees from the banks of Puolua stream. Volunteers will be using hand tools such as loppers. One trained volunteer will be using a chainsaw for larger branches during one of the later accesses. A total of 3 to 6 individuals will be involved in the various accesses.

This right-of-entry for Maui Tomorrow (MT) and its contractors are subject to the following terms and conditions:

1. This right-of-entry will be effective Friday April 1, 2011 and will expire at sunset on Saturday, April 30, 2011; unless extended for good cause.
2. MT and its contractors shall indemnify, defend and hold harmless the State of Hawaii, Department of Land and Natural Resources from and against any loss, liability, claim or demand for property damage, personal injury, and death arising out of any act or

**EXHIBIT E-14**

7. **MT** and its contractors in the exercise of this right-of-entry shall use appropriate precautions and measures to minimize inconveniences to surrounding residents, landowners, and the public in general.
8. **MT** and its contractors shall not store any personal belongings at the subject property during the effective period of this right-of-entry.
9. In the event any anticipated sites or remains such as bone or charcoal deposits, human burials, rock or coral alignments, paving or walls are encountered, **MT** and its contractors in the exercise of this right-of-entry shall stop work and contact the State Historic Preservation Division in Kapolei at (808) 692-8015 immediately.
10. The Department of Land and Natural Resources reserves the right to impose additional terms and conditions, if deemed necessary while this right-of-entry is in force.

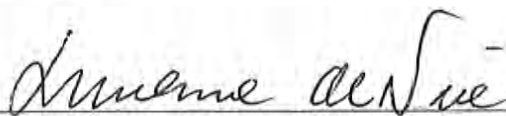
Should you accept the above terms and conditions please acknowledge and return a signed copy of this letter with a copy of your liability insurance coverage to the Maui District Land Office. If you have questions, please feel free to call my office at 984-8103. Mahalo.

Aloha,



Daniel Ornellas  
District Land Agent

ACCEPT:

  
Ms. Lucienne DeNaie, Project Manager  
Maui Tomorrow Foundation, Inc.

3/20/11  
Date



# CERTIFICATE OF LIABILITY INSURANCE

OP ID JA

DATE (MM/DD/YYYY)

01/24/11

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b>  Insurance Associates, Inc. 800 Bethel Street, Suite 200 Honolulu HI 96813-4305 Phone: 808-538-6938 Fax: 808-531-8361	<b>CONTACT NAME:</b> PHONE (A/C, No, Ext): _____ FAX (A/C, No): _____ E-MAIL ADDRESS: _____ PRODUCER CUSTOMER ID #: <b>MAUIT-5</b>														
	<table border="1"> <thead> <tr> <th>INSURER(S) AFFORDING COVERAGE</th> <th>NAIC #</th> </tr> </thead> <tbody> <tr> <td>INSURER A: Northfield Insurance Company</td> <td></td> </tr> <tr> <td>INSURER B:</td> <td></td> </tr> <tr> <td>INSURER C:</td> <td></td> </tr> <tr> <td>INSURER D:</td> <td></td> </tr> <tr> <td>INSURER E:</td> <td></td> </tr> <tr> <td>INSURER F:</td> <td></td> </tr> </tbody> </table>		INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A: Northfield Insurance Company		INSURER B:		INSURER C:		INSURER D:		INSURER E:		INSURER F:
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INSURER C:															
INSURER D:															
INSURER E:															
INSURER F:															
<b>INSURED</b>  Maui Tomorrow Foundation Inc. 55 N. Church Street #A-105 Wailuku HI 96793															

**COVERAGES**

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR	WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY			WS088959	01/27/11	01/27/12	EACH OCCURRENCE \$ 1,000,000
	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC	X					DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 100,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ Excluded -GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMPI/OP AGG \$ 2,000,000
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$ \$
	UMBRELLA LIAB <input type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DEDUCTIBLE RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$ \$ \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below		Y/N N/A				WC STATUTORY LIMITS OTHER E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)  
 For right of entry for a parcel of State land (TMK 2-9-06:08) for watershed maintenance activity - Certificate Holder is Additional Insured for thier interest

<b>CERTIFICATE HOLDER</b>  STATE05 State of Hawaii - Dept of Land and Natural Resources Oahu District Office 1151 Punchbowl St, Rm 220 Honolulu HI 96813	<b>CANCELLATION</b>  SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.  AUTHORIZED REPRESENTATIVE 
--	--

Puolua stream

Proposed T.A.R.O.  
restoration project  
on Puolua stream

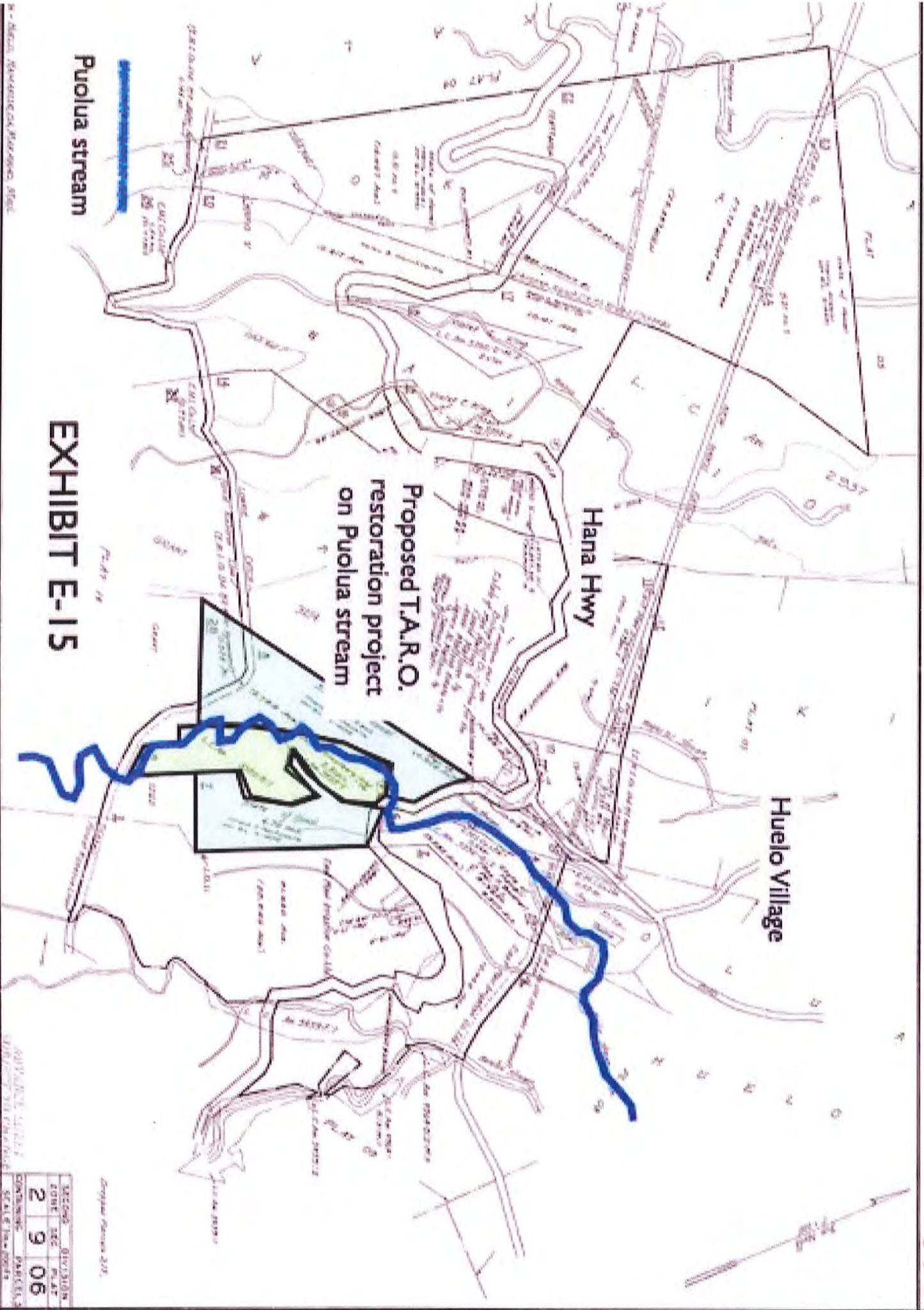
Hana Hwy

Huelo Village

EXHIBIT E-15

English Version 2/07

SECTION	DIVISION
2	9 06
CONTAINS PARCELS	
SCALE: 1" = 100'	



**APPLICATION AND QUALIFICATION QUESTIONNAIRE**

(Non-Profit)

Write answers in the spaces provided. Attach additional sheets as necessary, clearly indicating the applicable section number.

Part I: General Information

1. Applicant's legal name: T.A.R.O-"Teaching And Restoring Opportunity"
2. Applicant's full mailing address:  
HC 1 Box 168, Haiku, Hawaii, 96708
3. Name of contact person: Kimo W. Needham  
Contact person Phone No.: 808-250-6098 Fax No.: \_\_\_\_\_
4. Applicant is interested in the following parcel:  
Tax Map Key No.: 2-9-06 (07 & 08) Location: Huelo Area  
If Applicant is current lessee: General Lease No.: None
5. When was Applicant incorporated? January 07, 2005
6. Attach the following:
  - A. Articles of Incorporation
  - B. Bylaws
  - C. List of the non-profit agency's Board of Directors
  - D. IRS 501(c)(3) or (c)(1) status determination
  - E. Tax clearances from State of Hawaii and respective county Real Property Tax Office.
  - F. Audited financial statements for the last three years. If not audited, explain why.  
If Applicant is a new start-up, attach projected capital and operating budgets.
  - G. Any program material which describes eligibility requirements or other requirements to receive services

Part II: Qualification

7. Is Applicant registered to do business in Hawaii? Yes/No  Yes  No
8. Has Applicant received tax exempt status from the Internal Revenue Service? Yes/No  Yes  No
9. Is Applicant licensed or accredited in accordance with federal, State or county statutes, rules, ordinances, to conduct the proposed activities? Yes/No  Yes  No

List all such licenses and accreditations required: None is required at this time.

10. Is Applicant in default or otherwise not in good standing with any State department (e.g. POS agency, DCCA, DLNR, etc.)? Yes/No  Yes  No

If yes, explain:

11. Has Applicant had a State of Hawaii lease, permit, license, easement or sale in fee cancelled within the last five years? If yes, list: Yes/No

<u>Doc. No.</u>	<u>Type of Agreement</u>	<u>Term of Agreement</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

12. Does Applicant have any policies which discriminate against anyone on the basis of race, creed, color, national origin, sex or physical handicap? Yes/No

If yes, explain:

\_\_\_\_\_

\_\_\_\_\_

13. Has Applicant received funding from a federal, State, or county government agency, the Aloha United Way, and/or a major private foundation within the last three years? Please list all such contracts below: Yes/No

<u>Agency</u>	<u>Contract Term</u>	<u>Contract Amount</u>
_____	_____	\$ _____
_____	_____	\$ _____
_____	_____	\$ _____
_____	_____	\$ _____
_____	_____	\$ _____
_____	_____	\$ _____
_____	_____	\$ _____
_____	_____	\$ _____

14. If Applicant has not received funding from a federal, State or county government agency, the Aloha United Way and/or a major private foundation during the past three years, describe Applicant's qualifications to effectively perform the proposed services, including but not limited to, grants or subsidies received from non-major, private fundors and/or staff or Board members who possess significant experience in Applicant's service field.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Part III: Program Activities and Persons to be Served

15. What activities will be conducted on the premises to be leased?

**Invasive Plant Species Removal**

**Fencing, Planting, Landscaping, Maintenance and Education.**

16. What are the specific objectives of these activities?

**Endemic Plant Restoration and Preservation.**

17. Describe the community need for and the public benefit derived from these activities.

**The community and the Island in general will benefit from the restoring, preserving, and education of the native**

**forest habitats. Along with restoring the community's watershed capacity and resource accessibility.**

18. Describe the targeted population for these activities by: 1) age group, 2) gender, 3) ethnic background, 4) income level, 5) geographic location of residence, 6) special needs/disability, and 7) other applicable characteristic(s).

**All Ages, Genders and Ethnic Populations**

19. Describe all eligibility requirements of clients to participate in the activities, e.g. age, income level, ethnic background, income level, disability, etc.

**All will be welcome to participate and volunteer.**

20. Do you require membership to participate in these activities?  
If yes, list the requirements of becoming and remaining a member:

Yes/No

21. How many unduplicated persons will engage in the activities annually?

<u>Activity</u>	<u>Persons Per Year</u>
<u>Invasive Plant Removal</u>	<u>10 - 40 (plus)</u>
<u>Endemic Replanting</u>	<u>Same as Above</u>
<u>Fencing, Landscaping and Maintenance</u>	<u>Same as Above</u>

22. Is State funding made available for the activities to be conducted on the leased premises? Yes  No

If yes, by which State agency: \_\_\_\_\_

23. List all activities to be conducted on the leased premises which require payment of excise taxes, e.g. subleasing, sale of products or services. Include an estimate of annual gross revenues from each activity.

None  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Development of the Land

24. Describe the proposed site development plan for the property, indicating the location and size of buildings, parking areas, landscaped areas and related uses. Attach sketch of plan if available.

Sketch attached of Landscape Plans-"Basic Google Map Outline"

No building or parking areas proposed at this time.  
\_\_\_\_\_  
\_\_\_\_\_

25. What improvements to the land do you intend to make and at what cost?

<u>Restore Old Service Road</u>	<u>\$ 0.00 (Volunteer and Donation of Labor)</u>
<u>Fencing and Accessories for Fencing</u>	<u>\$ 8,000.00</u>
<u>Restructuring of Old Loi's and Waterways</u>	<u>\$ 0.00 (Volunteer and Donation of Labor)</u>
<u>Approximate Cost:</u>	<u>\$ 8,000.00</u>

26. How will the improvements be funded?

Grants and Public Donations

Labor will be Voluntary and Donated  
\_\_\_\_\_  
\_\_\_\_\_

27. Describe all environmental, land use and other permitting requirements which must be met to develop the land as proposed.

Not anticipated that permits would be required to plant on A.G classified land.

28. Will you be subleasing any portion of the property? If yes, describe the sublease uses:

No

Part V: Notarized Certification

I/We hereby certify that the statements and information contained in this Application and Questionnaire, including all attachments, are true and accurate to the best of my/our knowledge and understand that if any statements are shown to be false or misrepresented, I/we may be disqualified from receiving a lease or my/our lease may be canceled.

T.A.R.O. "Teaching And Restoring Opportunity"

Applicant Name

Applicant Name

By: Kimo W. Needham

By:

Its: President

Its:

Date:      /      / 2011

Subscribed and sworn to before me this  
     day of     , 20    

Notary Public

County of:     

State of:     

My commission expires:

## T.A.R.O - "Teaching And Restoring Opportunity"

### Proposed Estimated: Capital and Operating Budget

<b>Income</b>	<b>2011</b>	<b>2012</b>
1. Grants	\$ 5,000.00	\$ 5,000.00
2. Contributions	\$ 2,500.00	\$ 2,500.00
3. Fundraisers	\$ 500.00	\$ 500.00
<b>Total Income:</b>	<b>\$ 8,000.00</b>	<b>\$ 8,000.00</b>
<b>Expenses</b>	<b>2011</b>	<b>2012</b>
1. Fund Expenses	\$ 500.00	\$ 500.00
2. Insurance	\$ 500.00	\$ 500.00
3. Professional Labor	\$ 2,500.00	\$ 2,500.00
4. Fencing and Miscellaneous Supplies	\$ 4,000.00	\$ 4,000.00
<b>Total Expenses:</b>	<b>\$ 7,500.00</b>	<b>\$ 7,500.00</b>
<b>Net Profit:</b>	<b>\$ 500.00</b>	<b>\$ 500.00</b>

### Expense Cost Breakdown with Inflation

Estimated: 4,200 feet of fencing

<u>Quantity</u>	<u>Description</u>	<u>2011-Cost</u>	<u>2012-Cost</u>
11	12 Gauge Fencing	\$ 1,520.00	\$ 1,520.00
110	Metal Pipe Post	\$ 580.00	\$ 580.00
320	Metal Stake Post	\$ 1,380.00	\$ 1,380.00
3	Barbwire Roll	\$ 120.00	\$ 120.00
2	Metal Access Gates	\$ 250.00	\$ 250.00
	Misc. Accessories; nails, clips, ect.	\$ 150.00	\$ 150.00
<b>Total Cost of Fencing and Supplies:</b>		<b>\$ 4,000.00</b>	<b>\$ 4,000.00</b>
	Professional labor:	\$ 2,500.00	\$ 2,500.00
	Fund and Insurance Expenses:	\$ 1,000.00	\$ 1,000.00
<b><u>Total Estimated Cost for the Project Site:</u></b>		<b>\$ 7,500.00</b>	<b>\$ 7,500.00</b>
<b><u>Annual Project Cost:</u></b>			<b>\$ 15,000.00</b>
<b>Total Net Profit:</b>			<b>\$ 1,000.00</b>

PALI

Christmasberry Tree,  
At Edge of Pali

43'

28'

christmasberry trees

christmas berry  
trees

24'

30'

strawberry  
guava  
trees

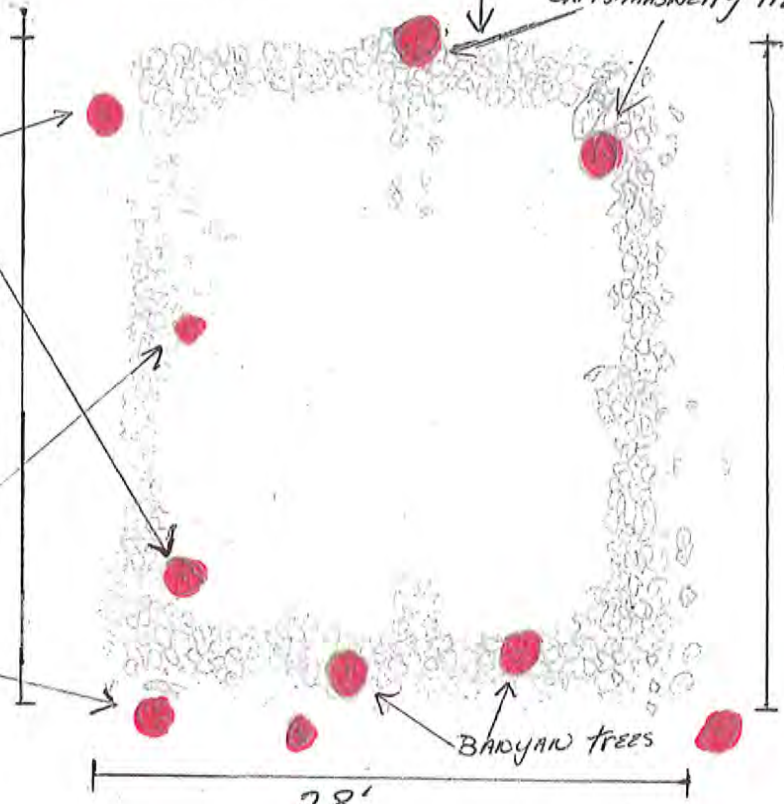
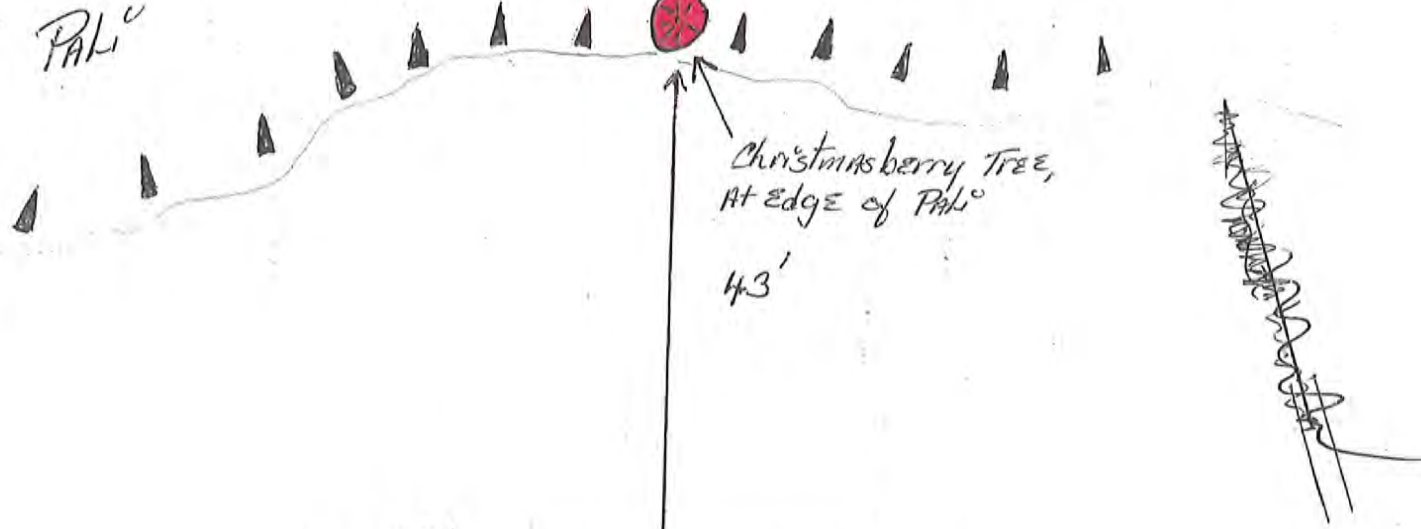
BANYAN trees

28'

MAP by E. Schupp 6-2011

EXHIBIT E-17

North



E-18  
"I"



Remains of 10' walls - same area, c. 2001

E-18  
"J"



Certified to be a true and correct copy of the instrument recorded in the Office of Conveyances of the State of Hawaii

MAY 04 2001

document # 2001-00000000

OFFICE OF THE REGISTRAR OF LANDS AND TERRITORIES OF HAWAII

*J. M. Wilcox*

LAND COURT SYSTEM

REGULAR SYSTEM

After Recordation, Return By Mail (XXX) Pickup ( ) To:

Neola Caveny  
42 Pua Ole Street  
Paia, HI 96779



Escrow No. 10-104762-LP  
Total Pgs. 9

TMK No. (2) 2-9-11-14

WARRANTY DEED

THIS DEED, made this 27 day of April, 2001, by CHARLES EDWARD CHIN and ASHA BEEPETH, husband and wife, whose address is 5409 N. La Presa Avenue, San Gabriel, California 91776, hereinafter called the "Grantor", in favor of NEOLA CAVENY, single, whose address is 42 Pua Ole Street, Paia, Hawaii 96779, hereinafter called the "Grantee",

W I T N E S S E T H :

That in consideration of the sum of ONE DOLLAR (\$1.00) and in conjunction with the Grantor's exchange of property pursuant to Section 1031 of the Internal Revenue Code of the United States of America, as amended, the Grantor does hereby grant, bargain, sell and convey unto the Grantee, as Tenant in Severalty, all of the Grantor's right, title and interest in and to that certain property described in Exhibit "A" attached hereto and made a part hereof.

And the reversions, remainders, rents, issues and profits thereof and all the estate, right, title, and interest of the Grantor, both at law and in equity, therein and thereto;

EXHIBIT E-19

TO HAVE AND TO HOLD the same, together with all buildings, improvements, rights, easements, privileges and appurtenances thereon and thereto belonging or appertaining or held and enjoyed in connection therewith unto the Grantee, in fee simple.

AND, in consideration of the premises, the Grantor does hereby covenant with the Grantee that the Grantor is seized of the property herein described in fee simple; that said property is free and clear of and from all liens and encumbrances, except for the lien of real property taxes not yet by law required to be paid, and except as may be specifically set forth herein; that the Grantor has good right to sell and convey said property, as aforesaid; and, that the Grantor will WARRANT AND DEFEND the same unto the Grantee against the lawful claims and demands of all persons, except as aforesaid.

The rights and obligations of the Grantor and the Grantee shall be binding upon and inure to the benefit of their respective estates, heirs, personal representatives, successors, successors in trust and assigns. All obligations undertaken by two or more persons shall be deemed to be joint and several unless a contrary intention shall be clearly expressed elsewhere herein. The conveyance herein set forth and the warranties of the Grantor concerning the same are expressly declared to be in favor of the Grantee and the Grantee's heirs, personal representatives, successors and assigns.

The terms "Grantor" and "Grantee", as and when used herein, or any pronouns used in place thereof, shall mean and include the masculine or feminine, the singular or plural number, individuals, partnerships, trustees or corporations, and their and each of their respective successors, heirs, personal representatives and assigns, according to the context thereof.

IN WITNESS WHEREOF, the undersigned have executed these presents on the day and year first above written.

  
CHARLES EDWARD CHIN

"Grantor"



Asha BEEPATH  
ASHA BEEPATH

"Grantor"

STATE OF CALIFORNIA )  
COUNTY OF Los Angeles ) SS.

On April 27, 2001, before me personally appeared CHARLES EDWARD CHIN, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Notary Public (Signature) [Signature]

Notary Public (Print/Type) MICHAEL CHU, NOTARY PUBLIC

My commission expires: Sept 13 2004

STATE OF CALIFORNIA )  
COUNTY OF Los Angeles ) SS.



On April 27, 2001, before me personally appeared ASHA BEEPATH, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Notary Public (Signature) [Signature]

Notary Public (Print/Type) MICHAEL CHU, NOTARY PUBLIC

My commission expires: Sept 13 2004

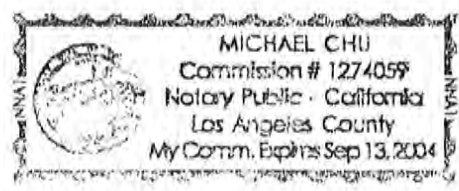


EXHIBIT "A"

All of that certain parcel of land known as Lot 1 of Hanehoi Gardens, a subdivision of Parcel 14 of Tax Map Key (2), 2-9-11 on file with the Department of Public Works and Waste Management (LUCA File No. 2.2234) being portion of Grant 2784 to Kaiewe, situate at Hanehoi, Hamakualoa, Island and County of Maui, State of Hawaii and more particularly described as follows:

Beginning at a 1/2 inch pipe at the Southwest corner of the Lot and at the East side of Government Road, the coordinates of said point of beginning being North 291.32 feet, East 19,686.31 feet, referred to Government Survey Triangulation Station "KAPUAI" and running by azimuths measured clockwise from true South (meridian of said "KAPUAI"); thence,

1. Along Road Widening Lot 1 on a curve to the left with a radius of 103.00 feet and a central angle of 20° 24', the chord azimuth and distance being  
148° 04' 36.48 feet to a 1/2 inch pipe; thence,
2. 137° 52' 47.11 feet along the same to a 1/2 inch pipe; thence,
3. Along the same on a curve to the right with a radius of 131.00 feet and a central angle of 33° 12', the chord azimuth and distance being  
154° 28' 74.85 feet to a 1/2 inch pipe; thence,
4. 171° 04' 19.93 feet along the same to a 1/2 inch pipe; thence,
5. Along the same on a curve to the right with a radius of 970.00 feet and a central angle of 3° 46', the chord azimuth and distance being  
172° 57' 63.76 feet to a 1/2 inch pipe; thence,
6. Along the same on a curve to the left with a radius of 56.43 feet and a central angle of 20° 47', the chord azimuth and distance being  
164° 26' 30" 20.36 feet to a 1/2 inch pipe; thence,
7. 154° 03' 27.07 feet along the same to a 1/2 inch pipe; thence,

8. 259° 31' 40" 496.39 feet along Tax Map Key (2) 2-9-07:04 (EMI Co., Ltd.) to a 1/2 inch pipe; thence,
9. 25° 21' 207.45 feet along Lot 2 of this subdivision to a 1/2 inch pipe; thence,
10. 61° 03' 89.03 feet along the same to a 1/2 inch pipe; thence,
11. 33° 50' 90.43 feet along the same to a 1/2 inch pipe; thence,
12. 74° 18' 165.85 feet along the same to the point of beginning and containing an area of 2.219 acres, more or less, as per survey of Edgardo V. Valera, Licensed Professional Land Surveyor No. 5076 with Valera, Inc., dated April 1, 1998.

TOGETHER WITH an undivided 1/3rd interest in and to Lot 4 for roadway and utility purposes until such time as Lot 4 is conveyed to the County of Maui, described as follows:

All of that certain parcel of land known as Lot 4 (Road Widening Lot) of Hanehoi Gardens, a subdivision of Parcel 14 of Tax Map Key (2) 2-9-11 on file with the Department of Public Works and Waste Management (LUCA File No. 2.2234) being portion of Grant 2784 to Kaiewe, situate at Hanehoi, Hamakualoa, Island and County of Maui, State of Hawaii and more particularly described as follows:

Beginning at a 1/2 inch pipe at the Southernmost corner of the Lot and along Grant 1080 to Puha, the coordinates of said point of beginning being North 224.32 feet, East 19,689.50 feet, referred to Government Survey Triangulation Station "KAPUAI" and running by azimuths measured clockwise from true South (meridian of said "KAPUAI"); thence,

1. 137° 52' 5.93 feet along Grant 1080 to Puha to a point; thence,
2. Along the Old Government Road on a curve to the left with a radius of 98.00 feet, and a central angle of 56° 35' 46", the chord azimuth and distance being  
166° 09' 53" 92.92 feet to a point; thence,
3. 137° 52' 47.11 feet along the same to a point;

thence,

4. Along the same on a curve to the right with a radius of 136.00 feet and a central angle of  $33^{\circ} 12'$ , the chord azimuth and distance being  
154° 28' 77.71 feet to a point; thence,
5. 171° 04' 19.93 feet along the same to a point; thence,
6. Along the same on a curve to the right with a radius of 975.00 feet and a central angle of  $3^{\circ} 46'$ , the chord azimuth and distance being  
172° 57' 64.09 feet to a point; thence,
7. Along the same on a curve to the left with a radius of 51.43 feet and a central angle of  $20^{\circ} 47'$ , the chord azimuth and distance being  
164° 26' 30" 18.55 feet to a point; thence,
8. 154° 03' 28.46 feet along the same to a point; thence,
9. 259° 31' 40" 5.19 feet along Tax Map Key (2) 3-9-07:04 (EMI Co., Ltd.) to a 1/2 inch pipe; thence,
10. 334° 03' 27.07 feet along Lot 1 of this subdivision to a 1/2 inch pipe; thence,
11. Along the same on a curve to the right with a radius of 56.43 feet and a central angle of  $20^{\circ} 47'$ , the chord azimuth and distance being  
344° 26' 30" 20.36 feet to a 1/2 inch pipe; thence,
12. Along the same on a curve to the left with a radius of 970.00 feet and a central angle of  $3^{\circ} 46'$ , the chord azimuth and distance being  
352° 57' 63.76 feet to a 1/2 inch pipe; thence,
13. 351° 04' 19.93 feet along the same to a 1/2 inch pipe; thence,

14. Along the same on a curve to the left with a radius of 131.00 feet and a central angle of 33° 12', the chord azimuth and distance being
- 334° 28' 74.85 feet to a 1/2 inch pipe; thence,
15. 317° 52' 47.11 feet along the same to a 1/2 inch pipe; thence,
16. Along the same on a curve to the right with a radius of 103.00 feet and a central angle of 20° 24', the chord azimuth and distance being
- 328° 04' 36.48 feet to the point; thence,
17. Along Lot 2 of this subdivision on a curve to the right with a radius of 103.00 feet and a central angle of 16° 45', the chord azimuth and distance being
- 346° 38' 30" 30.00 feet to a 1/2 inch pipe; thence,
18. Along Lot 3 of this subdivision on a curve to the right with a radius of 103.00 feet and a central angle of 21° 15' 42", the chord azimuth and distance being
- 5° 38' 51" 38.00 feet to the point of beginning and containing an area of 1,783 square feet or 0.041 acre, more or less, as per survey of Edgardo V. Valera, Licensed Professional Land Surveyor No. 5076, with Valera, Inc., dated April 1, 1998.

Being all the property described in Deed dated February 17, 2000, recorded March 8, 2000 in said Bureau of Conveyances as Document No. 2000-030812.

SUBJECT, HOWEVER, to the following:

1. Reservation in favor of the State of Hawaii of all mineral and metallic mines.

2. The rights of the United States of America, State of Hawaii, the municipality and the public, in and to that part of the premises in question falling in the bed of Hanehoi Stream; also the rights of the riparian owners in and to the free and unobstructed flow of the water of said stream, if any.

3. AS TO PARCEL FIRST:

(a) Undefined 3 feet wide easement for access purposes for visitation and maintenance of the Grave Site located at Lot 2 of this subdivision, as per survey of Edgardo V. Valera, Licensed Professional Land Surveyor No. 5076, with Valera, Inc., dated April 1, 1998, as disclosed in Deed recorded as Document No. 2000-030812.

(b) 100 year inundation limits along the top banks of Hanehoi Stream as shown on the subdivision plat on file with the Department of Public Works and Waste Management (LUCA File No. 2.2234), as disclosed in Deed recorded as Document No. 2000-030812.

4. Grant of Easement in favor of GTE Hawaiian Telephone Company Incorporated, dated October 5, 1989, recorded in said Bureau of Conveyances in Liber 24052 at page 596, granting an easement for utility purposes.

5. Private Water System Agreement dated February 28, 1990, recorded in said Bureau of Conveyances as Document No. 90-048437.

6. Subdivision Agreement (Three Lots or Less) dated October 6, 1995, recorded in said Bureau of Conveyances as Document No. 95-159240.

7. Subdivision Agreement (Agricultural Use) dated October 6, 1995, recorded in said Bureau of Conveyances as Document No. 95-159241.

8. Agreement To Waive Electrical Improvements and Indemnification dated September 24, 1995, recorded in said Bureau of Conveyances as Document No. 96-001686.

9. Modification of Subdivision Requirements Agreement dated March 1, 1996, recorded in said Bureau of Conveyances as Document No. 96-056338.

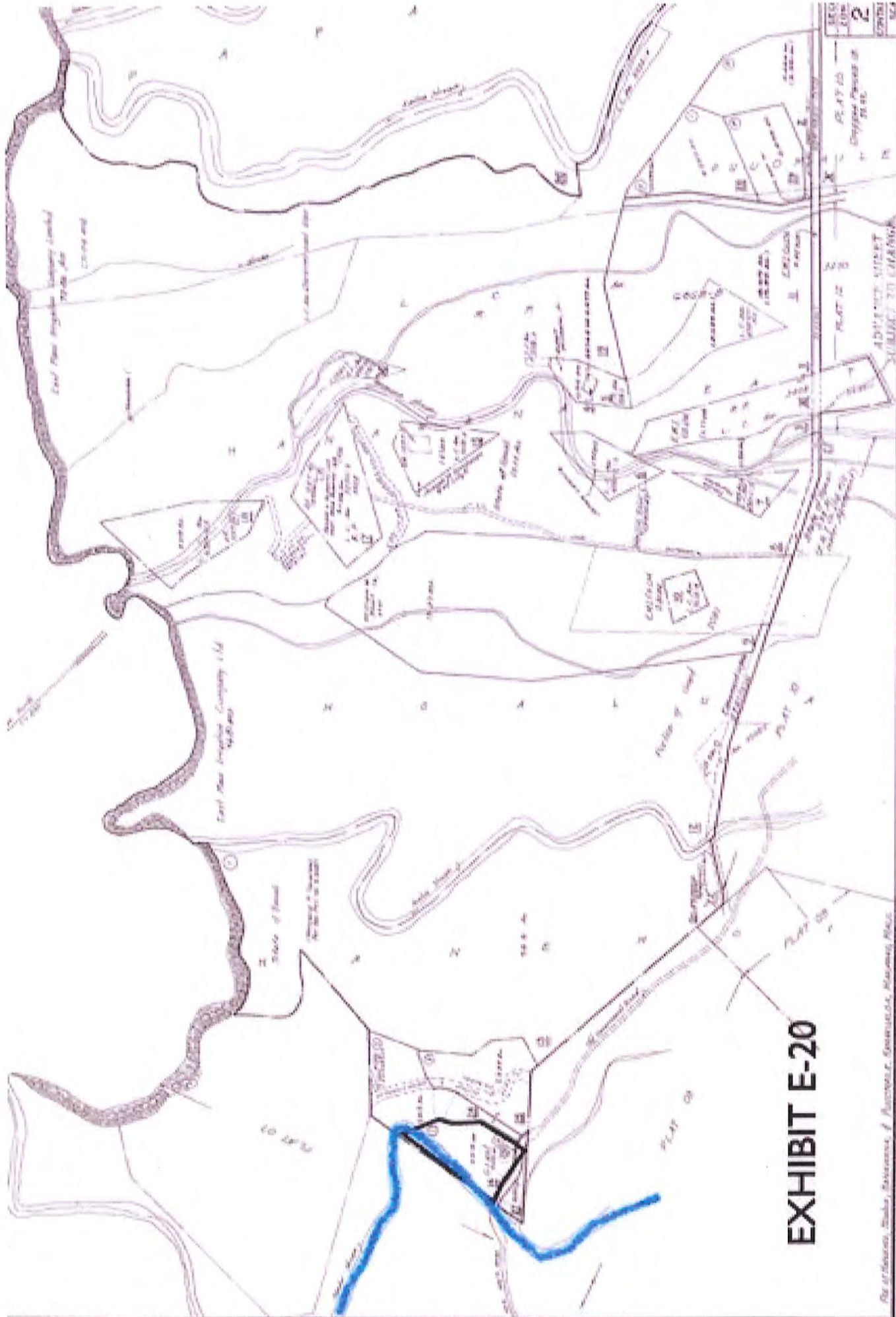
10. Any and all trails, archeological sites, burial cave(s) and/or burial grounds that may be shown by an accurate on the ground survey, as disclosed in Deed recorded as Document No. 2000-030812.

11. Rights of the State of Hawaii in and to any and all trails, roads, archeological sites, burial ground(s) or cave(s), prehistoric and historic remains, all surface and ground waters appurtenant to said land and the right to capture, divert or impound the same and to occupy and use so much of the land as may be required in the exercise of this right reserved, as disclosed in Deed recorded as Document No. 2000-030812.

12. Claims arising out of rights customarily and traditionally exercised for subsistence, cultural, religious, access or gathering purposes as provided for in the State of Hawaii Constitution or Sections 1-1 or 7-1 of the Hawaii Revised Statutes.

13. Water System Agreement dated August 19, 1998, recorded in said Bureau of Conveyances as Document No. 98-143968.

End of Exhibit "A"



**EXHIBIT E-20**

Be of various, make, resistance, of structure, construction, housing, etc.

REG	PLAT 01	2
DATE	Drop in	PLAT
NO.	PLAT	NO.



SUPPLEMENTAL DECLARATION  
FOR ALL OWNERS OR USERS OF WATER

1. The following statement is in my own words and describes the basis of the evidence that allows me to lay claim to these water rights or uses: (identify type of evidence, witnesses, past use, projected use and any changes if applicable; when complete attach this form to the State of Hawaii Declaration of Water Use form that is applicable)

MY NAME IS STAN RUSHWORTH, AND MY PROPERTY IS ON THE STREAMBED OF HAIHE HOI STREAM. TARO CULTIVATION IS EVIDENT ON THE WEST BANK OF THE STREAM ON MY PROPERTY AND I KNOW THE ORIGINAL PURPOSE WAS TARO CULTIVATION, WHICH I INTEND TO CONTINUE, ALONG WITH AQUACULTURE + AGRICULTURE USE, SUCH NEEDS BEING 100,000 GALLONS/DAY. I CLAIM RIGHTS TO THIS USAGE OF HAIHE HOI STREAM.

2. I  did or  did not receive notice from the State of Hawaii Commission on Water Resource Management regarding the registration and declaration of water use.

3. I declare that the contents of the above Supplemental Declaration of Water Use are the truth to the best of my knowledge.

Water User's Signature: Stanley E. Rushworth Date: 5-25-89  
Printed Name: STANLEY E. RUSHWORTH

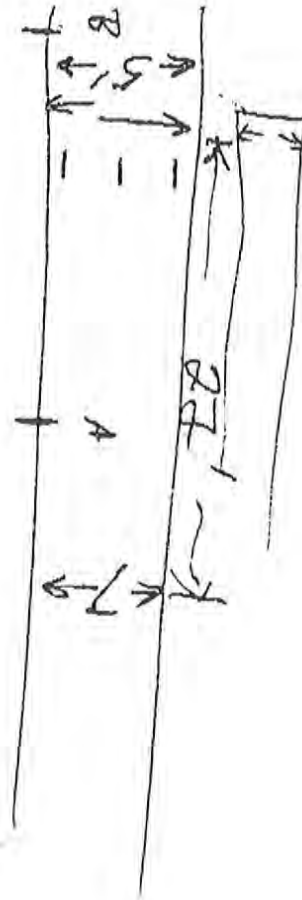
TMK 2-9-11-14(2)

**EXHIBIT E-21**

flow in Hanchoi st

May 1989

Dave  
Martin  
842-9774



18" Deep

45 seconds

attn: Isaac Hall  
for Ned's Carving

March 15, 2004

Mr. Ernie Lau  
Deputy Director  
State of Hawaii Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Lau,

As suggested by Mr. Charley Ice, I am writing to request a form for a claim for the riparian rights stated in my deed to my property here in East Maui. The property, TMK # 2-9-11-14 (2), is a 2.21 acre flower farm and former taro lo'i bordered on one side by Hanehoi Stream, which is diverted by East Maui Irrigation Company. I have owned the property for nearly three years; approximately 1 acre is planted in commercial tropical flowers, in addition to a substantial area of dryland taro and a large vegetable garden. I would like to add wetland taro if I could be assured of a water supply.

The former owner of the property, Stan Rushworth, registered a request for 100,00 gallons per day of water use on May 25, 1989 (copy enclosed), along with a stream flow chart done at that time (I don't have a copy of the chart, but you will see the information in a note on the bottom of the declaration). The chart is in your files at CWRM under Mr Rushworth's name, along with the original copy of the request.

I appreciate your attention to this matter. My mailing address and telephone are below.

Mahalo,

Neola Caveny  
445 Huelo Road  
Haiku, HI 96708  
573-1451

**EXHIBIT E-22**



**EXHIBIT E-23 "A"**

**EXHIBIT E-23 "B"**

**close up view**



**two 4" Hanehoi stream  
bypass pipes installed by  
EMI @ upstream side  
Lowrie ditch diversion.  
Stream levels are often  
low and pipes are  
clogged. 8/29/2013**



Same 4" bypass pipes on Hanehoi stream installed by EMI (date unknown). This view is on downstream side of EMI

Lowrie diversion.

.74 mgd is supposed to be available above the diversion, but no IFS is set for below the diversion

This pipe does not allow not enough water volume to reach very far down the stream and stream life can't climb the pipe" even when rains fill the stream and they could survive in its waters

photo: 8/29/2013

EXHIBIT E-23 "C"

Address Association NAICS

DBA Name: PUALANA FARMS

Street: 445 Huelo Rd

City: Haiku

State: Hawaii

Zip: 96708-5721

County: Maui

Undifferentiated

Normalized

Save

Close

STATE OF HAWAII  
DEPARTMENT OF TAXATION  
P.O. BOX 1169  
WAILUKU, HAWAII 96793  
*Ed*

**EXHIBIT E-24**

TRK : (2) 2-9-07 04  
 E.M.I. Co., Ltd.  
 (owner)

*Han*  
 Farm Plan  
*han*

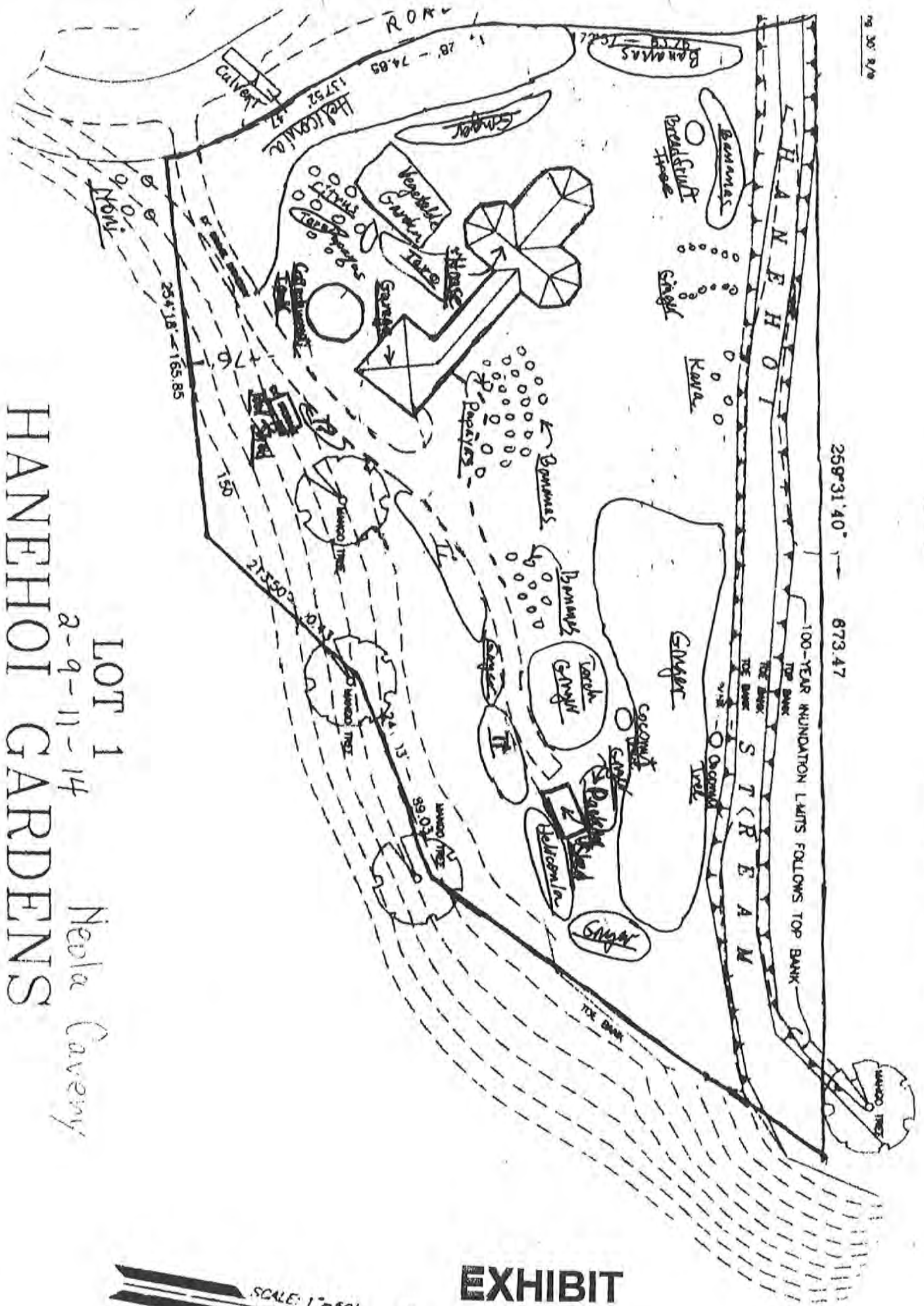
19 30' 8/9

259°31'40" → 673.47

100-YEAR FLOODATION LIMITS FOLLOWS TOP BANK

H A N E H O I

S T R E A M



LOT 1  
 2-9-11-14  
 Nedla Cavany

**EXHIBIT**

SCALE: 1" = 50'

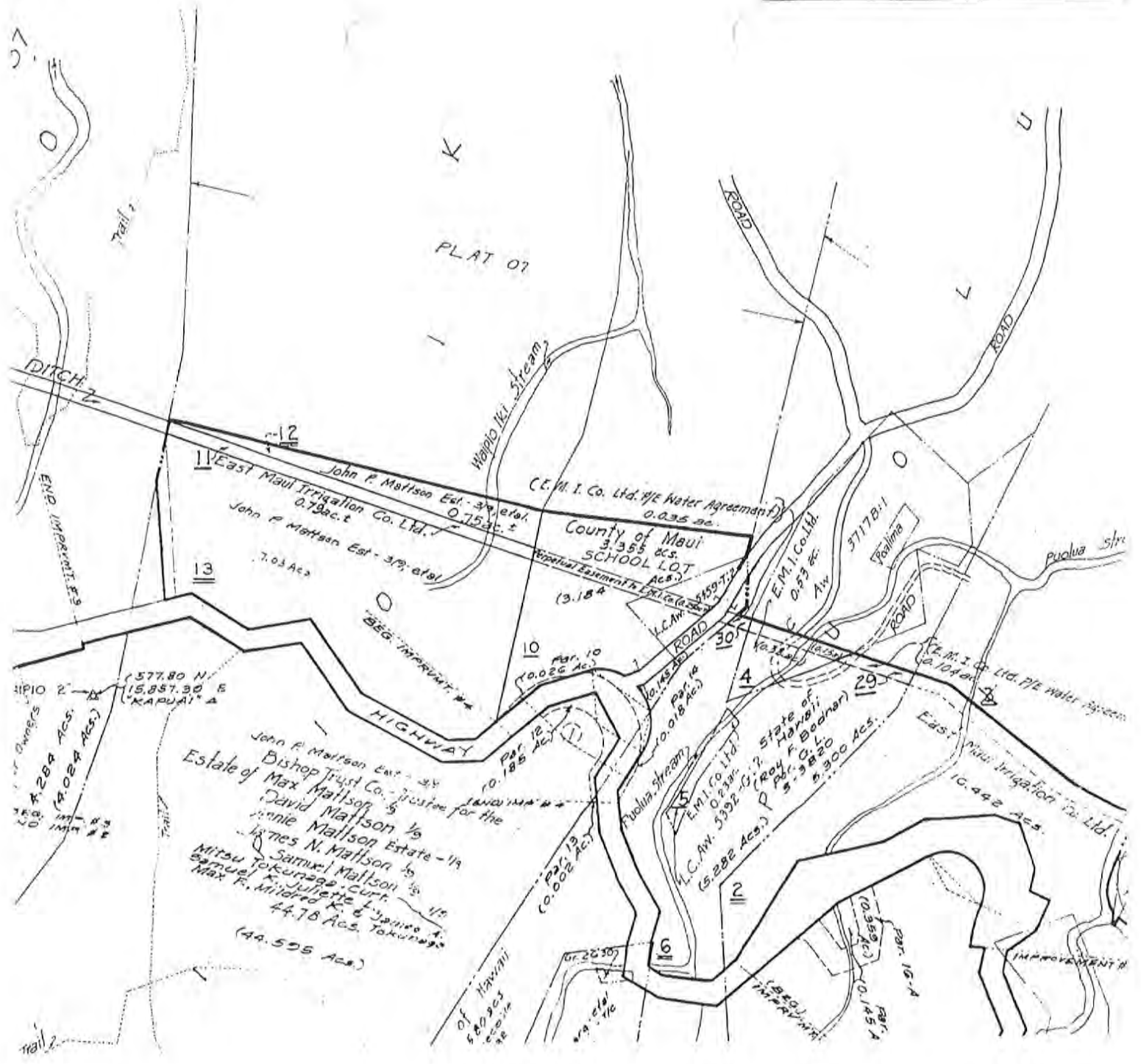


EXHIBIT E-25



MAUI COUNTY PARCEL HISTORY (TT101) FOR:

TMK: 2-9-008-034-0000

PAGE: 1

05/18/2004  
INSTR-DESC: Correction

TRANS NO: 248583  
INSTR-DATE: 05/18/2004  
REC-DATE: 05/18/2004

AREA: 15.1200 ACRES

PER OAHU TMB/WKK:  
WHEREAS PREVIOUS ROUTE SLIP BY TRANS NO. 245658  
REITERATED AREA TO 6.200 AC PER PREVIOUS ENTRY BY  
LUCA MAP 2.2414.  
WHEREAS NO MODERN SURVEY EXIST AND NO CONTENTION  
TO AREA OR BOUNDARY EXIST EITHER RECORDED OR  
OTHERWISE SO AS TO MAKE ANY SUBSEQUENT REVISION MADE,  
ERRONEOUS. ONLY AREA OF RECORD, IS ORIGINAL GRANT AREA  
OF 15.12 AC. THEREFORE ONLY AREA WHICH HAS LEGAL  
STANDING CURRENTLY IS THAT OF THE ORIGINAL GRANT.  
CORRECT RECORDS TO SHOW SAME AND AREA IS RETURNED  
TO 15.12 AC.

F/D: AREA CORRECTED

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	LEE.KAILI K				
FOR ASSESSMENT YEAR 2011					
PITT 5	LAND VALUE:	\$111,100		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0
FOR ASSESSMENT YEAR 2010					
PITT 5	LAND VALUE:	\$124,700		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0
FOR ASSESSMENT YEAR 2009					
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0
FOR ASSESSMENT YEAR 2008					
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0
FOR ASSESSMENT YEAR 2007					
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0
FOR ASSESSMENT YEAR 2006					
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0
FOR ASSESSMENT YEAR 2005					
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

SITE ADDRESS: HUELO  
HAIKU 96708

MAILING ADDRESS: LEE,KAILI K  
46A KUPEE PLACE  
MAKAWAO HI 96768

12/30/2003  
INSTR-DESC: Area revision

TRANS NO: 245658  
INSTR-DATE: 12/30/2003  
REC-DATE: 12/30/2003

AREA: 6.2000 ACRES

(2908-34)  
CORRECT AREA TO: 6.2 AC PER TMB OAHU  
(REF: PER WKK - AREA SHOULD HAVE BEEN 6.2 AC (PL) PER  
TMB M98-272. AREA WAS CHANGED PER PLANIMETER.  
HOWEVER, MAP WILL STILL RETAIN REFERENCE TO AREA:

**EXHIBIT E-26**

MAUI COUNTY PARCEL HISTORY (TT101) FOR:

TMK: 2-9-008-034-0000

"CLAIMS 15.12 AC" TO INDICATE AREA SHOWN PRIOR TO  
 USE OF PLANIMETER; NEW SURVEY RECOMMENDED)  
 F/D: AREA REVISED PER PLANIMETER

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	LEE,KAILI K				

FOR ASSESSMENT YEAR	2004				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

SITE ADDRESS: HUELO

MAILING ADDRESS: LEE,KAILI K  
 46A KUPEE PLACE  
 MAKAWAO HI 96768 0000

03/17/1998

INSTR-DESC: ESMT LUCA# 2.2414

INSTR\_NO:0000000000

TRANS NO: 43708

INSTR-DATE: 02/26/1998

ACK/EFF DATE: 03/17/1998

AREA: 15.1200 ACRES

DESIGNATION ACCESS & UTILITY ESMT "1"  
 PER PLAN BY NEWCOMER-LEE LAND SURVEYORS INC APPROVED 3/17/  
 98

F/D: ESMT

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	LEE,KAILI K				

FOR ASSESSMENT YEAR	2003				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

FOR ASSESSMENT YEAR	2002				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

FOR ASSESSMENT YEAR	2001				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

FOR ASSESSMENT YEAR	2000				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

FOR ASSESSMENT YEAR	1999				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

SITE ADDRESS: HUELO

MAILING ADDRESS: LEE,KAILI K  
 46A KUPEE PLACE  
 MAKAWAO HI 96768 0000

09/12/1996

INSTR-DESC: QUITCLAIM DEED

INSTR\_NO:9600130974

TRANS NO: 43706

INSTR-DATE: 10/25/1995

REC-DATE: 09/12/1996

ACK/EFF DATE: 09/12/1996

AREA: 15.1200 ACRES

STATE-CONV-TAX: \$ 0.00

FROM: MATILDA KUMSUNI LEE AKA RUTH LEE AKA RUTH L WILSON (M  
 )

TO: SOLOMON LEE JR (M)

ALL OF GRANTOR'S UND INT IN & TO THE MAUI REAL PROPERTIES ID  
 ENTIFIED AS

TMKS 2908-34; 20(AS GIVEN)08-35 & 2908-07

MAUI COUNTY PARCEL HISTORY (TT101) FOR:

TMK: 2-9-008-034-0000

TMB NOTE: TMK AREA = 6.20 (PL) CLAIMS 15.12 AC  
 F/D: KEYED ONLY - GRANTORS INTEREST UNKNOWN

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	LEE,KAILI K				

FOR ASSESSMENT YEAR	1998				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

FOR ASSESSMENT YEAR	1997				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

SITE ADDRESS: HUELO

03/20/1995

INSTR-DESC: QUITCLAIM DEED

INSTR\_NO:9500037310

TRANS NO: 43707  
 INSTR-DATE: 01/01/1900  
 REC-DATE: 03/20/1995  
 ACK/EFF DATE: 03/20/1995

AREA: 15.1200 ACRES

STATE-CONV-TAX: \$ 0.00

ACK DATE: 02/01/95  
 FROM: KUULEI KEPANI LEE CARSON (W)  
 TO: SOLOMON LEE JR (M)

ALL OF GRANTORS UND INT INT: 2908-34; 2908-35 & 2908-07  
 TMB NOTE: TMK AREA = 15.12 AC  
 F/D: KEYED ONLY - GRANTOR'S INTEREST UNKNOWN

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	LEE,KAILI K				

FOR ASSESSMENT YEAR	1996				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

SITE ADDRESS: HUELO

11/08/1993

INSTR-DESC: QUITCLAIM DEED

INSTR\_NO:9300184837

TRANS NO: 43704  
 INSTR-DATE: 09/22/1993  
 REC-DATE: 11/08/1993  
 ACK/EFF DATE: 11/08/1993

AREA: 15.1200 ACRES

STATE-CONV-TAX: \$ 0.00

FROM: SOLOMON LEE, SR. (M)  
 TO: SOLOMON LEE, JR., TRUSTEE UNDER THAT UNRECORDED SOLOMON  
 LEE, SR. REVOCABLE LIVING TRUST DATED 9/22/93  
 REAL PROPERTY IDENTIFIED AS TMK (2) 2-9-08-34, (2) 2-0-08-35  
 AND (2) 2-9-08-7

F/D: KEYED ONLY-GRANTOR'S INT UNKNOWN

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	LEE,KAILI K				

FOR ASSESSMENT YEAR	1995				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

FOR ASSESSMENT YEAR	1994				
PITT 5	LAND VALUE:	\$400		EXEMPT LAND VALUE:	\$0
	BUILDING VALUE:	\$0		EXEMPT BUILDING VALUE:	\$0

SITE ADDRESS: HUELO

11/08/1993

INSTR-DESC: QUITCLAIM DEED

TRANS NO: 43705

MAUI COUNTY PARCEL HISTORY (TT101) FOR:

TMK: 2-9-008-034-0000

PAGE: 4

INSTR\_NO:9300184836  
STATE-CONV-TAX: \$ 0.00

REC-DATE: 11/08/1993  
INSTR-DATE: 10/29/1993  
ACK/EFF DATE: 11/08/1993

AREA: 15.1200 ACRES

FROM: ISAAC JOSEPH LEE (S)  
TO: SOLOMON LEE, JR., TRUSTEE UNDER THAT UNRECORDED SOLOMON LEE, SR.  
REVOCABLE LIVING TRUST DATED 9/22/93  
REAL PROPERTY IDENTIFIED AS TMK NOS. (2) 2-9-09-34, (2) 2-0-08-35  
AND (2) 2-9-08-7  
F/D: KEYED ONLY-GRANTOR'S INT UNKNOWN

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	LEE,KAILI K				

10/07/1987

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	LEE,KAILI K				
FOR ASSESSMENT YEAR 1993					
PITT 5	LAND VALUE:	\$400			EXEMPT LAND VALUE: \$0
	BUILDING VALUE:	\$0			EXEMPT BUILDING VALUE: \$0
FOR ASSESSMENT YEAR 1992					
PITT 5	LAND VALUE:	\$400			EXEMPT LAND VALUE: \$0
	BUILDING VALUE:	\$0			EXEMPT BUILDING VALUE: \$0
FOR ASSESSMENT YEAR 1991					
PITT 5	LAND VALUE:	\$400			EXEMPT LAND VALUE: \$0
	BUILDING VALUE:	\$0			EXEMPT BUILDING VALUE: \$0
FOR ASSESSMENT YEAR 1990					
PITT 5	LAND VALUE:	\$400			EXEMPT LAND VALUE: \$0
	BUILDING VALUE:	\$0			EXEMPT BUILDING VALUE: \$0
FOR ASSESSMENT YEAR 1989					
PITT 5	LAND VALUE:	\$400			EXEMPT LAND VALUE: \$0
	BUILDING VALUE:	\$0			EXEMPT BUILDING VALUE: \$0
FOR ASSESSMENT YEAR 1988					
PITT 5	LAND VALUE:	\$418			EXEMPT LAND VALUE: \$0
	BUILDING VALUE:	\$0			EXEMPT BUILDING VALUE: \$0

-----SEE PARCEL SHEETS FOR MORE INFORMATION-----



# ALPHABETICAL INDEX OF AWARDS BY AWARDEE HAMAKUA, HAWAII

## HAMAKUA, HAWAII

Awardee	L. C. A.	Book	Page	R. P.	Book	Page	Location	Area	AP.
Ahukini	3757	4	243	5238	21	131	Napoopoo, Waipio	4.40 Acs	2
Apua	100-B	4	631	7471	27	747	Kaoo 2, Waipio	9.75 "	1
Auloo	8013	4	594	6710	24	793	Papuaa	10.25 "	2
Auwae	10992	4	601	.....	...	...	Kapoaula	16.50 "	1
Auwae	7268	4	581	5126	20	479	Ahuakolea, Waimanu	3.85 "	1
Davis, Frank	6202	3	135	7651	28	513	Kamoouau	162.00 "	1
Haawinaaupono	7833	4	619	6652	24	677	Haina 2	6.66 "	1
Haina, L.	8407	4	619	7325	27	259	Kaumoali & Heneheneula	9.50 "	2
Haleihonua	11037	6	405	8082	34	505	Kaloakua, Waipio	4.50 "	5
Hamohamo	8202	4	159	5011	20	245	Kaoo, Waipio	4.00 "	1
Haneence	9810	6	461	7400	27	511	Ahualoa	10.50 "	1
Hapuu	8201	4	256	4906	20	35	Napoopoo, Waipio	2.10 "	3
Honuaiwa	8042	6	463	7568	28	237	Ahualoa	10.25 "	1
Hookio	8203	6	402	.....	...	...	Kaoo, Waipio	2.00 "	3
Houulu	8141	6	460	6697	24	767	Nienie	0.43 "	1
Hua	8209	4	647	7576	28	269	Paauilo	9.00 "	1
Huai	7822	4	620	7078	26	567	Namoku	13.00 "	1
Huai	8210	4	615	4964	20	151	Kemau	14.50 "	1
Huaka	8131	4	589	6747	26	23	Koloaha	11.10 "	2
I	10490-B	4	646	.....	...	...	Aamano	7.20 "	1
Iaukea	10615	4	649	6197	23	561	Opihilala	9.90 "	1
Ikoa	7275	4	581	5028	20	281	Kaiwiholehole, Waimanu	5.00 "	1
Inaina	10490-C	4	590	7204	26	757	Lauka	9.00 "	1
Iwula	3735	6	409	7769	30	81	Kaauhuhu	12.00 "	1
Kaaea	7861	6	200	7886	30	477	Napoopoo, Waipio	2.58 "	2
Kaaeae	8381	5	105	3771	16	301	Haukoi	19.75 "	1
Kaaeae	8381	4	253	.....	...	...	Napoopoo, Waipio	3.55 "	2
Kaai, N.	7131	6	410	5120	20	467	Kanahonua	11.50 "	1

**EXHIBIT E-28**

## HAMAKUALOA, MAUI

## HAMAKUALOA, MAUI

Awardee	L. C. A.	Book	Page	R.P.	Book	Page	Location	Area	AP.
Moi	5459	3	451	6894	26	241	Hanehoi, Waipio	1.68 Acs	3
Mua	5616-B	8	334	2815	13	91	Kuahanahana	1.06 "	2
Naaeae	5459-A	3	446	2218	9	533	Hanehoi	1.53 "	2
Naeole	5439	8	405	2187	9	405	Haiku	1.73 "	1
Nahinu	3905	7	45	2171	9	345	Pauwela	4.47 "	3
Nakaikuaana	5521	8	375	3233	14	259	Honopou	3.32 "	3
Nalopi	3336	8	418	2194	9	433	Kuiaha	5.15 "	1
Namauu, N.	10474	3	239	4471	18	393	Ulumalu (Ahp.)	1376.00 "	1
Namauu for Kekuanaoa	10474	9	256	4490	18	469	Kaupakulua (Ap. 6) by name only		1
Namokuelua	4564	8	350	2185	9	397	Haiku	2.10 "	1
Naone	4284-D	9	466	2776	13	11	Pauwela	2.94 "	2
Naone	6510-R	5	503	2778	13	15	Lapo	2.83 "	2
Naoo	5459-S	7	48	2799	13	59	Halalii	3.06 "	1
Naoopu (Oia Oopu)	5516-D	8	335	2780	13	19	Kauhamao	7.43 "	2
Napohaku	5519-B	8	322	7085	26	581	Kaholo	2.76 "	2
Napoka	5494-D	5	512	.....	---	---	Keauala	3.00 "	1
Nawaiki	5361	3	611	.....	---	---	Papaaea	2.04 "	2
Nika	5392-H	7	47	3328	14	449	Pahoa	7.80 "	3
Niu	6510-PP	5	514	2178	9	369	Pauwela	1.00 "	2
Olomele	5459-N	3	447	8113	35	77	Hanehoi	0.48 "	2
Onaha	3304-B	5	507	.....	---	---	Haiku	2.02 "	3
Opunui	6510-EE	5	518	.....	---	---	Pauwela	2.51 "	4
Owili	5522	3	438	6559	24	489	Hoalua	11.41 "	4
Paaluhi	5459-W	8	402	7068	26	547	Halehaku	0.18 "	1
Pahia	5459-R	7	46	4071	17	139	Pulehu	4.34 "	4
Pahua	6510-UU	5	514	5502	21	659	Pauwela	2.27 "	2
Paalea	5451-B	7	453	5290	21	235	Honopou	10.01 "	2
	{3829								
Paale, Nehemia	{6613	7	302	7895	30	513	Pulehukiki	1.97 "	2



STATE OF HAWAII  
DEPARTMENT OF ACCOUNTING  
AND GENERAL SERVICES

ARCHIVES DIVISION  
Iolani Palace Grounds  
364 S. King Street  
Honolulu, Hawaii 96813

July 22, 2008


Solomon Lee  
46 A Kupee Place  
Pukalani, Maui 96768

Dear Mr. Lee:

ENCLOSED IS:

- The requested material or information.  
Survey Notes for Royal Patent Grant No. 1080
- Our receipt # for \$
- Information that may be helpful.
- Material you sent is being returned.

OTHER:

  
W. Kaahanui, Office Assistant  
Historical Records Branch

**EXHIBIT** E-29





STATE OF HAWAII  
DEPARTMENT OF ACCOUNTING  
AND GENERAL SERVICES

ARCHIVES DIVISION  
HAWAII STATE ARCHIVES  
IOLANI PALACE GROUNDS  
HONOLULU, HAWAII 96813

I, SUSAN SHANER, State Archivist of the Public Archives of the State of Hawai'i, do hereby certify that the attached document is a true and correct copy of Survey Notes for Royal Patent Grant No. 1080, to PUHA, Hanehoi, Hamakualoa, Maui, from Grant Survey Notes [Series 526], Commissioner of Public Lands.

on file in the STATE ARCHIVES, at Honolulu, State of Hawai'i.

Witness my hand and seal this 21st day of July, 2008 at Honolulu, State of Hawai'i.

*Susan Shaner*  
for SUSAN SHANER, STATE ARCHIVIST

Royal Patent Grant

No. 1080

\*\*\*\*\*

PUHA

Hanehoi, Mamakualoa, Maʻi

\*\*\*\*\*

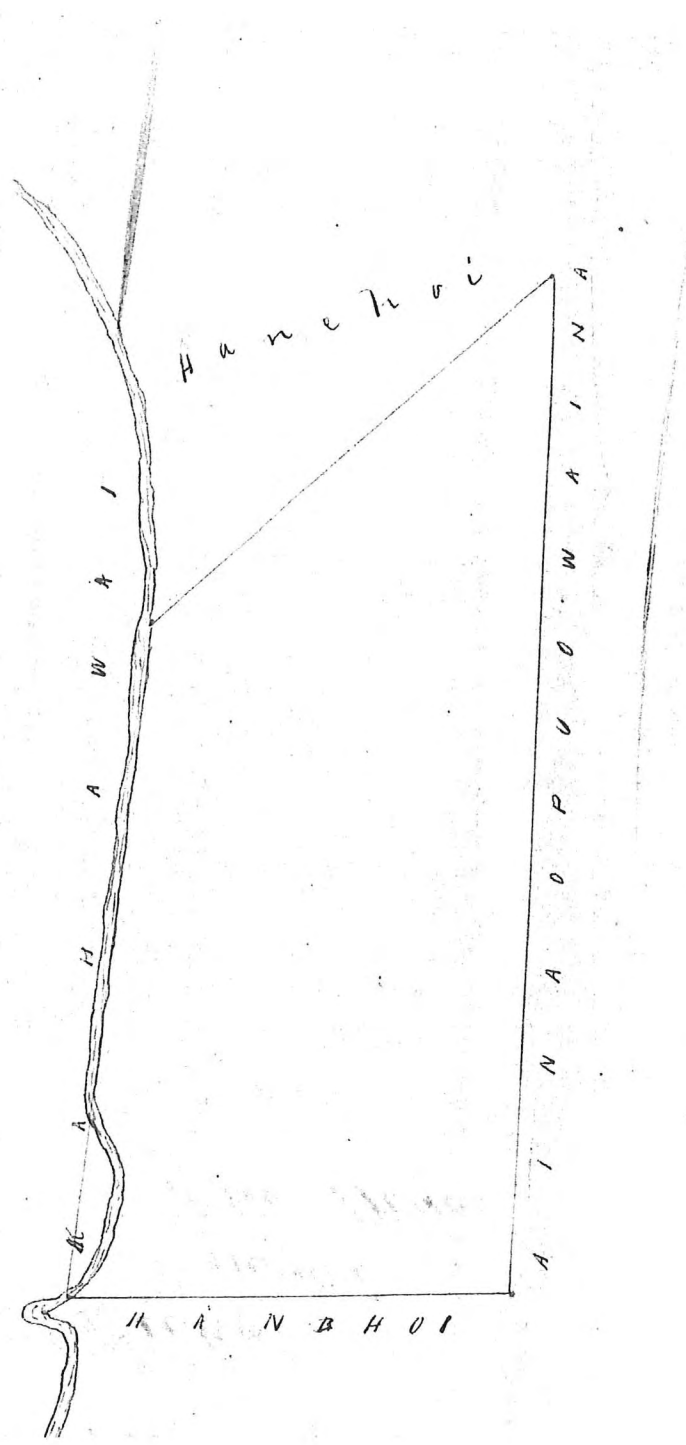
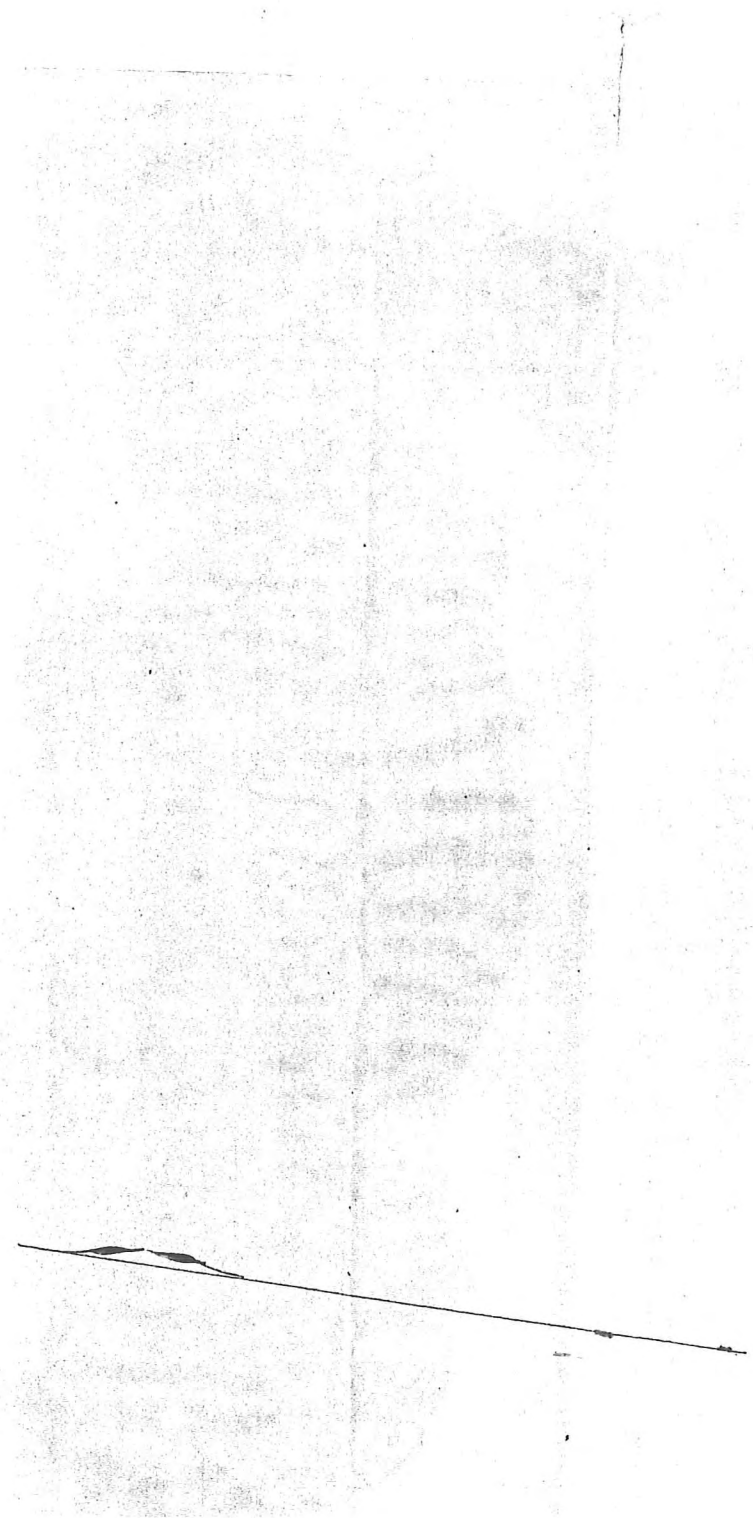
Ahaua Aina o Tuharua ma Hanehori  
Ahupuaa ma Hamakua o Maui

E hoomaka ma ke piki o maha  
Makai o keia, pili me ke Kahawai o holo  
Lem. 11' Hiko  $9\frac{20}{100}$  Kaul. i ka aina o Tuwaina  
Ma. 82° Hiko  $1\frac{14}{100}$  Kaul. Ma. 55° Kaul. 11 Kaul.  
hiki i ke Kahawai, aia, holo ma ke  
Kahawai a hiki i kaahi i hoomaka  
Maia Ahaua Aina 15 $\frac{1}{2}$  Eka

Aua

November 4 1857

C. M. Hakala



4 Stant. Inika

Hulu USA

**PALAPALA SILA NUI.**

Ma keia palapala Sila Nui ke hoike aku nei o Kamehameha III., ke Alii uui a ke Akua i kona lokomaikai i hoonohe ai mauna o ko Hawaii Pae Aina, i na kanaka a pau, i keia ia, nona iho, a no kona mau hope Alii, ua haawi lilo loa aku oia ma ke ano aiodio ia *Puha*

peu e e waiho la ma *Keanehoi* : kona *wahi* kanaka i manao pono ia ia, i kela apana aina a  
ma ka Mokupuni o *Maui* *Keamalahua*  
a penei hoi ka waiho ana o na Mokuna :

*E hoomaka ma ke kahi Koukaha  
makai o keia, fili me ke kahawai; a holo ke  
10° Ni. 9.30 kaul. i ka aina o Puuwai; a. 82°  
Ni. 21.10 kaul. - a. 50° Ni. 4.00 kaul. hiki o ke  
kahawai; alaila holo ma ke kahawai a  
hiki i kahi i hoomaka i.*

a maloko o ia Apana

15/8

eka a oi iki aku oimi iki mui paha.

Eia ke kumu o ka lilo ana; ua haawi mai oia iloko o ka waibona waiwai o ke Aupuni i \$ 30.25

Aka, ua koe i ke Aupuni na mine minerala a me na mine

metala a pau.

Ke Puka

, ua aina la i haawiia, no na mau loa aku no,

ma ke ao aloha a no kona mau hoolina, a me kona waihoana, ua pili nae ka aubau a ka Poe Ahao-  
lalo a kau like ai ma na aina aloha a pau i kela manawa i keia manawa.

A i mea e ikeia'i, ua kau wau i ko'u inoa, a me ka Sila Nui o ko Hawaii Pae Aina ma

Honolulu, i keia la 24 o Pelelualihi, 1859

Ima Kamehameha

Keoni'Ana

*Page 1000*

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
BUREAU OF CONVEYANCES  
P. O. BOX 2867  
HONOLULU, HAWAII 96803

Date Jul 20 1982

I hereby certify that the attached instrument is a true copy from the records of the Bureau of Conveyances of the State of Hawaii.



CONV 103  
APR 1977

Attest: *George H. Barkley*  
for REGISTRAR OF CONVEYANCES





1890

WILKINSON'S BILLS

Afa Zeia palapala Sila Nui ke hoike aku nei o Kamehameha III., ko Alii nui a ke Akua i kana lokomaikai i hoonoho ai malua o ko Hawaii Pae Aina, i na kanaka a pau, i keia la, eona ihu, a no kona mau hope Alii, na haawi lilo loa aku oia ma ka ano alodio ia *Peaha*

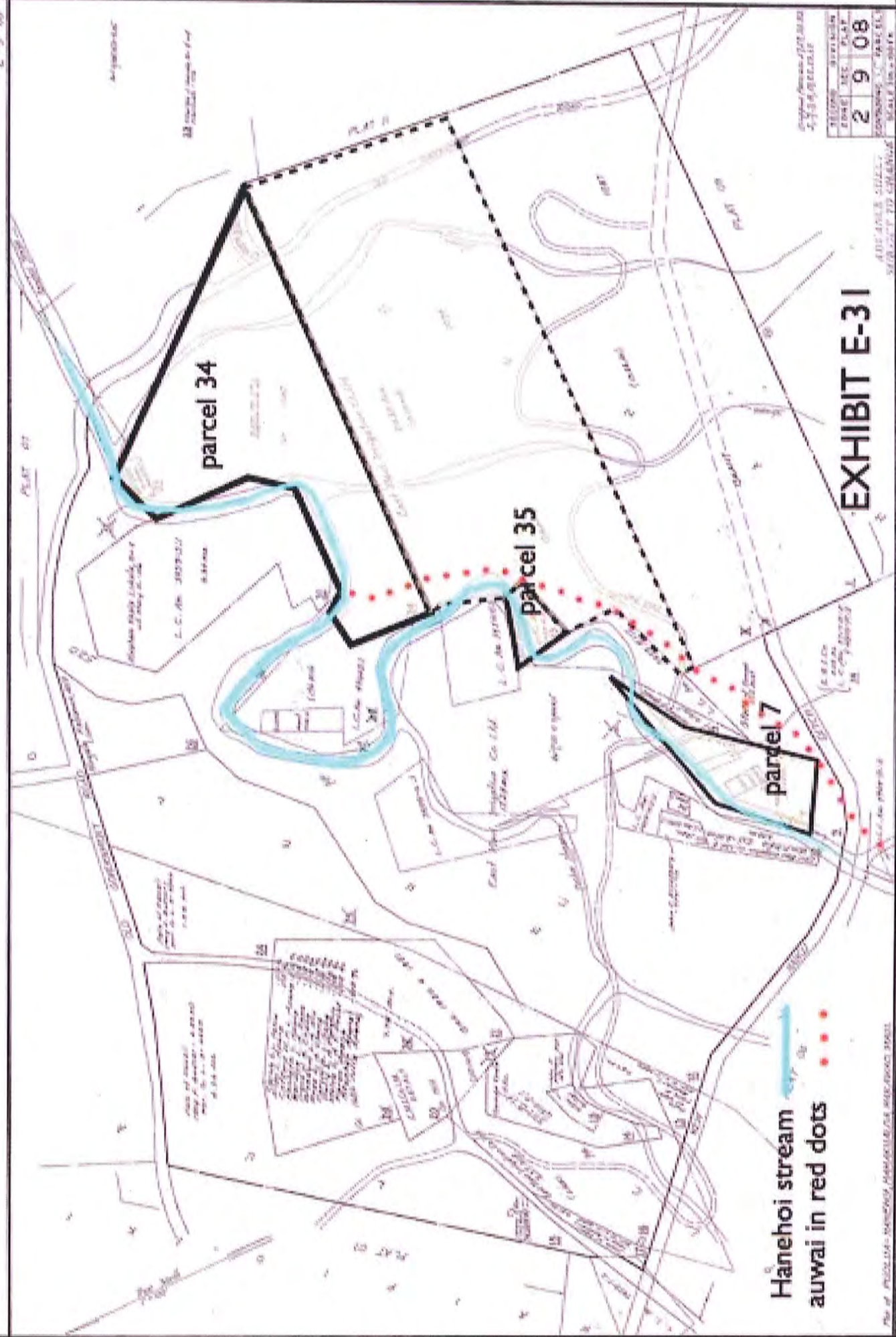
I kona *wahi* kanaka i maeo pono ia ia, i keia pena aino a  
pena e waiho la ma *Hanalei* *Kiama*  
luna ke Mokupuni o *Hawaii* a penai hoi ka waiho ana o na Mokuna :

*E hoomaka ma ke kiki Kamehameha  
makani o keia, pili me ke kaheka, a i keia la,  
10° Ni. 7.30 kauli, i ka aino o Punahele; a 82°  
Ni. 21.10 kauli. - a. 50° No. 1100 kauli. kiki i ke  
kahawai, a laia holo ma. ke kahawai a  
kiki i kiki i hoomaka.*





EXHIBIT E-30



PLAT	SECTION	PLAT
2	9	08

**EXHIBIT E-31**

Hanehoi stream  
awai in red dots

Map of PARCELS 7, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

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# Instream Flow Standard Assessment Report

## Island of Maui

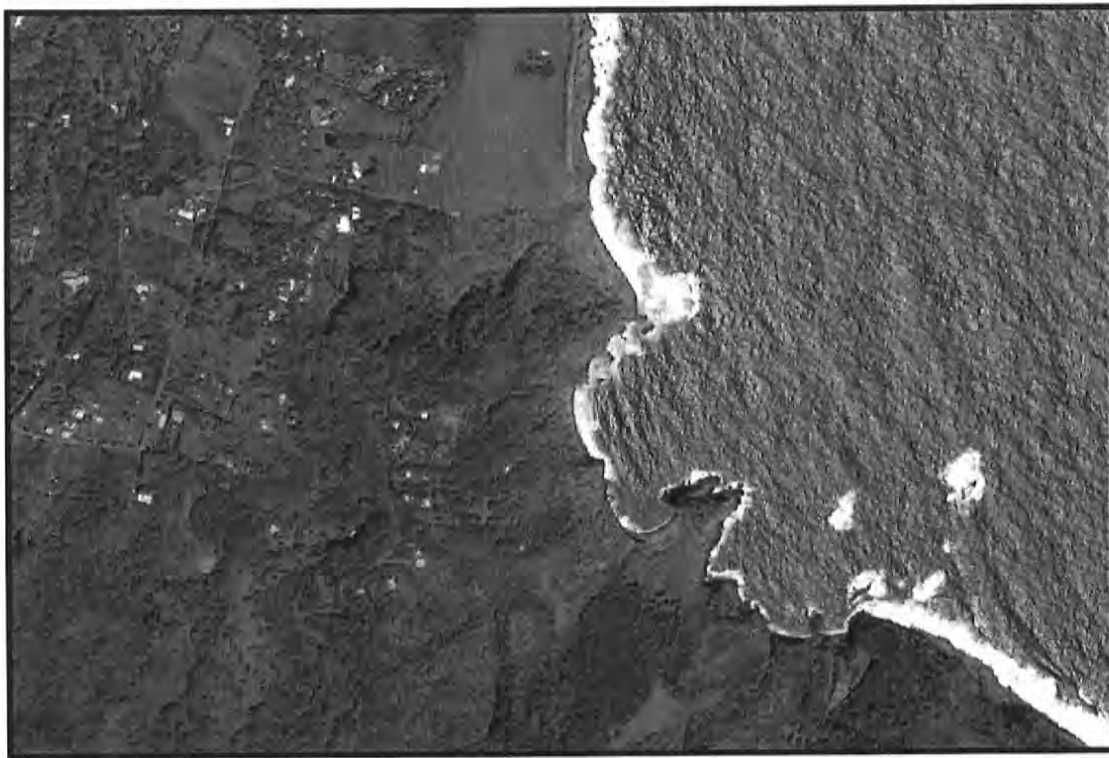
### Hydrologic Unit 6037

# Hanehoi

September 2008

PR-2008-02

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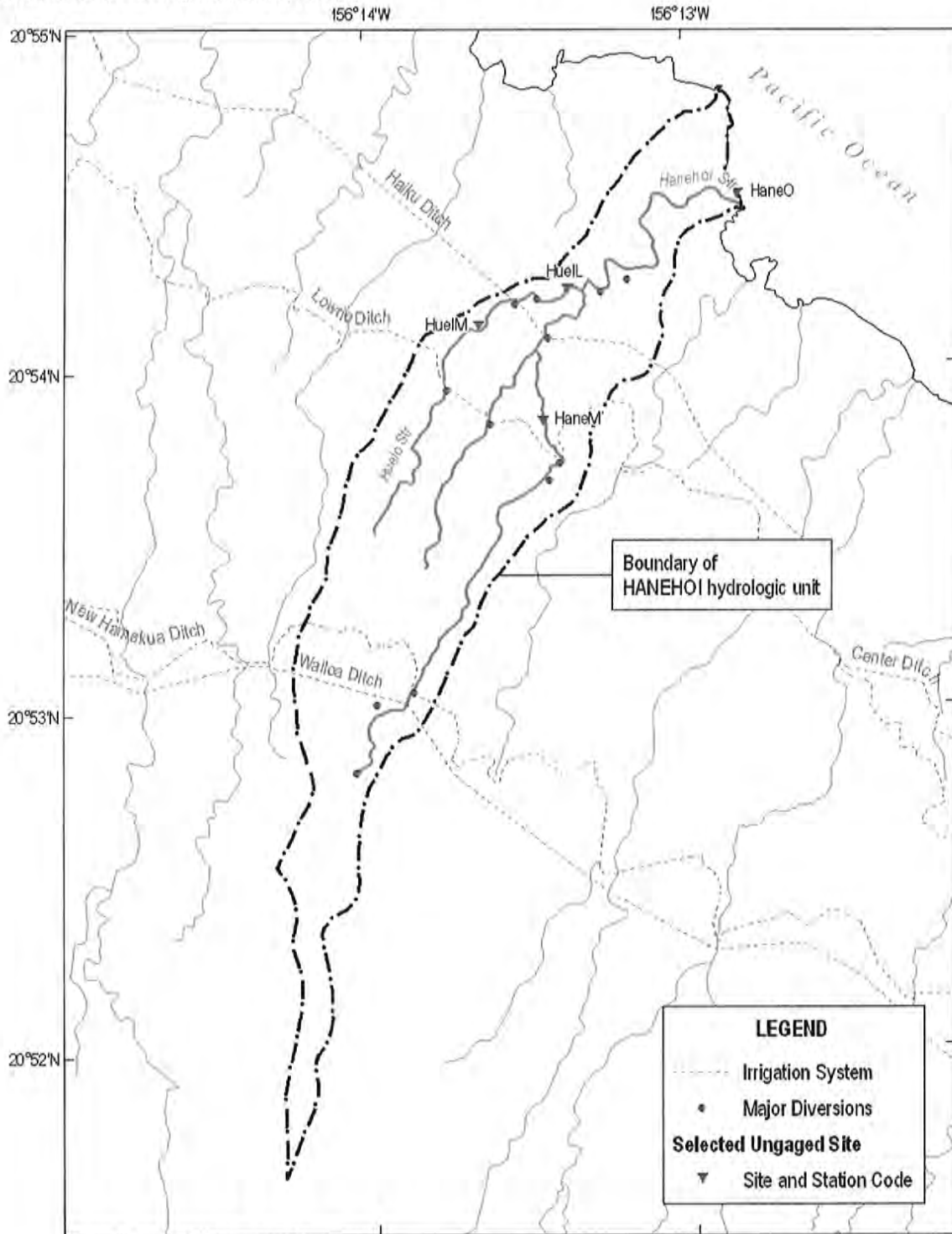
**State of Hawaii**  
Department of Land and Natural Resources  
Commission on Water Resource Management



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**EXHIBIT** E32

**Figure 3-1.** Location of diversions, irrigation systems, and selected ungaged sites in Hanehoi hydrologic unit (Source: State of Hawaii, Office of Planning, n.d.; 2004c; 2005).

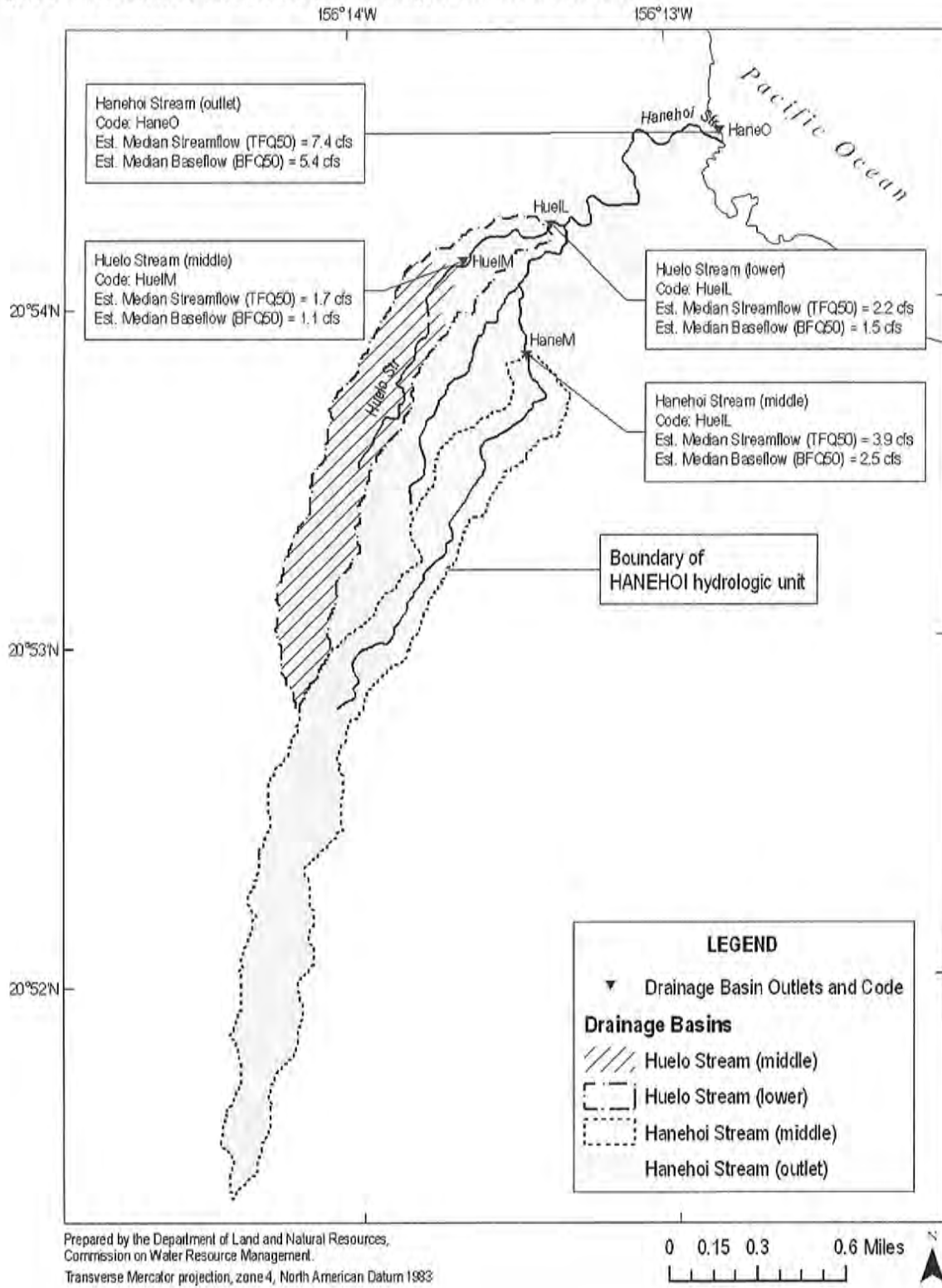


Prepared by the Department of Land and Natural Resources,  
Commission on Water Resource Management.  
Transverse Mercator projection, zone 4, North American Datum 1983

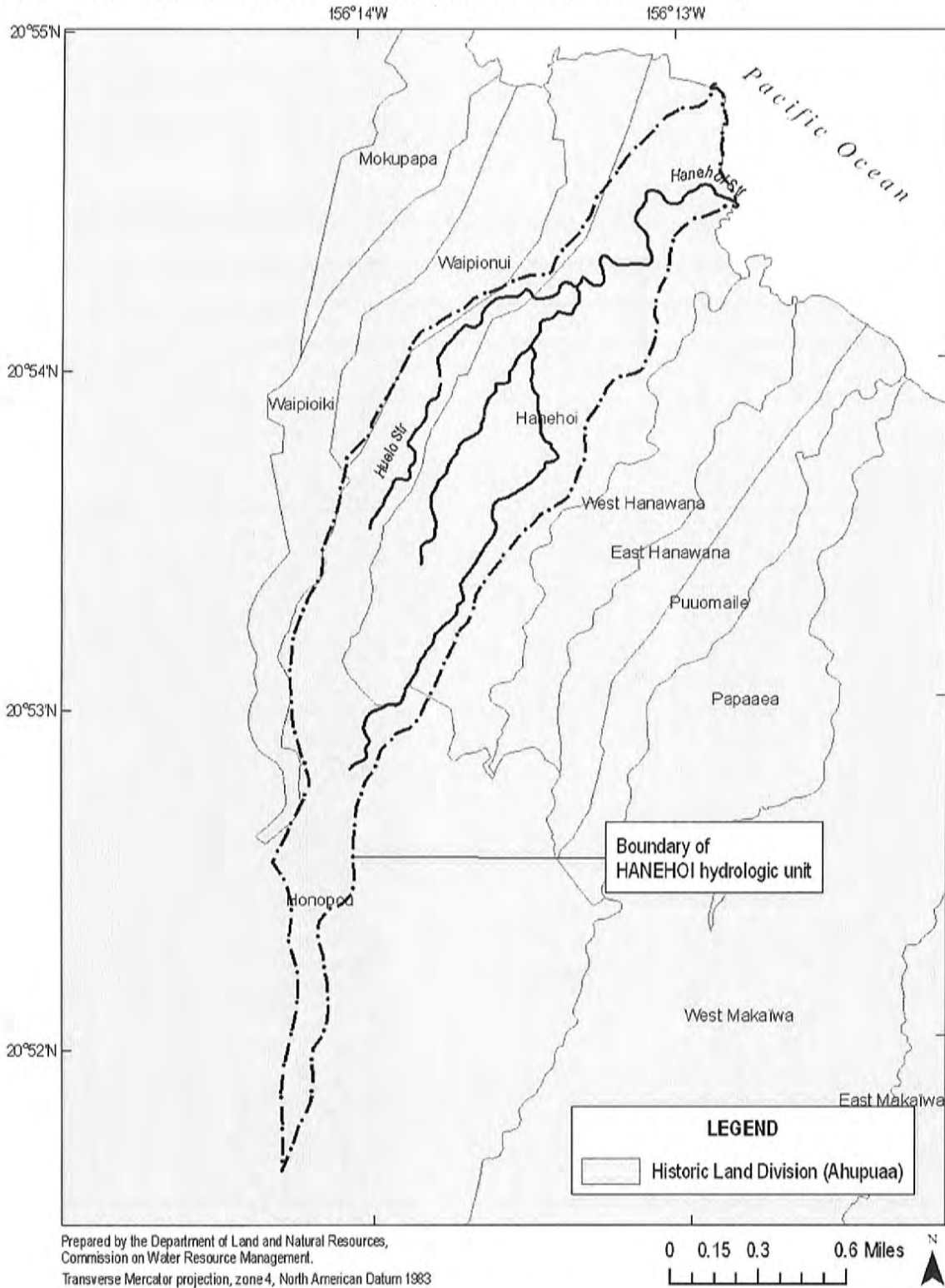
0 0.15 0.3 0.6 Miles

**EXHIBIT E-32**

Figure 3-4. Flow statistics for selected ungaged drainage basins of Hanehoi and Huelo.



**Figure 12-2.** Traditional ahupuaa boundaries in the vicinity of Hanehoi hydrologic unit. This hydrologic unit spans three ahupuaa – Waipionui, Honopou, and Hanehoi (Source: State of Hawaii, Office of Planning, 2007a).





**Table 13-1.** Registered diversions in the Hanehoi hydrologic unit.

[Source of photos are denoted at the end of each description; CWRM, Commission on Water Resource Management; DAR, Division of Aquatic Resources; EMI, East Maui Irrigation Company, Inc.; RMT, R.M. Towill Cooperation (R.M. Towill conducted field verifications on the island of Maui under contract with the Commission on Water Resource Management in late 2007); Arrows ( $\Rightarrow$ ) indicate general direction of water flow to, into, and through noninstream diversions; Chevrons ( $\sum$ ) indicate general direction of natural surface water flow]

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.155.6	EAST MAUI IRR	2-2-9-006:		Yes	Yes		

Water is diverted from Hanehoi Stream at Intake L-7 (Huelo #3 Intake) into the Lowrie Ditch. Registrant identified water use is for irrigation of approximately 36,000 acres of sugar and pineapple, industrial manufacturing and milling, and livestock. The diversion structure is concrete and has a divertable capacity of 6 mgd. Measurement of total flow of Lowrie Ditch, including this and other intakes, is available from USGS gaging station 16592000 (Lowrie Ditch at Honopou Gulch near Huelo). Please note that the diversion capacity of 6 mgd far exceeds the estimated median flow of the stream (See CPRC 38.0-3). [CWRM records indicate that the diversion is actually located on Huelo Stream, tributary to Hanehoi Stream.]

**Photos.** a) Diversion intake structure (EMI, 05/1989); b) Upstream view of Huelo Stream from diversion intake structure (RMT, 10/2007); c) Downstream view from just above diversion intake structure, with intake grate located on right bank of stream (RMT, 10/2007).

a)



b)



c)

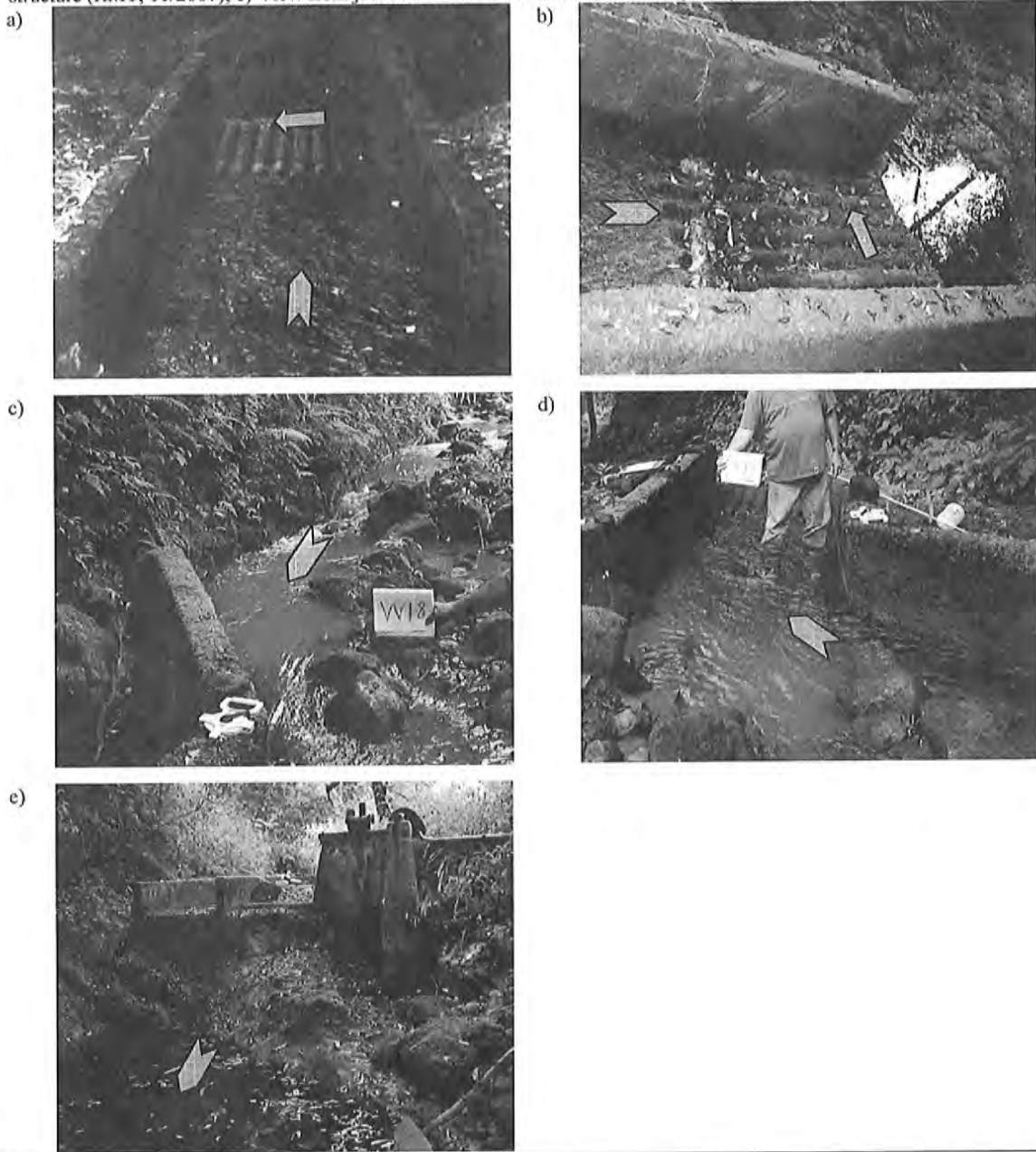


**Table 13-1. Continued. Registered diversions in the Hanehoi hydrologic unit.**

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.191.6	EAST MAUI IRR	2-2-9-014:		Yes	Yes		

Water is diverted from Hanehoi Stream at Intake W-18 (Huelo Intake) into the Wailoa Ditch (tunnel). Registrant identified water use is for municipal (County of Maui), irrigation of approximately 36,000 acres of sugar, pineapple, and a variety of other crops, industrial cooling, manufacturing, and milling, hydroelectric, and livestock. The diversion structure is concrete and has a divertable capacity of 10 mgd. Measurement of total flow of Wailoa Ditch, including this and other intakes, is available from USGS gaging station 16588000 (Wailoa Ditch at Honopou near Huelo).

**Photos.** a) Water flowing into diversion structure (EMI, 05/1989); b) Downstream view of diversion intake structure (DAR, 03/2008); d) Upstream view from diversion structure (RMT, 11/2007); d) Downstream view from just above diversion structure (RMT, 11/2007); e) View from just downstream of diversion structure (DAR, 03/2008).



**Table 13-1.** Continued. Registered diversions in the Hanehoi hydrologic unit.

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.217.6	EAST MAUI IRR	2-2-9-008:		Yes	Yes		

Water is diverted from East Hanehoi Stream at Intake H-3 (Pancho Intake) into the Haiku Ditch (tunnel). Registrant identified water use is for irrigation of approximately 36,000 acres of sugar, industrial manufacturing and milling, and livestock. The diversion structure is concrete and wood, and intake is controllable by wooden gates. The divertable capacity is 5 mgd. Measurement of total flow of Haiku Ditch, including this and other intakes, is available from USGS gaging station 16594000 (Haiku Ditch at Honopou Gulch near Kailua). Declarant noted that an abandoned ditch above the diversion was once used to transport water to a downstream user (user known) for the cultivation of taro

**Photos.** a) Diversion intake structure (EMI, 05/1989); b) Diversion intake structure from left bank (RMT, 10/2007); c) Downstream view from diversion intake structure (RMT, 10/2007).

a)



b)



c)



Table 13-1. Continued. Registered diversions in the Hanehoi hydrologic unit.

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.225.6	EAST MAUI IRR	2-2-9-006:		Yes	Yes		

Water is diverted from West Hanehoi Stream at Intake H-4 (School Intake) into the Haiku Ditch (tunnel). Declarant identified water use is for irrigation of approximately 36,000 acres of sugar, industrial manufacturing and milling, and livestock. The diversion structure is concrete and wood, and intake is controllable by wooden gates. The divertable capacity is 1 mgd. Measurement of total flow of Haiku Ditch, including this and other intakes, is available from USGS gaging station 16594000 (Haiku Ditch at Honopou Gulch near Kailua). Declarant noted that there are two 3.5-inch pipes at the bottom of the intake basin which supply water to downstream users (users unknown) for the cultivation of taro. [CWRM records indicate that the diversion is actually located on Huelo Stream, tributary to Hanehoi Stream.]

**Photos.** a) Diversion intake structure (EMI, 05/1989); b) Diversion intake structure and collection pond from left bank, with some flow allowed to pass through two pipes at foot of pond wall (RMT, 10/2007); c) Stream flows from left to right towards diversion intake (RMT, 10/2007); d) Water flows into ditch intake on left bank (RMT, 10/2007).

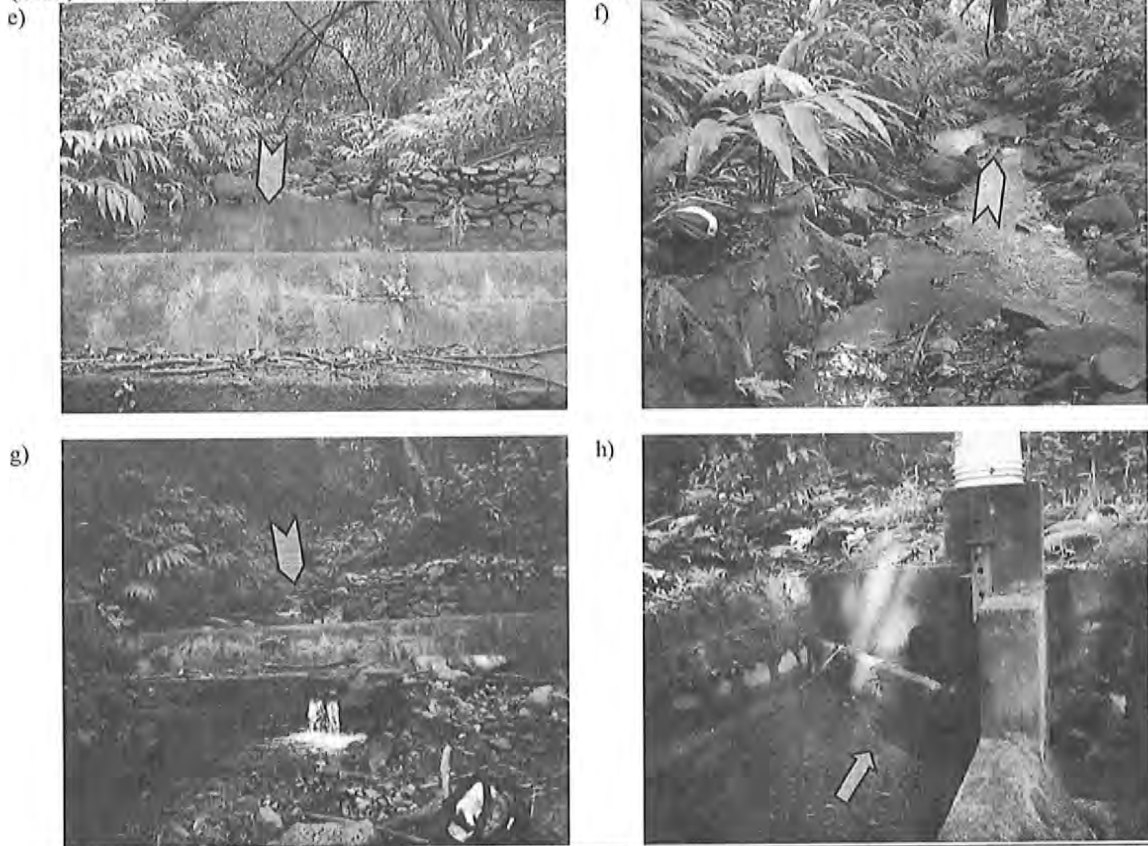


**Table 13-1.** Continued. Registered diversions in the Hanehoi hydrologic unit.

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.225.6	EAST MAUI IRR	2-2-9-006:		Yes	Yes		

(Continued)

**Photos.** e) Upstream view from just below diversion intake structure (RMT, 10/2007); f) Downstream view from diversion intake structure (RMT, 10/2007); g) Upstream view from just below diversion intake structure with two bypass pipes visible (DAR, 01/2008); h) Water flow towards ditch intake behind wall on left bank (DAR, 01/2008).

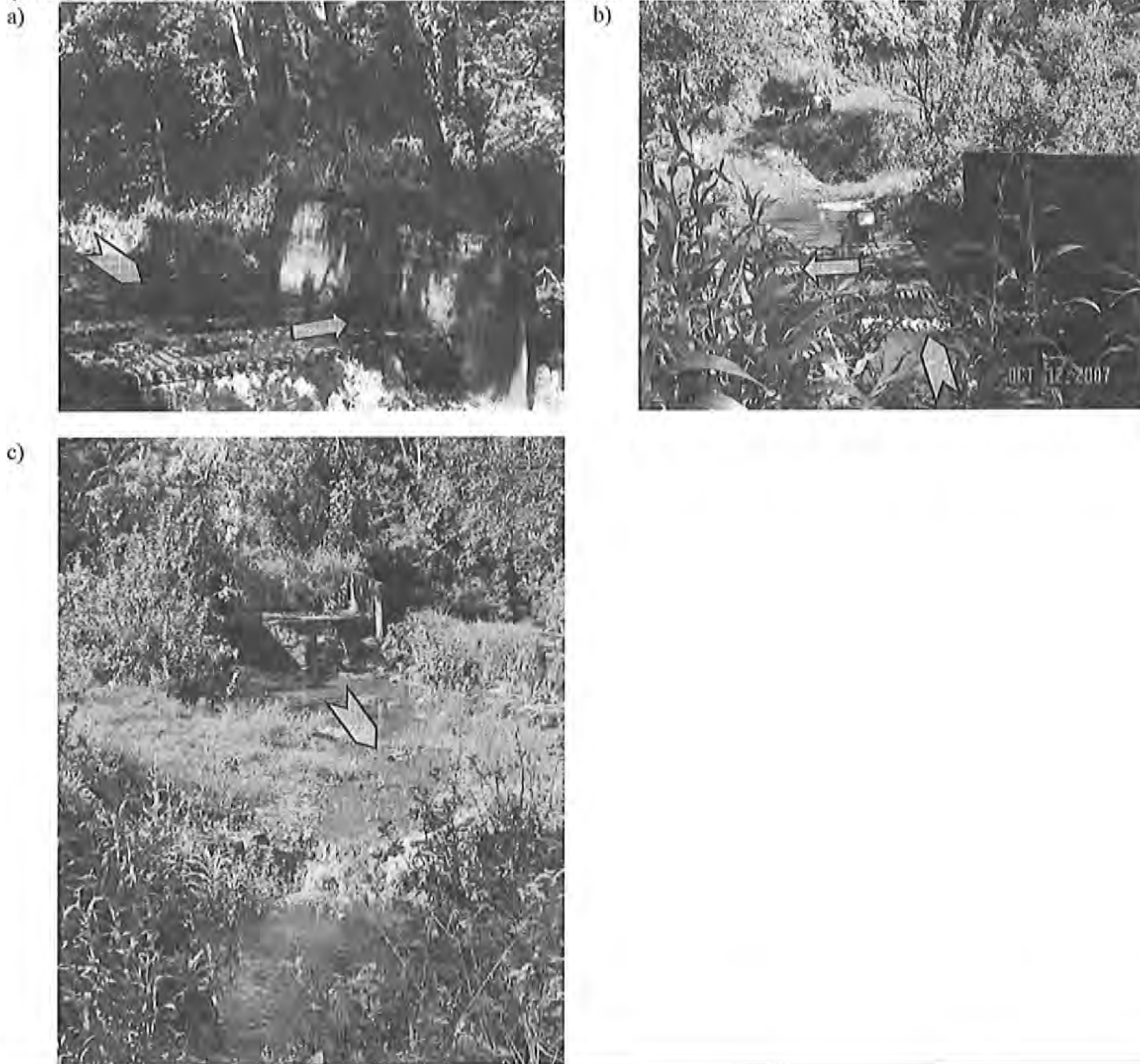


**Table 13-1.** Continued. Registered diversions in the Hanehoi hydrologic unit.

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.240.6	EAST MAUI IRR	2-2-9-009:		Yes	Yes		

Water is diverted from Hanehoi Stream at Intake L-5 (Huelo #1 Intake) into the Lowrie Ditch. Registrant identified water use is for irrigation of approximately 36,000 acres of sugar and pineapple, industrial manufacturing and milling, and livestock. The diversion structure is concrete and has a divertable capacity of 6 mgd. Measurement of total flow of Lowrie Ditch, including this and other intakes, is available from USGS gaging station 16592000 (Lowrie Ditch at Honopou Gulch near Huelo).

**Photos.** a) Diversion intake structure (EMI, 05/1989); b) Downstream view from just above diversion intake structure (RMT, 10/2007); c) Upstream view from downstream of diversion intake structure (RMT, 10/2007).



**Table 13-1.** Continued. Registered diversions in the Hanehoi hydrologic unit.

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.242.6	EAST MAUI IRR	2-2-9-009:		Yes	Yes		

Water is diverted from Hanehoi Stream at Intake L-6 (Huelo #2 Intake) into the Lowrie Ditch. Registrant identified water use is for irrigation of approximately 36,000 acres of sugar and pineapple, industrial manufacturing and milling, and livestock. The diversion structure is concrete and has a divertable capacity of 20 mgd. Measurement of total flow of Lowrie Ditch, including this and other intakes, is available from USGS gaging station 16592000 (Lowrie Ditch at Honopou Gulch near Huelo). Declarant also noted that there is a 2-inch pipe intake above the Lowrie Ditch that provides a domestic water supply to the Huelo community (users unknown). There are also two 3-inch pipes that pass water over the Lowrie Ditch for Kuleana users downstream (users unknown) for the cultivation of taro.

**Photos.** a) Diversion intake structure (EMI, 05/1989); b) Upstream view from diversion intake structure (RMT, 10/2007).

a)



b)

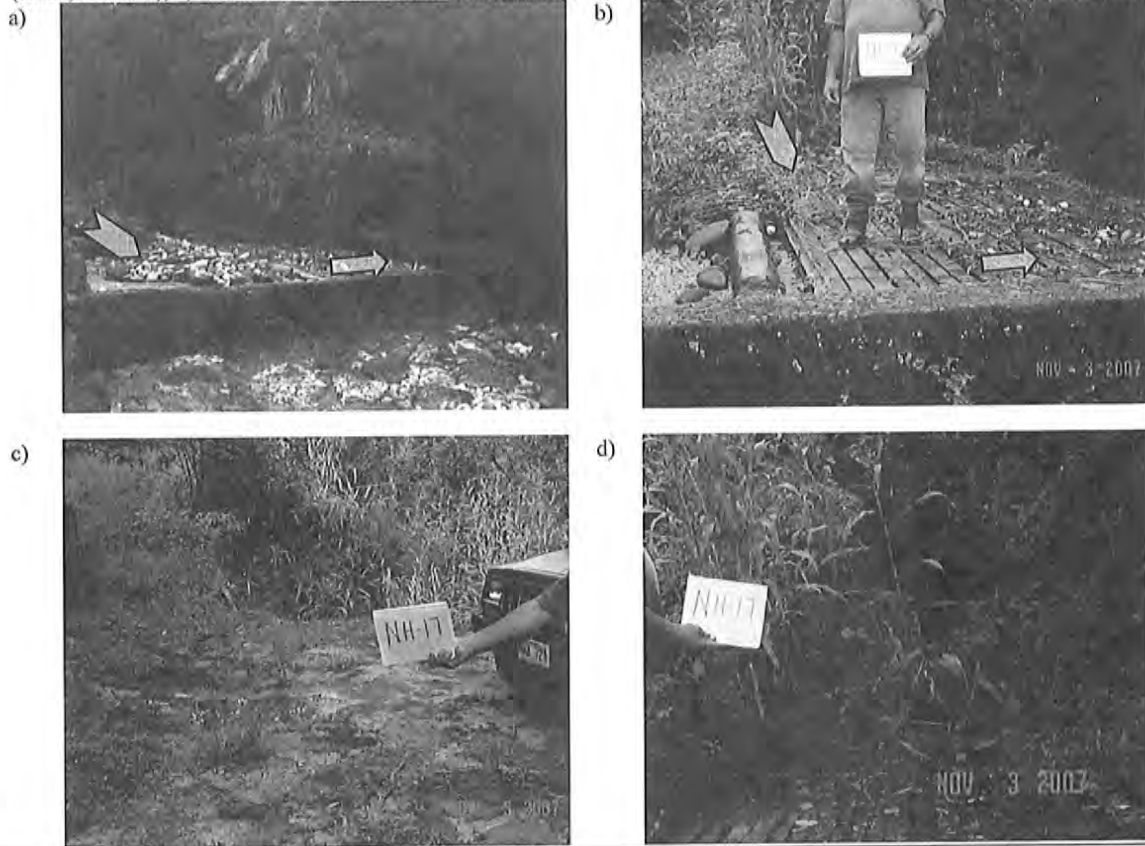


**Table 13-1.** Continued. Registered diversions in the Hanehoi hydrologic unit.

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.264.6	EAST MAUI IRR	2-2-9-014:		Yes	Yes		

Water is diverted from Hanehoi Stream at Intake NH-17 (Huelo Intake) into the New Hamakua Ditch (tunnel). Registrant identified water use is for irrigation of approximately 36,000 acres of sugar, pineapple, and a variety of other crops, industrial manufacturing and milling, and livestock. The diversion structure is concrete and has a divertable capacity of 20 mgd. Measurement of total flow of Wailoa Ditch, including this and other intakes, is available from USGS gaging station 16589000 (New Hamakua Ditch at Honopou near Huelo).

**Photos.** a) Upstream view of diversion intake structure from just below (EMI, 05/1989); b) Diversion intake structure (RMT, 11/2007); c) Downstream view from diversion (RMT, 11/2007); d) Upstream view from diversion (RMT, 11/2007).





**Table 13-1.** Continued. Registered diversions in the Hanehoi hydrologic unit.

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.538.6	KAHIAMOE J&D	2-2-9-014:009	0.00763		Yes	No	Yes

Diversion consists of pipe in Hanehoi Stream. Diversion is ~30' above Lowrie Ditch. Declarant uses a multi-used system with other neighbors: 2" PVC line transports water to 3" PVC then to 22,000 gal tank. Users include domestic (30 houses); irrigation of 10 acres of bananas and landscape; and livestock on TMK 2-2-9-07:007. Water use estimated to range from 3.6 million gallons per year in 1983 to 7.2 million gallons per year in 1987.

Declarant is end user on the pipe from Hanehoi Stream and on an auwai fed by Waipio Iki and Kapalaoa Streams; water is used for domestic supply and for irrigation of ~13.6 acres of taro, banana, flowers, and landscape (TMK 2-2-9-007:035). Use estimated at 4.92 to 8.4 million gallons per year from 1983-1987. Water from same pipe is also used on two additional properties 1) for domestic supply at one connection, irrigation of ~2.6 acres of banana and fruit trees, and watering livestock on TMK 2-9-007:057; and 2) approximately 3.2 acres of landscape on TMK 2-2-9-007:011. Water from an unnamed spring (stream runs through property) is used for domestic supply at one house and for irrigation of approximately 5 acres of landscape on TMK 2-2-9-03:028. Hanehoi Stream is used for watering livestock (TMK 2-2-9-007:004). Declarant claims riparian and appurtenant water rights.

**Photos.** a) Diversion intake structure (CWRM, 01/1994); b) 22,000-gallon storage tank of declarant's property (CWRM, 01/1994).

a)



b)



Table 13-1. Continued. Registered diversions in the Hanchoi hydrologic unit.

Event ID	File Reference	Tax Map Key	Diversion Amount (cfs)	Active (Yes/No)	Verified (Yes/No)	Riparian (Yes/No)	Rights Claim (Yes/No)
REG.662.6	LAPENIA L	2-2-9-008:014			No	Yes	Yes
<p>Diversion is a dirt auwai directly off Puolua Stream (tributary to Hanchoi Stream), irrigating ~ ¼ acres of taro and banana. Declarant claims appurtenant rights.</p>							
REG.663.6	LAPENIA L	2-2-9-008:031			No	Yes	Yes
<p>Diversion is a dirt auwai directly off Huelo Stream (below confluence with Hanchoi Stream), irrigating ~ 1.5 acres of taro and banana. Declarant claims appurtenant rights.</p>							
REG.1002.6	SCHOL D&D	2-2-9-014:001			No	No	No
<p>Diversion consists of a 1 ¼" pipe off Hanchoi Stream with 30 end users. Declarant's uses are one domestic service connection; and irrigation of ~1 acre of banana, lychee, avocado, and ti leaves; and livestock. Declarant's parcel is TMK 2-2-9-014:034.</p>							
REG.1221.6	WITTMAN BL	2-2-9-008:033	0.00254	No	Yes	Yes	No
<p>Diversion from Hanchoi Stream described as a stone, earth, and wood ditch formerly used for irrigating 0.09 acres of taro but land was fallow at time of declaration. Declarant states: "The stream runs around two sides of the property, turning almost 90 degrees. A portion of the flow is diverted across the field and then returned to the stream. Some water is occasionally pumped to storage tanks on TMK 2-9-07:1." CWRM field investigation found no diversion but declarant indicated intention of growing taro in future.</p>							

**Table 13-2.** Minor diversions on the EMI System in the Hanehoi hydrologic unit.

[Source of photos are denoted at the end of each description; CWRM, Commission on Water Resource Management; DAR, Division of Aquatic Resources; EMI, East Maui Irrigation Company, Inc.; RMT, R.M. Towill Cooperation (R.M. Towill conducted field verifications on the island of Maui under contract with the Commission on Water Resource Management in late 2007); Arrows ( $\Rightarrow$ ) generally indicate direction of water flow to, into, and through noninstream diversions; Chevrons ( $\rightrightarrows$ ) generally indicated direction of natural surface water flow]

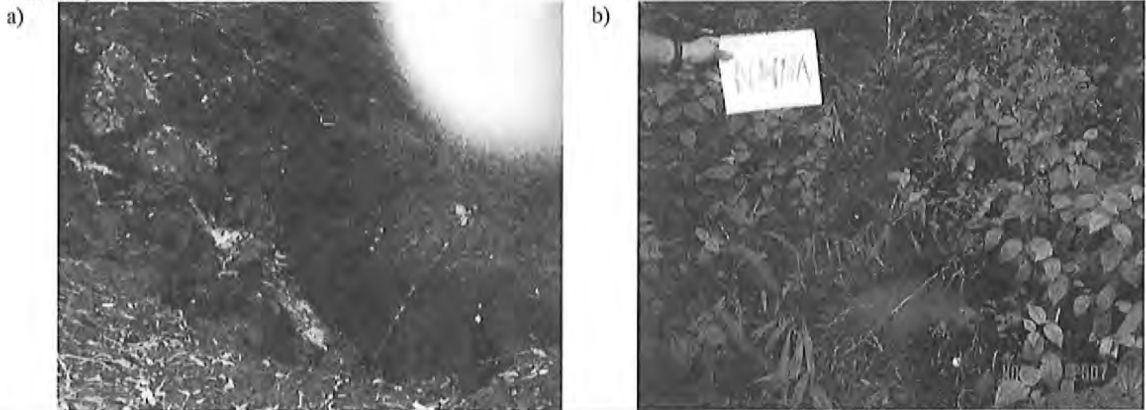
Diversion ID	EMI Ditch System	Description
NH-17a	New Hamakua	West Hanehoi small intake

**Photos.** a) Tributary flow directly into New Hamakua Ditch (EMI, 05/1989); b) Tributary flow into ditch (RMT, 11/2007).



NH-18a      New Hamakua      East Waipio small intake

**Photos.** a) Tributary flows into collection structure (EMI, 05/1989); b) Tributary flow towards collection structure (RMT, 11/2007).



**Table 13-2.** Continued. Minor diversions on the EMI System in the Hanehoi hydrologic unit.





Diversion ID	EMI Ditch System	Description
L-5a	Lowrie	Hanehoi. Stream tributary captured by ditch.
<b>Photos.</b> a) Tributary seeps flow directly into Lowrie Ditch (EMI, 05/1989); b) Tributary flow into ditch (RMT, 10/2007).		
a)		
b)		
L-5b	Lowrie	Hanehoi. Stream tributary captured by ditch.
<b>Photos.</b> a) Tributary seeps flow directly into Lowrie Ditch (EMI, 05/1989); b) Tributary flow into ditch (RMT, 10/2007).		
a)		
b)		

Table 13-2. Continued. Minor diversions on the EMI System in the Hanehoi hydrologic unit.

Diversion ID	EMI Ditch System	Description
L-5c	Lowrie	Hanehoi. Stream tributary captured by ditch.

Photos. a) Tributary seeps flow directly into Lowrie Ditch (EMI, 05/1989).

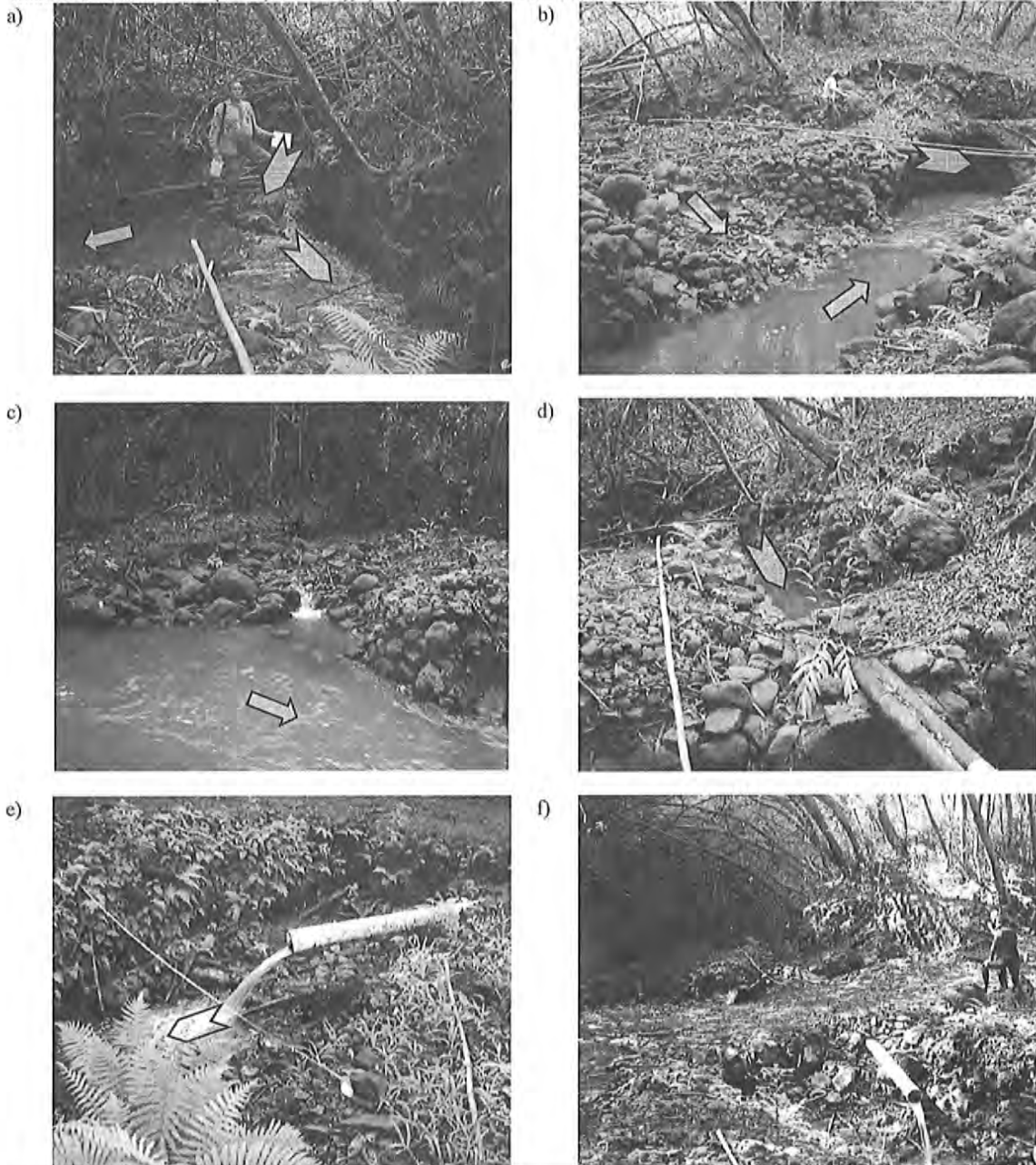
a)



**Table 13-2.** Continued. Minor diversions on the EMI System in the Hanehoi hydrologic unit.

Diversion ID	EMI Ditch System	Description
L-7a	Lowrie	Hanehoi (Roseapple intake)

**Photos.** a) Looking upstream from diversion L-7a, water flowing towards bottom right goes into two PVC pipes to carry water over and across Lowrie Ditch, and water flowing towards left of picture is the natural stream channel flowing directly into Lowrie Ditch (RMT, 10/2007); b) Two pipes are located just above Lowrie Ditch tunnel opening (DAR, 03/2008); c) Water flowing directly into Lowrie Ditch (DAR, 03/2008); d) Channel on left bank directs water into two pipes to flow across Lowrie Ditch (DAR, 03/2008); e) Two pipes upstream connect to a single pipes that drops water back into the stream channel below the ditch (DAR, 03/2008); f) Upstream view from below diversion intake (DAR, 03/2008).



**Table 13-2.** Continued. Minor diversions on the EMI System in the Hanehoi hydrologic unit.

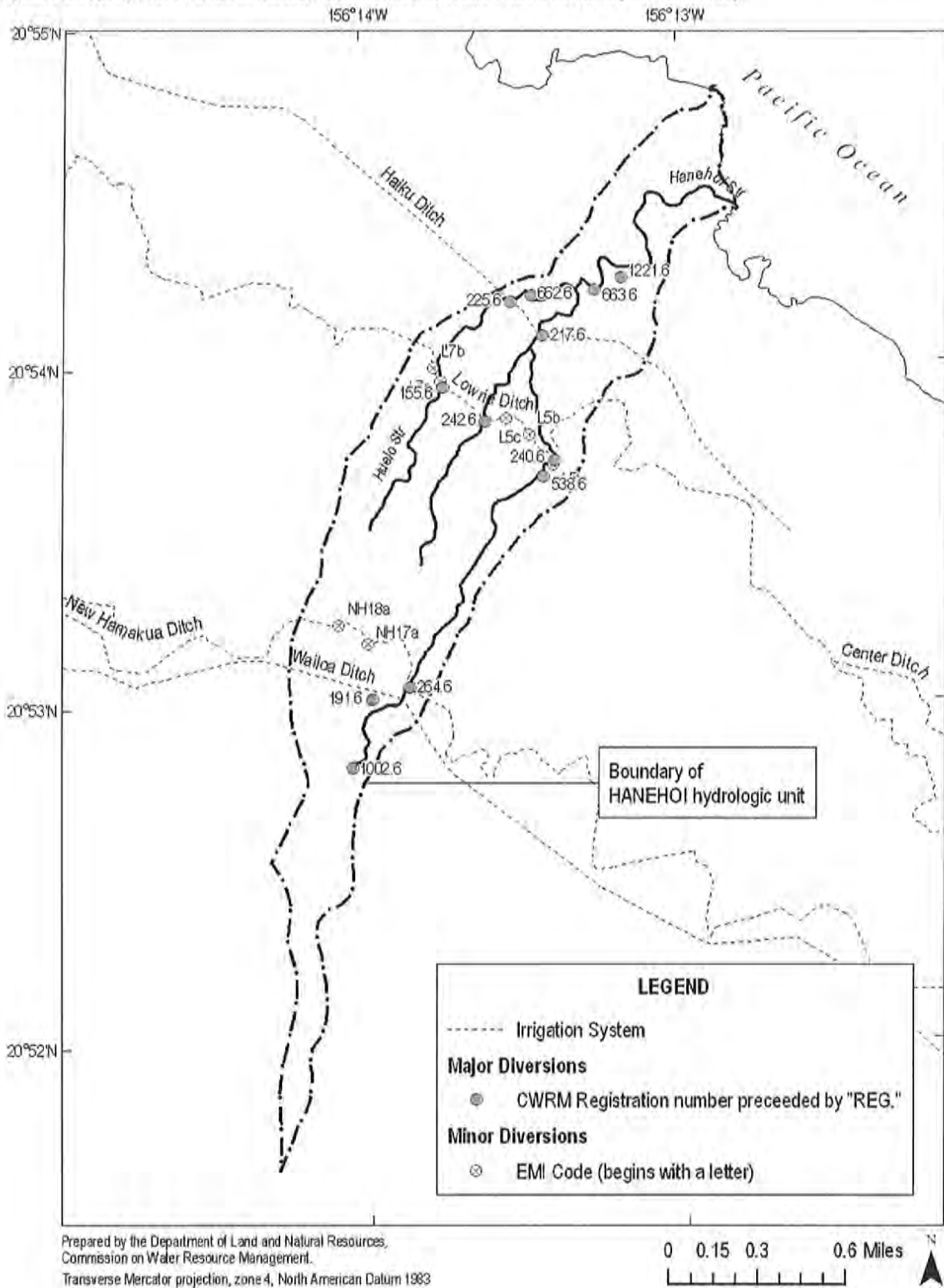
Diversion ID	EMI Ditch System	Description
L-7b	Lowrie	West Hanehoi. Stream tributary captured by ditch.

**Photos.** a) Tributary seeps flow directly into Lowrie Ditch (EMI, 05/1989); b) Tributary flow into ditch (RMT, 10/2007); c) Downstream view of Lowrie Ditch from tributary inflow (RMT, 10/2007).



Following the establishment of instream flow standards, one of the proposed measures to increase streamflow may be to decrease the amount of water diverted from streams. Such a measure has important implications to ground water recharge because it affects the amount of water available for irrigation. Decreasing the amount of water diverted at the ditches located in east Maui affects the amount of water available for the irrigation of crops in west and central Maui. Since the early 20th century, about 100 billion gallons of water (274 million gallons per day) have been diverted each year from Maui streams for irrigation in west and central Maui. More than half of this diverted water, 59 billion gallons per year (162 million gallons per day), comes from east Maui (Engott and Vana, 2007).

**Figure 13-9.** All registered diversions and EMI minor diversions identified in the Hanehoi hydrologic unit (Source: East Maui Irrigation Company, 1970; State of Hawaii, Commission on Water Resource Management, 2008e).



Prepared by the Department of Land and Natural Resources,  
 Commission on Water Resource Management.  
 Transverse Mercator projection, zone 4, North American Datum 1983







The Title Insurance Commitment is a legal contract between you and the company. It is issued to show the basis on which we will issue a Title Insurance Policy to you. The Policy will insure you against certain risks to the land title, subject to the limitations shown in the Policy.

The Company will give you a sample of the Policy form, if you ask.

The Commitment is based on the land title as of the Commitment Date. Any changes in the land title or the transaction may affect the Commitment and the Policy.

The Commitment is subject to its Requirements, Exceptions and Conditions.

THIS INFORMATION IS NOT PART OF THE TITLE INSURANCE COMMITMENT.

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SCHEDULE B-1 — Requirements	3
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CONDITIONS	other side of 1

**YOU SHOULD READ THE COMMITMENT VERY CAREFULLY.**

If you have any questions about the Commitment, please contact the issuing office.

**EXHIBIT E-33**

A. LEASE

Lessor: Kaili Kaea Lee, no marital status  
Lessee: Haiku Fruit & Packing Co., Ltd.  
Dated: August 13, 1926  
Recorded: August 30, 1926  
Book: 839  
Page: 231  
Leases: all that certain piece or parcel of land  
situate at Hanehoi, Hamakualoa, County  
aforesaid, containing an area of Fourteen  
(14) acres, being the portion of Grant  
1080 to Puha remaining after reserving  
the house lot therefrom.  
Term: For and during the term of Ten (10) years  
(or Two Cycles of Pineapple crops)

NOTES:

1. Records at said Bureau of Conveyances fail to disclose further transfer(s) and/or conveyance(s) under the name(s) of KAILI KAEA, KAILI ELIZABETH KAEA, ELIZABETH FUKUMOTO, ELIZABETH RHEE and/or KAILI KAEA LEE, affecting the land herein described.
2. The following is given for informational purposes only and was abstracted from the records of The Office of Health, Status, Monitoring of the Department of Health, of the State of Hawaii:  
  
The death of one ELIZABETH KAEA LEE on or about August 19, 1955. Her birthdate was shown to be September 16, 1885 and her father was shown to be James Kaea and her mother was unknown. She was the wife of one Chill Sun Lee who was deceased at the time of her death. The informant was shown to be Solomon Lee. (Register No. 2147).
3. Records at the Hawaii Supreme Court and the First and Second Circuit Courts, fail to disclose a Probate(s) and/or Judicial Determination of Heirs under the name(s) of KAILI KAEA, KAILI ELIZABETH KAEA, ELIZABETH FUKUMOTO, ELIZABETH RHEE and/or KAILI KAEA LEE, affecting the land herein described.



STATE OF HAWAII  
COMMISSION ON WATER RESOURCE MANAGEMENT  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER RESOURCE MANAGEMENT

REGISTRATION OF STREAM DIVERSION WORKS  
AND  
DECLARATION OF WATER USE

INSTRUCTIONS: Please type or print. If information is not available or not applicable, indicate as N/A. Fill out as completely as possible, sign, and mail form to the Division of Water Resource Management, P.O. Box 373, Honolulu, Hawaii 96809. Phone 548-3948 or 548-7543 for assistance.

MULTI-SOURCE SYSTEMS: For a system of two or more diversion structures, submit a single package to describe the complete system. Include a single location map (or a set of maps if required) showing all diversion structures and measurement points, and a separate copy of this form for each structure and measurement point. On forms describing diversion structures, complete parts A, B, D, and E. On forms describing measurement points, complete parts A, B, and F.

STREAM NAME: Hanehoi #1 ISLAND: \_\_\_\_\_  
DIVERSION STRUCTURE NAME: \_\_\_\_\_  
DIVERSION SYSTEM NAME: \_\_\_\_\_

A. DIVERSION WORKS OPERATOR

Firm name: \_\_\_\_\_  
Contact person: \_\_\_\_\_  
Address: \_\_\_\_\_  
Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

B. OWNER OF DIVERSION WORKS SITE

Firm name: Karli Kaea Lee  
Contact person: Solomon Lee Sr.  
Address: 357 Waiale Rd.  
Waialeale  
Zip: 96799 Phone: 299-7306

C. STREAM DIVERSION LOCATION

Tax Map Key: 29-08-7 Town, Place, District: Huelo, Mo'oi  
Attach USGS "Quad" map (scale 1:24,000), tax map, or other map showing the diversion location.

D. STREAM DATA

Streamflow at diversion site is:  Perennial (Water is always flowing)  Intermittent (Channel is sometimes dry)  
Is streamflow gaged?  Yes  No  
If yes, provide gage name, and show location on map. Name: \_\_\_\_\_  
Average flow before diversion: Unknown  mgd  gpm  cfs

E. DIVERSION STRUCTURE DATA

Year constructed: 1850 approx Elevation (above sea level): Unknown  
Diversion structure is:  Concrete  Wood  Pipe  Other (Describe): Natural - Rock/mud  
Diverted flow is:  Controlled  Uncontrolled  
Divertable capacity is: Unknown  mgd  gpm  cfs

Submit an "as-built" drawing and dated photograph of the diversion works, if available.

... (continued over)

For Official Use Only:

Date received: \_\_\_\_\_ Date accepted: \_\_\_\_\_  
Field checked by: \_\_\_\_\_ Date: \_\_\_\_\_ Latitude: \_\_\_\_\_ Hydrologic Unit: \_\_\_\_\_  
Comments: \_\_\_\_\_ Longitude: \_\_\_\_\_ State Diversion No.: \_\_\_\_\_

EXHIBIT E-34 "A"

# Hanehoi Stream # 1

## SUPPLEMENTAL DECLARATION FOR ALL OWNERS OR USERS OF WATER

2-9-08-7 TMK

1. The following statement is in my own words and describes the basis of the evidence that allows me to lay claim to these water rights or uses: (identify type of evidence, witnesses, past use, projected use and any changes if applicable; when complete attach this form to the State of Hawaii Declaration of Water Use form that is applicable)

During the years 1928 thru 1940 plus, we raised water for these Taro patches

again there was some problem w/ east Maui Irrigation Co where my mother's water was not fully received. - she claims she had 1.3' of water rights

2. I did or did not receive notice from the State of Hawaii Commission on Water Resource Management regarding the registration and declaration of water use.

3. I declare that the contents of the above Supplemental Declaration of Water Use are the truth to the best of my knowledge.

Water User's Signature: Solomon Lee Sr  
Printed Name: Solomon Lee Sr

Date: 5-24-89

AUTHORIZATION FOR NATIVE HAWAIIAN ADVISORY COUNCIL, INC. TO FILE

May 25, 1989

To whom it may concern:

I hereby authorize the Native Hawaiian Advisory Council, Inc. and its agents to assist me in filing my water use declaration. If I complete my declaration by phone or am otherwise not able to sign my declaration form, I authorize the Native Hawaiian Advisory Council, Inc. and its agents to sign and submit my declaration form for me.

A dated and signed photocopy of this authorization will have the same force and effect as an original.

Solomon Lee Sr.  
(please sign your name)

SOLOMON LEE SR  
(please print your name)

357 Waiale Rd.

Wai Hi 96793

Address



STATE OF HAWAII  
 COMMISSION ON WATER RESOURCE MANAGEMENT  
 DEPARTMENT OF LAND AND NATURAL RESOURCES  
 DIVISION OF WATER RESOURCE MANAGEMENT

REGISTRATION OF STREAM DIVERSION WORKS  
 AND  
 DECLARATION OF WATER USE

**INSTRUCTIONS:** Please type or print. If information is not available or not applicable, indicate as N/A. Fill out as completely as possible, sign, and mail form to the Division of Water Resource Management, P.O. Box 373, Honolulu, Hawaii 96809. Phone 548-3848 or 548-7543 for assistance.

**MULTI-SOURCE SYSTEMS:** For a system of two or more diversion structures, submit a single package to describe the complete system. Include a single location map (or a set of maps if required) showing all diversion structures and measurement points, and a separate copy of this form for each structure and measurement point. On forms describing diversion structures, complete parts A, B, D, and E. On forms describing measurement points, complete parts A, B, and F.

STREAM NAME: Hanehoi #2 ISLAND: Mau  
 DIVERSION STRUCTURE NAME: Unk  
 DIVERSION SYSTEM NAME: Unk

**A. DIVERSION WORKS OPERATOR**

Firm name: \_\_\_\_\_  
 Contact person: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

**B. OWNER OF DIVERSION WORKS SITE**

Firm name: Kaili Kapa Lee  
 Contact person: Salmon Lee Jr.  
 Address: 357 Waiale Rd.  
Waituku  
 Zip: 96793 Phone: 244-7306

**C. STREAM DIVERSION LOCATION**

Tax Map Key: 2-9-08-35 Town, Place, District: Huelo, Mau  
 Attach USGS "Quad" map (scale 1:24,000), tax map, or other map showing the diversion location.

**D. STREAM DATA**

Streamflow at diversion site is:  Perennial (Water is always flowing)  Intermittent (Channel is sometimes dry)  
 Is streamflow gaged?  Yes  No  
 If yes, provide gage name, and show location on map. Name: \_\_\_\_\_  
 Average flow before diversion: Unknown  mgd  gpm  cfs

**E. DIVERSION STRUCTURE DATA**

Year constructed: 1850 approx. Elevation (above mean sea level): Unknown  
 Diversion structure is:  Concrete  Wood  Pipe  Other (Describe): Natural - Rock/ Mud  
 Diverted flow is:  Controlled  Uncontrolled  
 Divertable capacity is: Unknown  mgd  gpm  cfs

Submit an "as-built" drawing and dated photograph of the diversion works, if available.

... (continued over)

**For Official Use Only:**

Date received: \_\_\_\_\_ Date accepted: \_\_\_\_\_ Hydrologic Unit: \_\_\_\_\_  
 Field checked by: \_\_\_\_\_ Date: \_\_\_\_\_ Latitude: \_\_\_\_\_ State Diversion No.: \_\_\_\_\_  
 Comments: \_\_\_\_\_ Longitude: \_\_\_\_\_

**EXHIBIT E-34 "B"**

Hanehoi Stream #2

SUPPLEMENTAL DECLARATION  
FOR ALL OWNERS OR USERS OF WATER

2-9-08-35

JMK 2-9-08-35

1. The following statement is in my own words and describes the basis of the evidence that allows me to lay claim to these water rights or uses: (identify type of evidence, witnesses, past use, projected use and any changes if applicable; when complete attach this form to the State of Hawaii Declaration of Water Use form that is applicable)

In short period of time we intermittently planted Banana plants & some taro plant on parcel 2-9-08-35

2. I  did or  did not receive notice from the State of Hawaii Commission on Water Resource Management regarding the registration and declaration of water use.

3. I declare that the contents of the above Supplemental Declaration of Water Use are the truth to the best of my knowledge.

Water User's Signature: Solomon Lee Sr Date: 5-24-89  
Printed Name: Solomon Lee Sr





STATE OF HAWAII  
 COMMISSION ON WATER RESOURCE MANAGEMENT  
 DEPARTMENT OF LAND AND NATURAL RESOURCES  
 DIVISION OF WATER RESOURCE MANAGEMENT

REGISTRATION OF STREAM DIVERSION WORKS  
 AND  
 DECLARATION OF WATER USE

INSTRUCTIONS: Please type or print. If information is not available or not applicable, indicate as N/A. Fill out as completely as possible, sign, and mail form to the Division of Water Resource Management, P.O. Box 373, Honolulu, Hawaii 96809. Phone 548-3948 or 548-7543 for assistance.

MULTI-SOURCE SYSTEMS: For a system of two or more diversion structures, submit a single package to describe the complete system. Include a single location map (or a set of maps if required) showing all diversion structures and measurement points, and a separate copy of this form for each structure and measurement point. On forms describing diversion structures, complete parts A, B, D, and E. On forms describing measurement points, complete parts A, B, and F.

STREAM NAME: Hanehau #3 ISLAND: Mau  
 DIVERSION STRUCTURE NAME: unknown  
 DIVERSION SYSTEM NAME: unknown

A. DIVERSION WORKS OPERATOR  
 Firm name: John B. Akiu  
 Contact person: John B. Akiu  
 Address: \_\_\_\_\_  
 Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

B. OWNER OF DIVERSION WORKS SITE  
 Firm name: Kaiti Kaen Lee  
 Contact person: Salomon Lee Sr.  
 Address: 357 Waiale Rd.  
Waialeale  
 Zip: 96793 Phone: 244-7306

C. STREAM DIVERSION LOCATION  
 Tax Map Key: 2-9-08-34 Town, Place, District: Huelo, Mau  
 Attach USGS "Quad" map (scale 1:24,000), tax map, or other map showing the diversion location.

D. STREAM DATA  
 Streamflow at diversion site is:  Perennial (Water is always flowing)  Intermittent (Channel is sometimes dry)  
 Is streamflow gaged?  Yes  No  
 If yes, provide gage name, and show location on map. Name: \_\_\_\_\_  
 Average flow before diversion: Unknown  mgd  gpm  cfs

E. DIVERSION STRUCTURE DATA  
 Year constructed: 1850 approx Elevation (Above mean sea level): unknown  
 Diversion structure is:  Concrete  Wood  Pipe  Other (Describe): Natural Rock + mud  
 Diverted flow is:  Controlled  Uncontrolled  
 Divertable capacity is: unknown  mgd  gpm  cfs

EXHIBIT E-34"C"

Submit an "as-built" drawing and dated photograph of the diversion works, if available.

Hanehau Stream #3

**SUPPLEMENTAL DECLARATION  
FOR ALL OWNERS OR USERS OF WATER**

2-9-08-34 TMK

1. The following statement is in my own words and describes the basis of the evidence that allows me to lay claim to these water rights or uses: (identify type of evidence, witnesses, past use, projected use and any changes if applicable; when complete attach this form to the State of Hawaii Declaration of Water Use form that is applicable)

Water taken from stream flow, then added to  
flow in stream land 2-9-08-34,  
wife living on the property my mother said she  
had 3<sup>rd</sup> of water rights

2. I  did or  did not receive notice from the State of Hawaii Commission on Water Resource Management regarding the registration and declaration of water use.

3. I declare that the contents of the above Supplemental Declaration of Water Use are the truth to the best of my knowledge.

Water User's Signature: Solomon Lee Sr. Date: 5/24/89  
Printed Name: SOLOMON Lee SR.



SCOTT K. TERUYA  
Administrator

GERY MADRIAGA  
Assistant Administrator

COUNTY OF MAUI  
DEPARTMENT OF FINANCE  
REAL PROPERTY TAX DIVISION

September 25, 2009

LEE, KAILI K  
46A KUPEE PL  
MAKAWAO HI 96768-8520

Re: TMK (2) 290080340000  
HUELO

The above-referenced property received an agricultural use assessment in 2009.

Agriculture use as defined by the Rules and Regulation of the Director of Finance relating to the assessment of agricultural lands under Maui County Code Section 3.48.325 "...shall mean lands actually put to agricultural use adhering to acceptable standards to produce crop, specific livestock, including ranching use. Actually put to agricultural use shall deemed to be when crops are actually in cultivation and farm management efforts such as weed or pruning control, plowing, including housing, fencing and water facilities for livestock and pasturing of animals are **clearly evident**. It does not include nor apply to areas used primarily as yard space, setbacks or open landscape associated with residential use planted with fruit and ornamental trees, flowers and vegetables primarily for home use."

As part of our ongoing efforts to uniformly and equitably assess property at their fair market value, the Real Property Tax Division is requiring that you file for the agricultural activity on this parcel. The required Request for Agriculture Use Valuation form and instructions are enclosed and are also available at our website [www.mauipropertytax.com](http://www.mauipropertytax.com). Access to the related Maui County Codes and the Rules and Regulations are also available on the website. A site inspection may be made to verify the agricultural use.

**Please return completed required form(s) enclosed to determine the agricultural use valuation for the 2010 assessment year. If we do not receive your agriculture use request within 30 days of this notice, your agricultural use assessment will be discontinued and may result in a substantial difference in your real property taxes.**

Should you have any questions, please feel free to contact our office at (808) 270-7297.

Sincerely,

Scott Wells  
Real Property Tax Appraiser

Enclosures

December 10, 2009

Mr. Scott Wells  
Real Property Tax Appraiser  
County of Maui, Dept. Of Finance  
Real Property Tax Division  
70 E. Kaahumanu Avenue, Suite A-16  
Kahului, Maui, HI 96732-7297

Re: TMK (2) 290080340000  
(2) 290080350000  
(2) 290080070000

Dear Mr. Wells,

My name is Solomon Lee Jr and I am the legal Executor for the estate of the deceased Solomon Lee, Sr., and his mother (my grandmother) who was Kaili Kaea Lee who died in 1956.

The three properties referred to above is all located in Huelo. I had some concerns upon receiving the notices from the Real Property Tax Department and, if you recall, we talked on the phone on the matter. Thank you for helping me understand what was required of the property owners in regarding real property taxes assessments.

At the present time 290080340000 (15.12 acres) sits idle after four acres had been cleared of it's heavy growth. The rest of the property consist of gulches. The last three years I was farming cleared area raising Hawaiian chili peppers, bananas, and tropical flowers. Along with this, we harvested the guavas, lilikoi, strawberry guavas, lime, tangerines, and ferns shoots that grow wild throughout the property. I also sold over a hundred young coconut trees.

Problem with farming this parcel as well as trying to farm the other two parcels, is that although there is a stream (Hanehoi Stream) that runs through the makai end of this property, both EMI and DLNR won't allow us to draw water from the stream for farming.

The farming I did on this land depended on rainfall. Last year (9008) my health became a major factor and, with the economy the way it is, I gave up farming this year. I am submitting some photos of this property for your viewing. Without water, very little and limited farming can be done in the future. As for farm animals, I will have to truck water in and that is not feasible.

Please notice that although Hanehoi Stream runs through and next to all three properties concerned, there is no water that runs though that stream except when it rains heavy in the area

January 11, 2012

Mr. Robert K. Chong, Planner  
State of Hawaii  
Commission on Water Resource Management  
Department of Land and Natural Resources  
Division of Water Resource Management

RE: Registration of Stream Diversion Works and Declaration of Water use  
Form 8810-2 (first 8 could be a 6, printing on form is not clear).

Solomon Lee, Jr.  
46-A Kupee Place  
Pukalani, Maui, HI 96768

Dear Mr. Chong.

In 1985 at the request of the State and your department, land owners were asked to file Form 8810-2. Tanaka Engineers Inc. on Maui was either commissioned or contracted by the State to meet with those land owners that filed Form 8810-2.

Three forms were submitted by father for three parcels in Huelo in regards to water usages of Hanehoi Stream that runs next to, and on the family parcels. These parcels are listed under TMK 2-9-08-7, 2-9-08-34 and 2-9-08-35. Mr. Tanaka and I met on site in Huelo. He asked questions regarding Hanehoi Stream which I responded to and in my presence, he recorded the flow of water on Hanehoi Stream. A copy of his report was never given to my father (Solomon Lee, Sr), myself, or any member of our family.

I am requesting a copy of his report for our records (I am the Trustee of my father's will) from the State. I did call and requested a copy from Tanaka Engineers Inc., but was informed that the report was done for the State of Hawaii and the copy had to come from the State (your office). Appreciate your assistance in this matter.

Sincerely,

  
Solomon Lee, Jr.

**EXHIBIT** E-36

and in the mountain areas above Huelo. EMI took the water flowing in this stream and enter it into the Haiku Ditch. My grandmother who was taro farming all three properties, had no water to farm the properties. She filed a complaint with EMI and with the Territory of Hawaii in the 1940s and early 50s but to no avail.

The water that runs through the lower property on Hanehoi stream comes through the Puolua stream that EMI controls and is required to release due to Water Rights given to property owners in that area.. Even as this letter is being written, there are legal issues being address concerning this stream and the rights of other property owners in the Huelo area..

The other two properties, 07000 and 35000, are over grown with heavy terrain and large trees which were once taro patches. There are no roads leading to this properties which is surrounded by East Maui Irrigation properties. I have asked EMI for a land exchange, offering these two properties for an equal acreage bordering 34000 and they have turned this offer down, stating that they do not consider land exchanges.

I am submitting photos that will hopefully give you some sort of an idea of the terrain that is involved. It's impossible to take any clear photos of 07000 and 35000 on the properties due to heavy growth on both properties. I am also submitting a copy of the TMK and have highlighted the parcels involved. Listed on the back of each photo is the area I was standing on when the photo was taken and the direction.

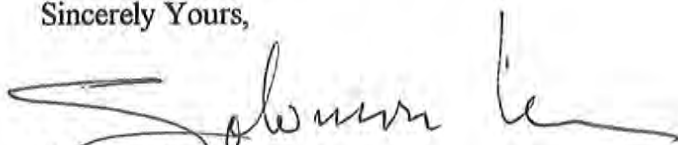
It is difficult to explain what the situation is really like concerning parcels 07000 and 34000 and I welcome a site inspection to help with the proper assessment concerning these properties.

At this time, all three parcels are not in agricultural use as defined by the County. It is not by choice by me or my family. Water is a problem and I have no access to it other than the rain that falls on the property. No one knows better than the County of Maui, the water problems facing all areas on the county.

I appreciate any consideration given to me and my family in the assessment of our properties. The water that we once used to farm our land was diverted (taken away from the stream we used) and now we may be paying higher taxes because we are not able to farm the land? I hope and pray not.

If there is any thing that I may further help with in this assessment, please contact me at 573-0676 or cell 281-5690 or 344-6827.

Sincerely Yours,



Solomon Lee, Jr.

Mission Statement for Hale Akua Farms  
by Lorraine L. "Lori" Grace

December 24, 2014

Hale Akua Garden Farm and Agricultural Education Center in Huelo is managed by the non-profit group, Sunrise Center.

Our mission at Hale Akua Farms is to build a holistic organic system to produce a great bounty of fruits and vegetables, healthy livestock rotations, and to consistently improve our soil, while developing and sharing biologically sound agricultural techniques. To accomplish this we have created a Certified Organic Farm and Permaculture-inspired Food Forest on our seven acres of land. We have designed this farm not only to produce wholesome, nutrient rich food, but also to offer others the opportunity to learn about sustainable and productive agricultural techniques and practices.

To better fulfill our mission, our Agricultural Education Center has hosted experts and classes in a wide variety of agriculturally related topics, and as part of our work we welcome groups from local schools and colleges to tour our farm and to use the facilities for classes. Our goal is to bring people to the land to learn and we have fully permitted accommodations where visiting groups can stay on the land during the workshops and classes, a plus for many teachers who design their courses for a location-based curriculum.

Another part of our mission is our outreach to the general educational community. Hale Akua has had an ongoing partnership with UH Maui College to offer hands-on agricultural learning experiences on the farm to UH classes. We have begun to offer the same opportunities to out of state colleges as well.

Our mission is very land centered and we have an ongoing ag Intern training program that draws participants from Maui and all over the world, who come to live, learn and work on the farm. We are committed to not just grow healthy food, but to help distribute it right here in our own neighborhood, as well as through health food stores, farmer's markets and other businesses.

Part of Hale Akua Farms' kuleana centers around restoration. This includes land and water. Our mission includes working to restore mauka-makai stream flows of Hanehoi and Puolua streams in Huelo where our farm is located. Our farm is committed, as part of its mission, to provide support for other farms to restore the traditional practice of kalo (taro) growing along Huelo's streams when there is sufficient water available in our valley.

We are also committed to expanding our ongoing organic farm best practices research to better understand how to build healthier soils that naturally help crops resist pests and develop innovative techniques to farm better with less effort and healthy results.

We have supported watershed education and improvement projects in the Huelo area for many years, such as the first citizen-based botanical survey of Hanehoi Stream and pilot projects to clear the steam beds of debris and enhance stream flows and water quality. We are committed to

EXHIBIT E-37

We are also committed to expanding our ongoing organic farm best practices research to better understand how to build healthier soils that naturally help crops resist pests and develop innovative techniques to farm better with less effort and healthy results.

We have supported watershed education and improvement projects in the Huelo area for many years, such as the first citizen-based botanical survey of Hanehoi Stream and pilot projects to clear the stream beds of debris and enhance stream flows and water quality. We are committed to play a role in the revival of a viable agricultural economy in communities like Huelo, based on Hawaiian agricultural practices and traditions.

As the owner of Hale Akua Farm and Agricultural Education Center, and as President of Sunrise Center, I fully support our Hale Akua Farm Land Manager Michael D'Addario representing the farm and center during the East Maui Stream Flow contested case hearing at the State Water Commission.

Mahalo for this opportunity to share our work.

Lorraine L. "Lori" Grace

 date 12-29-14

signature



LAND COURT

REGULAR SYSTEM

After recordation, return by Mail [ ] Pickup [ X ]

Stephen H. Reese, Esq.  
1000 Bishop Street, Suite 908  
Honolulu, Hawaii 96813

Pages:

Title of Document:

Warranty Deed

Tax Map Key: (2) 2-9-007-056

Located at: Lot 1B, Kahiamoe-Pitt Subdivision, Maui, Hawaii

### Warranty Deed

This Deed, made this 29 day of July, 1997, by <sup>Play A</sup> **Lorraine L. Grace**, wife of David P. Charry, whose residence and mailing address is 6 ~~Plia~~ Verde, Tiburon, California 94940, hereinafter called the "Grantor", and **Hale Akua Shangri-la**, a Hawaii corporation, having its principal place of business and post office address at Star Route 1, Box 161, Haiku, Hawaii 96708, hereinafter called the "Grantee".

CG.  
psh

**EXHIBIT** E-38

ORIGINAL

Recordation Requested By:

89 37551

STATE OF HAWAII  
BUREAU OF LAND & NATURAL RESOURCES  
RECEIVED FOR RECORD

After Recordation, Return To:

David Grace - Charr  
118-38-7951  
Star Route One Box 161  
Haiku Maui HI 96708

MAR 20 AM 8:01  
22965 194  
W. K. VIOLA, REGISTRAR

Return By: Mail  Pick-Up

Requestor To Fill Above

Space Above This Line For Registrar's Use

TMK: (II)

DEED

DEED dated March 7, 1989, between DAVID P. CHARRY and LORRAINE L. GRACE, husband and wife, of Haiku, Maui, Hawaii, hereinafter called "Grantor", for good and sufficient consideration to them paid by LORRAINE L. GRACE, wife of David P. Charry, whose residence and post office address is Star Route 1, Box 161, Haiku, Maui, Hawaii 96708, hereinafter called "Grantee", the receipt of which is hereby acknowledged, does hereby grant, bargain, sell and convey to Grantee, in the tenancy hereinafter described, the property described on Exhibit "A" attached hereto and made a part hereof.

AND the reversions, remainders, rents, issues and profits thereof, and all of the estate, right, title and interest of Grantor, both at law and in equity, therein and thereto.

TO HAVE AND TO HOLD the same, together with all buildings, improvements, rights, easements, privileges and appurtenances thereon and thereto belonging or appertaining or held and enjoyed therewith to Grantee, and her heirs, devisees, personal

CONVEYANCE  
HAWAII  
TAX  
10000

GUY T. MOEN  
ATTORNEY AT LAW  
1975 VINEYARD STREET, #102  
WAILUKU, HAWAII 96793  
TELEPHONE 244-7617

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1 representatives, successors and assigns.

2 AND Grantor does hereby covenant and agree with Grantee  
3 that Grantor is lawfully seized in fee simple of the premises  
4 hereby conveyed; that Grantor has good right to sell and convey  
5 the property as aforesaid; that the property is free and clear  
6 from all encumbrances, except non-delinquent real property taxes  
7 and as may be described on Exhibit "A"; and that Grantor shall  
8 forever WARRANT AND DEFEND the title to the property against  
9 the lawful claims and demands of all persons.

10 AND in consideration of the foregoing premises and as a  
11 part of the transaction under which said estate is being  
12 purchased, the Grantee hereby assumes the balance due under that  
13 certain mortgage between the Grantor herein, as Mortgagor, and  
14 LORRAINE G. GRACE, Trustee of the Lori Grace Trust, as  
15 Mortgagee, dated February 22, 1984, and recorded in the Bureau  
16 of Conveyances of the State of Hawaii in Book 17678, Page 688,  
17 and the Grantee agrees to pay said balance, together with  
18 interest thereon from the date of this Deed by the installments  
19 and in the manner set forth in said Mortgage and the Promissory  
20 Note thereby secured, and the Grantee will, in all respects,  
21 faithfully observe and perform all of the terms, covenants and  
22 conditions of said Mortgage and said Note and the Grantee  
23 further covenants and agrees to indemnify and save the Grantor  
24 harmless in the premises.

25 The terms "Grantor" and "Grantee" shall include, if  
26 appropriate, the plural and in such case shall inure to the  
27 benefit of or bind, as the case may be, the Grantors and  
28 Grantees, jointly and severally, and their respective heirs,  
29 devisees, personal representatives, successors and assigns. The  
30 use of any gender includes all genders.

1 DATED at Wailuku, Maui, Hawaii, on the date first above  
2 written.

3  
4 David P. Charry  
5 DAVID P. CHARRY

6  
7 Lorraine L. Grace  
8 LORRAINE L. GRACE

Grantor

9  
10 Lorraine L. Grace  
11 LORRAINE L. GRACE

Grantee

12 STATE OF HAWAII )  
13 COUNTY OF MAUI ) SS.

14  
15 On this 7th day of March, 1988, before me  
16 personally appeared DAVID P. CHARRY and LORRAINE L. GRACE to me  
17 known to be the persons described in and who executed the  
18 foregoing instrument and acknowledged that they executed the  
19 same as their free act and deed.

20 Karyl Onoh  
21 Notary Public, State of Hawaii  
22 My commission expires: 1/21/90

23  
24  
25 GUY T. MOEN  
26 ATTORNEY AT LAW  
27 1975 VINEYARD STREET, #102  
28 WAILUKU, HAWAII 96793  
29 TELEPHONE 244-7617  
30  
31  
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EXHIBIT "A"PARCEL FIRST:

ALL of that certain parcel of land known as LOT 1B of Kahiamoe - Pitt Subdivision, a portion of Lot 1 of Kahiamoe Subdivision, situate at Huelo, Hamakualoa, Island and County of Maui, State of Hawaii, and more particularly described as follows:

Beginning at a concrete monument marked with a bronze disk stamped "3218-01-79" at the northeasternmost corner of this parcel of land, being also the northwesternmost corner of Lot 1C of the same subdivision, on the easterly side of Huelo Hui Road, the co-ordinates of said point of beginning being

North 2,018.8 feet

East 19,123.85 feet

referred to Government Triangulation Station "KAPUAI" and running by azimuths measured clockwise from true South (meridian of said "KAPUAI"): thence,

1. 286° 02' 20"            577.5 feet along Lot 1C passing over a concrete monument marked with a bronze disk stamped "3218-02-79" at 575.5 feet to a point on the westerly bank of Hanehoi Gulch; thence,
2. Along the westerly bank of Hanehoi Gulch, the direct chord azimuth and distance being  
       2° 05'            104.5 feet to a point on the westerly bank of Hanehoi Gulch; thence,
3. Along same, the direct chord azimuth and distance being  
       34° 41'            238.86 feet to a point on the westerly bank of Hanehoi Gulch; thence,
4. 105° 29' 30"            235.0 feet along Lot 1A passing over a concrete monument marked with a bronze disk stamped "3218-03-79" at ten feet to a concrete monument marked with a bronze disk stamped "3218-04-79"; thence,
5. 195° 29' 30"            310.0 feet along same to an iron bar; thence,
6. 106° 02' 20"            268.0 feet along same to an iron bar; thence,

7. Along a curve to the left with a radius of 20.00 feet, and a central angle of  $90^{\circ} 32' 50''$ , the direct chord azimuth and distance being
- 60° 45' 55"      28.42 feet along same to an iron bar; thence,
8. 195° 29' 30"      40.19 feet along easterly side of Huelo Hui Road to the point of beginning and containing an area of 2.27 acres, more or less.

PARCEL SECOND:

10% undivided interest in that certain parcel of land known as LOT 4 of the Kahiamoe Subdivision, situate approximately 2,000 feet southeasterly of Waimea Bay, at Huelo and Puolua, Hamakualoa, Maui, Hawaii, being a 5.00 feet wide strip of land reserved for road widening purposes, and being also a portion of Lot 9 of Huelo Hui Partition Lots, and being also portions of R. P. 6847, L. C. Aw. 520, Apana 1 to Daniel Ii and Grant 2079, Apana 3 to Kalewe, described as follows:

Beginning at the southwesterly corner of this strip of land, on the easterly side of a 30 foot road, the coordinates of said point of beginning referred to Government Survey Triangulation Station "Huelo 2" being 1,211.15 feet North and 18,894.83 feet East and thence running by azimuths measured clockwise from true South:

1. 195° 29' 30"      124.39 feet along the easterly side of a 30 foot road along the remainders of R. P. 6847, L. C. Aw. 520, Apana 1 to Daniel Ii and Grant 2079, Apana 3 to Kalewe;
2. 282° 59' 30"      780.61 feet along the southerly side of a 30 foot road along the same;
3. 33° 10'      5.33 feet along Lot 3 of Kahiamoe Subdivision along the remainder of R. P. 6847, L. C. Aw. 520, Apana 1 to Daniel Ii;
4. 102° 29' 30"      754.85 feet along Lots 2 and 3 of Kahiamoe Subdivision along the remainders of R. P. 6847, L. C. Aw. 520 Apana 1 to Daniel Ii and Grant 2079, Apana 3 to Kalewe;

5. Thence along Lot 2 of Kahiamoe Subdivision along the remainder of Grant 2079, Apana 3 to Kaiewe along a curve to the left with a radius of 20.00 feet, the chord azimuth and distance being 59° 14' 30" 27.66 feet;
6. 15° 29' 30" 1301.03 feet along Lots 1 and 2 of Kahiamoe Subdivision along the remainders of Grant 2079, Apana 3 to Kaiewe and R. P. 6847, L. C. Aw. 520, Apana 1 to Daniel Ii;
7. 111° 56' 5.03 feet along the remainder of R. P. 6847, L. C. Aw. 520, Apana 1 to Daniel Ii to the point of beginning and containing an area of 0.243 acres, more or less.

SUBJECT, HOWEVER, to the following:

1. Reservation in favor of the State of Hawaii of all mineral and metallic mines as reserved in Royal Patent Grant No. 2079 and Royal Patent Grant No. 6847.
2. A four inch (4") waterline running under and across the westerly end of the premises described hereinabove, in favor of others entitled thereto, as shown on the Kahiamoe-Pitt Subdivision map dated August 20, 1979 (revised), prepared by Brock and Associates, Registered Professional Surveyors.
3. Excepting and reserving unto Hawaiian Commercial and Sugar Company, a California corporation, Trustee under that certain Deed of Trust executed by J. K. Smythe, Trustee, dated June 23, 1922, recorded in the Bureau of Conveyances of the State of Hawaii in Liber 640, Page 367, any and all water and natural water rights including Konohiki Water Rights in any manner heretofore appurtenant or belonging to or connected with all of the said lands including Kuleanas and all other rights belonging or that might belong to the Konohiki of the Ahupuaa of Huelo; as excepted and reserved in Deed dated February 6, 1925, recorded in said Bureau of Conveyances in Liber 765, Page 349.
4. Grant dated February 29, 1960, recorded in said Bureau of Conveyances in Liber 3970, Page 186, in favor of Maui Electric Company, Ltd., a Hawaiian corporation.
5. Grant dated March 12, 1977, recorded in said Bureau of Conveyances in Liber 12434, Page 742, in favor of Maui Electric Company, Limited, a Hawaii corporation, and Hawaiian Telephone Company, also a Hawaii corporation.

6. The terms and provisions of that certain Agreement dated August 30, 1979, recorded in said Bureau of Conveyances in Liber 13982, Page 482.

7. The terms and provisions of that certain Subdivision Agreement (Large Lots) dated May 17, 1979, recorded in said Bureau of Conveyances in Liber 13983, page 78.

8. The terms and provisions of that certain Subdivision Agreement (Three Lots Or Less) dated May 17, 1979, recorded in said Bureau of Conveyances in Liber 13983, Page 84.

9. An "Agreement" dated May 20, 1981, by and between the County of Maui, Department of Water Supply, a political subdivision of the State of Hawaii, and Thomas J. Swenton, et al, subject to the terms, conditions and provisions contained therein, as recorded in said Bureau of Conveyances in Liber 15700 Page 639.

10. Mortgage between the Grantor, as Mortgagor, and Lorraine G. Grace, Trustee of the Lori Grace Trust, as Mortgagee, dated February 22, 1984, and recorded in the Bureau of Conveyances of the State of Hawaii in Book 17678, Page 688.

BEING the same property conveyed by instrument dated February 15, 1984, and recorded in said Bureau of Conveyances in Book 17678, Page 680.

**END OF EXHIBIT "A"**



LAND COURT SYSTEM

REGULAR SYSTEM

Return by Mail ( ) Pickup ( ) To:

MS LORRAINE G GRACE  
C/O GRACE & WHITE, INC.  
515 MADISON AVE.  
NEW YORK, NY 10022

TG: 200373307  
TGE: A32050335  
Mary Jo Cabral

Tax Key: (2) 2-9-007-053

Total No. of Pages: \_\_\_\_\_

WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS:

That MARK LINDSAY and DEBORAH LINDSAY, husband and wife, whose address is P. O. Box 1269, Haiku, Hawaii 96708, hereinafter called the "Grantor," in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration to Grantor paid by LORRAINE G. GRACE, Trustee under that certain Trust Deed dated December 18, 1950, with full power to purchase, sell, mortgage, dispose or otherwise hypothecate real property, whose address is c/o Grace & White, Inc., 515 Madison Avenue,

Suite 170909, New York, New York 10022, hereinafter called the "Grantee," the receipt whereof is hereby acknowledged, does hereby grant and convey unto the Grantee, as Trustee aforesaid, her successors in trust and assigns, the real property described in Exhibit "A" attached hereto and by this reference incorporated herein; subject, however, to all encumbrances noted on said Exhibit "A".

TO HAVE AND TO HOLD the same, together with any improvements thereon and the rights, easements, privileges, and appurtenances thereunto belonging or appertaining unto the Grantee, the heirs, representatives, administrators, successors and assigns of the Grantee, forever.

AND the Grantor covenants with the Grantee that the former is now seised in fee simple of the property granted; that the latter shall enjoy the same without any lawful disturbance; that the same is free from all encumbrances, except the liens and encumbrances hereinbefore mentioned, and except also the liens and encumbrances created or permitted by the Grantee after the date hereof; and that the Grantor will WARRANT and DEFEND the Grantee against the lawful claims and demands of all persons claiming the whole or any part of the above bargained and granted lands and premises.


The terms "Grantor" and "Grantee", as and when used herein, or any pronouns used in place thereof, shall mean and

include the masculine or feminine, or neuter, the singular or plural number, individuals or corporations, and their and each of their respective successors, heirs, personal representatives, and permitted assigns, according to the context hereof. If these presents shall be signed by two or more Grantors or by two or more Grantees, all covenants of such parties shall for all purposes be joint and several.

IN WITNESS WHEREOF, the Grantor has executed these presents on this \_\_\_\_\_ day of JAN 20 2004, 20\_\_\_\_.

APPROVED AS TO FORM:  
MANCINI, WELCH & GEIGER

By Peter A. Horovitz

  
\_\_\_\_\_  
MARK LINDSAY

  
\_\_\_\_\_  
DEBORAH LINDSAY

Grantor

STATE OF HAWAII                    )  
  )  SS.  
COUNTY OF MAUI                    )

On this \_\_\_\_\_ day of JAN 20 2004, 20\_\_\_\_, before me personally appeared MARK LINDSAY and DEBORAH LINDSAY, to me personally known, who, being by me duly sworn or affirmed, did say that such person(s) executed the foregoing instrument as the free act and deed of such person(s), and if applicable, in the capacities shown, having been duly authorized to execute such instrument in such capacities.

*Mary Jo K Cabral*

Print Name: Mary Jo K. Cabral

Notary Public, State of Hawaii.

MARY JO K. CABRAL

My commission expires: \_\_\_\_\_

Expiration Date: December 9, 200

EXHIBIT "A"

PARCEL FIRST:

All of that certain parcel of land (being portion(s) of the land(s) described in and covered by Royal Patent Number 2079, Apana 3 to Kaiewe and Royal Patent Number 6847, Land Commission Award Number 520, Apana 1 to Daniel Ii) situate, lying and being at Huelo, Puolua, Hamakualoa, Island and County of Maui, State of Hawaii, being LOT 2-A-1 of "KAHIAMOE SUBDIVISION", a subdivision on file with the Department of Public Works and Waste Management (LUCA File No. 2.2534 ), and thus bounded and described:

Beginning at a 1/2 inch pipe at the southwesterly corner of this lot and at the east side of existing Lot 4 (Road Widening Lot) of Kahiamoe Subdivision, the coordinates of said point of beginning being

north 2,211.51 feet  
east 19,177.28 feet

referred to Government Survey Triangulation Station "KAPUAI" and running by azimuths measured clockwise from true South (meridian of said "KAPUAI"); thence,

1. 195° 29' 30" 251.43 feet along Lot 4 (Road Widening Lot) of Kahiamoe Subdivision to a 1/2 inch pipe; thence,
2. Along Lot 2-C (Roadwidening Lot) of this subdivision on a curve to the right with a radius of 30.00 feet and a central angle of 87° 30", the chord azimuth and distance being  
239° 14' 30" 41.49 feet to a 1/2 inch pipe;  
thence,
3. 282° 59' 30" 110.00 feet along Lot 4 (Roadwidening Lot) of Kahiamoe Subdivision to a 1/2 inch pipe; thence,

- |     |      |     |     |  |
|-----|------|-----|-----|--|
| 4.  | 12°  | 59' | 30" | 52.42 feet along Lot 2-B of this subdivision to a 1/2 inch pipe; thence,   |
| 5.  | 316° | 44' | 40" | 161.23 feet along the same to a 1/2 inch pipe; thence,   |
| 6.  | 220° | 01' | 50" | 52.00 feet along the same to a 1/2 inch pipe; thence,  |
| 7.  | 286° | 02' | 20" | 50.00 feet along the same to a 1/2 inch pipe; thence,  |
| 8.  | 317° | 19' | 30" | 95.00 feet along the same to a 1/2 inch pipe; thence,  |
| 9.  | 282° | 59' | 30" | 149.03 feet along the same to a 1/2 inch pipe; thence,   |
| 10. | 336° | 59' |     | 108.82 feet along the same to a 1/2 inch pipe; thence,   |
| 11. | 76°  | 53' |     | 46.01 feet along top of pali of Hanehoi Gulch to a found 1/2 inch pipe; thence,  |
| 12. | 52°  | 15' |     | 64.45 feet along the same to a found 3/4 inch pipe; thence,  |
| 13. | 106° | 02' | 20" | 568.72 feet along Lot 1-C of Kahiamoe Subdivision to the point of beginning and containing an area of 2.799 acres, more or less. |

Together with Easement A for electrical purposes over and across portion of Lot 2-B of this subdivision, the coordinates of said point of beginning being

north 2,355.44 feet  
east 19,798.41 feet

referred to Government Survey Triangulation Station "KAPUAI" and running by azimuths measured clockwise from true South (meridian of said "KAPUAI"); thence,

1. 282° 59' 30" 15.18 feet along Lot 4 (Road Widening Lot) of Kahiamoe Subdivision to a point; thence,
2. 21° 46' 105.62 feet over and across this lot to a point; thence,
3. 77° 34' 110.74 feet over and across the same to a point; thence,
4. 102° 59' 30" 34.94 feet along Lot 2-A of this subdivision to a point; thence,
5. 257° 34' 134.35 feet over and across this lot to a point; thence,
6. 201° 46' 95.36 feet over and across the same to the point of beginning and containing an area of 3,346 square feet or 0.077 acres, more or less.

Together with, however, to a portion of Lot 4 (Road Widening Lot) of Kahiamoe Subdivision adjacent to course nos. 1, 2 and 3 of the above for access and utility purposes.

Being the premises acquired by Quitclaim Deed between RICHARD R. BOUCK, unmarried, as Grantor, and MARK LINDSAY and DEBORAH LINDSAY, husband and wife, as Grantee, dated \_\_\_\_\_, recorded in the Bureau of Conveyances of the State of Hawaii as Document No. \_\_\_\_\_.

PARCEL SECOND:

All of that certain parcel of land (being portions of the land(s) described in and covered by Royal Patent 2079, Apana 3 to Kaiewe) situate, lying and being at Huelo, Puolua, Hamakualoa, Island and County of Maui, State of Hawaii, known as Lot 2-C of Kahiamoe Subdivision, a subdivision on file with the Department of Public Works and Waste Management (LUCA File No. 2.2235) and thus bounded and described per survey of Edgardo V. Valera, Licensed Professional Land Surveyor, dated December 2:

Beginning at the southernmost corner of this lot and at the east side of Lot 4 (Road Widening Lot) of Kahiamoe Subdivision, the coordinates of said point of beginning being

north 2,453.80 feet  
east 19,244.43 feet

referred to Government Survey Triangulation Station "KAPUAI" and running by azimuths measured clockwise from true South (meridian of said "KAPUAI"); thence,

1. 195° 29' 30" 9.57 feet along Lot 4 (Road Widening Lot) of Kahiamoe Subdivision to a found 1/2 inch pipe; thence,
2. Along the same on a curve to the right with a radius of 20.00 feet and a central angle of 87° 30', the chord azimuth and distance being  
239° 49' 30" 27.66 feet to a found 1/2 inch pipe; thence,
3. 282° 59' 30" 9.57 feet to a 1/2 inch pipe; thence,
4. Along Lot 2-B of this subdivision on a curve to the left with a radius of 30.00 feet and a central angle of 87° 30', the chord azimuth and distance being  
59° 14' 30" 41.49 feet to the point of beginning and containing an area of 97 square feet or 0.002 acre, more or less.

Being the premises acquired by WARRANTY DEED between RICHARD R. BOUCK, also known as Richard Bouck, unmarried, as Grantor, and MARK LINDSAY and DEBORAH LINDSAY, husband and wife, as Tenants by the Entirety, as Grantee, dated March 24, 1999, recorded in the Bureau of Conveyances of the State of Hawaii as Document No. 99-056118.



SUBJECT, HOWEVER, to the following:

1. Reservation in favor of the State of Hawaii of all mineral and metallic mines.
2. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in the DEED dated February 6, 1925, recorded in the said Bureau of Conveyances in Liber 765 on Page 349.

The foregoing includes, but is not limited to, matters relating to the following:

Excepting and Reserving unto Hawaiian Commercial and Sugar Company, a California corporation, Trustee under that certain Deed of trust executed by J. K. Smythe, Trustee, dated June 23, 1922, recorded in Liber 640 at Page 367, any and all water and natural water rights including Konohiki water rights in any manner heretofore appurtenant or belonging to or connected with all of the said lands including Kuleanas and all other rights belonging or that might belong to the Konohiki of the Ahupuaa of Huelo.

3. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in WATER SYSTEM AGREEMENT dated August 30, 1979, recorded in the said Bureau of Conveyances in Liber 13982 on Page 482, by and between COUNTY OF MAUI, through its Department of Water Supply, a political subdivision of the State of Hawaii, JOHN KAHIAMOE and DOLLY KAHIAMOE, husband and wife, and STEPHEN PITT.

4. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in PRIVATE WATER SYSTEM AGREEMENT dated February 27, 1987, recorded in the said Bureau of Conveyances in Liber 20476 on Page 206, by and between RICHARD R. BOUCK, and the COUNTY OF MAUI and its DEPARTMENT OF WATER SUPPLY.

5. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in SUBDIVISION AGREEMENT (AGRICULTURAL USE) dated July 25, 1995, recorded in the said Bureau of Conveyances as Document No. 96-045140, by and between RICHARD R. BOUCK and the COUNTY OF MAUI, through its Department of Public Works and Waste

Management, a body politic and corporate, and a political subdivision of the State of Hawaii.

6. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in SUBDIVISION AGREEMENT (THREE LOTS OR LESS) dated August 17, 1995, recorded in the said Bureau of Conveyances as Document No. 96-045141, by and between RICHARD R. BOUCK and the COUNTY OF MAUI, a body politic and corporate and a political subdivision of the State of Hawaii.

7. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in MODIFICATION OF SUBDIVISION REQUIREMENTS AGREEMENT dated January 29, 1997, recorded in the said Bureau of Conveyances as Document No. 97-043529, by and between RICHARD R. BOUCK, unmarried, and the BOARD OF WATER SUPPLY of the County of Maui.

8. AS TO PARCEL FIRST:

(A) The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in AGREEMENT RELATING TO FIRE PROTECTION dated August 28, 2000, recorded in the said Bureau of Conveyances as Document No. 2000-124633, by and between RICHARD R. BOUCK, "Applicant", and COUNTY OF MAUI.

END OF EXHIBIT "A"

Tax Key: (2) 2-9-007-053



R-261 STATE OF HAWAII  
 BUREAU OF CONVEYANCES  
 RECORDED  
 DEC 19, 2002 08:01 AM  
 Doc No(s) 2002-226438



10 1/1 24

/s/ CARL T. WATANABE  
 REGISTRAR OF CONVEYANCES  
 CONVEYANCE TAX: \$840.00

LAND COURT SYSTEM

REGULAR SYSTEM

Return by Mail  Pickup  To:

MS LORI GRACE  
 c/o GRACE & WHITE INC  
 515 MADISON AVE #1700  
 NEW YORK, NY

TG: 20 0246789 P  
 TGE: A2-204-1312  
 Lynette A. Aipa

Rls  
 (1)

Tax Key: (2) 2-9-007-057 CPR No. 1 Apt. No. A Total No. of Pages: 10

APARTMENT DEED

THIS INDENTURE made this 16 day of December,  
 2002, by and between THOMAS JOHN SWENTON, unmarried, and GRIF  
 GRIFFIS, unmarried, both whose address is P. O. Box 1059, Haiku,  
 Hawaii 96708, hereinafter called "Grantor", and LORRAINE G.  
 GRACE, Trustee under Trust Deed dated December 18, 1950 made by  
 Oliver R. Grace, as Grantor, as amended, with full power to  
 purchase, sell, mortgage, dispose or otherwise hypothecate real  
 property, whose address is c/o Grace & White Inc., 515 Madison  
 Avenue, #1700, New York, New York, hereinafter called "Grantee",

WITNESSETH:

The Grantor, in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration to Grantor paid, the receipt of which is acknowledged, does hereby grant, bargain, sell and convey unto the Grantee as Trustee aforesaid, her successors in trust and assigns, the real property described in Exhibit "A" attached hereto and by reference incorporated herein; subject, however, to all encumbrances noted on said Exhibit "A".

And the reversions, remainders, rents, issues and profits thereof, and all the estate, right, title and interest of the Grantor therein and thereto, and all improvements thereon and the easements, privileges, and appurtenances thereunto appertaining.

TO HAVE AND TO HOLD the same unto the Grantee, the heirs, representatives, administrators, successors and assigns of the Grantee, absolutely and in fee simple, subject as aforesaid.

The Grantor hereby covenants with the Grantee that Grantor is the owner in fee simple of the apartment and undivided interest in the land and premises and has good right to sell and convey the same; that the same are free and clear of all encumbrances, except as set forth herein; that Grantor will

and Grantor's heirs, representatives, administrators, successors and assigns shall WARRANT and DEFEND the same unto the Grantee, the heirs, representatives, administrators, successors and assigns of the Grantee, against the lawful claims and demands of all persons except as aforesaid.

The terms "Grantor" and "Grantee", as and when used herein, or any pronouns used in place thereof, shall mean and include the masculine or feminine, or neuter, the singular or plural number, individuals or corporations, and their and each of their respective successors, heirs, personal representatives, and permitted assigns, according to the context hereof. If these presents shall be signed by two or more Grantors or by two or more Grantees, all covenants of such parties shall for all purposes be joint and several.

IN WITNESS WHEREOF, the Grantor has executed this instrument on the day and year first above written.

APPROVED AS TO FORM:  
MANCINI, WELCH & GEIGER

By Thomas D. Welch

THOMAS JOHN SWENTON

GRIFF GRIFFIS

Grantor

STATE OF HAWAII )  
 ) SS.  
COUNTY OF MAUI )

On this 16 day of December, 2002, before me personally appeared THOMAS JOHN SWENTON, to me personally known, who, being by me duly sworn or affirmed, did say that such person(s) executed the foregoing instrument as the free act and deed of such person(s), and if applicable, in the capacities shown, having been duly authorized to execute such instrument in such capacities.

*T.S.*

*Lynette A. Aipa*  
Print Name: Lynette A. Aipa  
Notary Public, State of Hawaii.

My commission expires: 11/7/2004

STATE OF HAWAII )  
 ) SS.  
COUNTY OF MAUI )

On this 16 day of December, 2002, before me personally appeared GRIF GRIFFIS, to me personally known, who, being by me duly sworn or affirmed, did say that such person(s) executed the foregoing instrument as the free act and deed of such person(s), and if applicable, in the capacities shown, having been duly authorized to execute such instrument in such capacities.

*T.S.*

*Lynette A. Aipa*  
Print Name: Lynette A. Aipa  
Notary Public, State of Hawaii.

My commission expires: 11/7/2004

EXHIBIT "A"

All of the premises comprising a portion of the Project known as "PALI ULI CONDOMINIUM", said Project having been established as a Condominium Property Regime by Declaration of Condominium Property Regime of Pali Uli Condominium, dated May 19, 2000, and recorded in the Bureau of Conveyances of the State of Hawaii as Document No. 2000-098005, as may be amended from time to time (herein called the "Declaration"), and Bylaws of the Association of Unit Owners of Pali Uli Condominium, dated May 19, 2000, and recorded in the said Bureau of Conveyances as Document No. 2000-098006, as may be amended from time to time (herein called the Bylaws"), the premises hereby conveyed being more particularly described as follows:

FIRST:

A. Apartment No. A as shown on Condominium Map No. 3129 recorded in the said Bureau of Conveyances:

Together with nonexclusive easements for ingress and egress and support of said Apartment through the common elements of the Project and for repair of said Apartment through all other apartments and through the common elements of the Project;

B. An undivided 1/3 interest as tenant in common in and to the common elements of the Project as described by the Declaration.

C. All rights to use and enjoy the Limited Common Element appurtenant to said apartment as set forth in the Declaration.

SECOND:

An undivided one-third (1/3) interest in the land more particularly described as follows:

The land upon which said Condominium Project "PALI ULI CONDOMINIUM" is located and described as follows:

FIRST:

All of that certain parcel of land (portions of the land described in and covered by Royal Patent Number 6347, Land

Commission Award Number 520, Apana 1 to Daniel Ii, and Grant 2079, Apana 3 to Kaiewe) situate, lying and being at Huelo, Hamakualoa, Island and County of Maui, State of Hawaii, being LOT 1C of the "KAHIAMOE-PITT SUBDIVISION", same being a subdivision of Lot 1 of the "KAHIAMOE SUBDIVISION" and a portion of Lot 9 of the "HUELO HUI PARTITION LOTS", and thus bounded and described:

Beginning at a found 1/2" pipe on the easterly side of a 30 foot Hui road at the northernmost corner of this parcel of land being also the southwesternmost corner of Lot 2 of the Kahiamoe Subdivision, the coordinates of said point of beginning being

North 2,211.52 feet  
East 19,177.26 feet

referred to Government Survey Triangulation Station "KAPUAI" and running by azimuths measured clockwise from true South (meridian of said "KAPUAI"); thence,

1. 286° 02' 20" 568.72 feet along Lot 2 of the Kahiamoe Subdivision to a found pipe on the top bank of the westerly side of Hanehoi Gulch at the easternmost corner of this parcel of land being also the southernmost corner of Lot 2 of said subdivision; thence,
2. Along the top bank on the westerly side of Hanehoi Gulch, the direct chord and azimuth and distance being  
24° 00' 80.00 feet to a point; thence,
3. Along same, the direct chord azimuth and distance being  
5° 49' 122.70 feet to a 3/4" iron bar at the top bank being the southernmost corner of this parcel of land and the easternmost corner of Lot 1B of said subdivision thence,
4. 106° 02' 20" 577.50 feet along Lot 1B of said subdivision passing over a



concrete monument marked with a bronze disk stamped "3218-02-79" set over a 3/4" iron bar at 10.0 feet to a concrete monument marked with a bronze disk stamped "3218-01-79" set over a 3/4" iron bar at the westernmost corner of this parcel of land being also the northernmost corner of Lot 1B on the easterly side of a 30 foot wide Hui road, thence,

5. 195° 29' 30" 200.00 feet along the southeasterly side of a five foot wide dedication strip on the southeasterly side of a 30 foot Hui road to the point of beginning and containing an area of 2.600 acres, more or less.

SECOND:

An undivided 10% interest in that certain parcel of land (portions of the lands described in and covered by Royal Patent Number 6847, Land Commission Award Number 520, Apana 1 to Daniel Ii, and Grant 2079, Apana 3 to Kaiewe) situate, lying and being at approximately 2,000 feet southeasterly of Waimea Bay, at Huelo and Puolua, Hamakualoa, Island and County of Maui, State of Hawaii, being LOT 4 of the "KAHIAMOE SUBDIVISION", and being a 5.00 feet wide strip of land reserved for road widening purposes, and being also a portion of Lot 9 of "HUELO HUI PARTITION LOTS", and thus bounded and described:

Beginning at the southwesterly corner of this strip of land on the easterly side of a 30 foot road, the coordinates of said point of beginning referred to Government Survey Triangulation Station "HUELO 2" being 1,211.15 feet North and 18,894.83 feet East and thence running by azimuths measured clockwise from true South:

1. 195° 29' 30" 124.39 feet along the easterly side of a 30 foot road along the remainders of Royal Patent Grant 6847, Land Commission Award Number 520, Apana 1 to Daniel Ii and Grant 2079, Apana 3 to Kaiewe;

2. 282° 59' 30" 780.61 feet along the southerly side of a 30 foot road along the same;
3. 33° 10' 5.33 feet along Lot 3 of Kahiamoe Subdivision along the remainder of Royal Patent Grant 6847, Land Commission Award Number 520, Apana 1 to Daniel Ii;
4. 102° 29' 30" 754.85 feet along Lots 2 and 3 of Kahiamoe Subdivision along the remainders of Royal Patent Grant 6847, Land Commission Award Number 520, Apana 1 to Daniel Ii and Grant 2079, Apana 3 to Kaiewe;
5. Thence along Lot 2 to Kahiamoe Subdivision along the remainder of Grant 2079, Apana 3 to Kaiewe along a curve to the left with a radius of 20.00 feet, the chord azimuths and distance being 59° 14' 30" 27.66 feet;
6. 15° 29' 30" 1301.03 feet along Lots 1 and 2 of Kahiamoe Subdivision along the remainders of Grant 2079, Apana 3 to Kaiewe and Royal Patent Grant 6847, Land Commission Award Number 520, Apana 1 to Daniel Ii;
7. 111° 56' 5.03 feet along the remainder of Royal Patent Grant 6487, Land Commission Award Number 520, Apana 1 to Daniel Ii to the point of beginning and containing an area of 0.243 acre, more or less.

Being the premises acquired by Apartment Deed from Thomas John Swenton, unmarried, and Grif Griffis, unmarried, as Grantor, to the Grantor herein, as Grantee, dated August 19, 2002, recorded in the Bureau of Conveyances of the State of Hawaii as Document No. 2002-148027.

SUBJECT, HOWEVER, to the following:

1. Reservation in favor of the State of Hawaii of all mineral and metallic mines.

2. A 4" waterline running under and across the westerly end of the land described herein, in favor of others entitled thereto, as shown on surveyor's map dated August 20, 1979, prepared by James Melmuth Brock.

3. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Deed dated February 6, 1925, and recorded in the said Bureau of Conveyances in Liber 7654 on Page 349.

The foregoing includes, but is not limited to, the following:

Excepting and reserving unto Hawaiian Commercial and Sugar Company, a California corporation, Trustee under that certain Deed of Trust executed by J. K. Smythe, Trustee, dated June 23, 1922, recorded in the said Bureau of Conveyances in Liber 640 on Page 367, any and all water and natural water rights including Konohiki Water Rights in any manner heretofore appurtenant or belonging to or connected with all of the said lands including Kuleanas and all other rights belonging or that might belong to the Konohiki of the Ahupuaa of Huelo.

4. Grant to Maui Electric Company, Limited dated February 29, 1960, and recorded in the said Bureau of Conveyances in Liber 3970 on Page 186, granting an easement for electrical purposes.

5. Grant to Maui Electric Company, Limited and GTE Hawaiian Telephone Company Incorporated dated March 12, 1977, and recorded in the said Bureau of Conveyances in Liber 12434 on Page 742, granting an easement for utility purposes.

6. Agreement dated August 30, 1979, and recorded in the said Bureau of Conveyances in Liber 13982 on Page 482, made by and between the County of Maui, through its Department of Water Supply, and John Kahiamoe and Dolly Kahiamoe, husband and wife, and Stephen Pitt.

7. Subdivision Agreement (Large Lots) dated May 17, 1979, and recorded in the said Bureau of Conveyances in Liber 13983 on Page 78, made by and between John Kahiamoe, Dolly Kahiamoe and Stephen Pitt, and the County of Maui.

8. Subdivision Agreement (Three Lots or Less) dated May 17, 1979, and recorded in the said Bureau of Conveyances in Liber 13983 on Page 84, made by and between John Kahiamoe, Dolly Kahiamoe and Stephen Pitt, and the County of Maui.

9. Private Water System Agreement dated October 13, 1983, and recorded in the said Bureau of Conveyances in Liber 17392 on Page 381, by and between the County of Maui and the Department of Water Supply, County of Maui, and Thomas J. Swenton.

10. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Declaration of Condominium Property Regime for "Pali Uli Condominium" Condominium Project dated May 19, 2000, and recorded in the said Bureau of Conveyances as Document No. 2000-098005, covered by Map 3129 and any amendments thereto.

11. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in By-Laws of the Association of Apartment Owners dated May 19, 2000, and recorded in the said Bureau of Conveyances as Document No. 2000-098006.

12. AS TO PARCEL SECOND ONLY:

Rights of others who own undivided interest(s) in the land described herein.

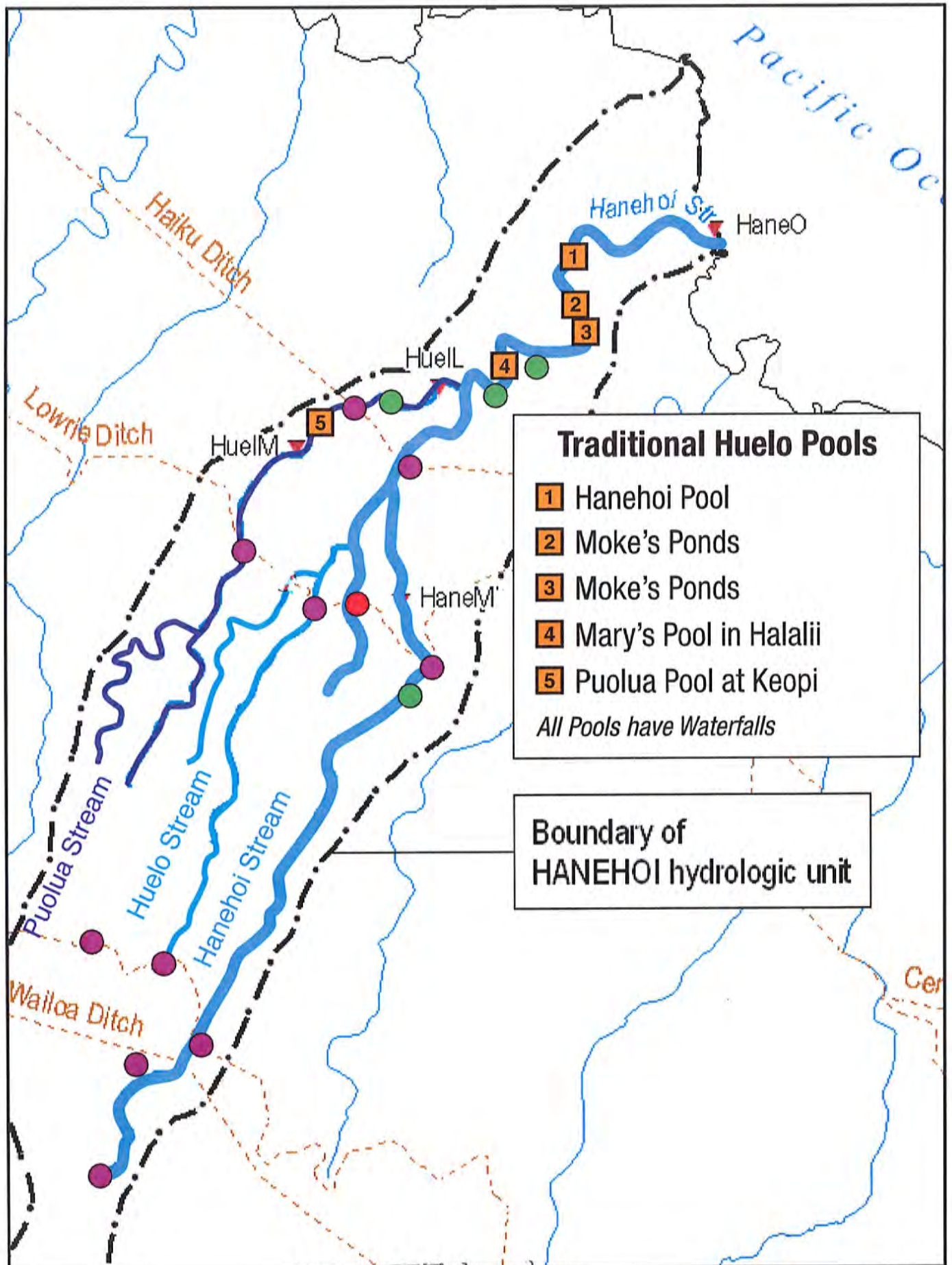
END OF EXHIBIT "A"

Tax Key: (2) 2-9-007-057 C.P.R. No. 0001 Apt. No. A



HAVE HOI FALLS  
RARELY HAS  
THIS MAGNIFICENT  
FLOW

EXHIBIT E-39



**EXHIBIT E-40**



R-103 STATE OF HAWAII  
 BUREAU OF CONVEYANCES  
 RECORDED  
 JUN 03, 2011 08:01 AM  
 Doc No(s) 2011-088104



20 1/4 Z1

/s/ NICKI ANN THOMPSON  
 REGISTRAR  
 CONVEYANCE TAX: \$0.00

<p>LAND COURT SYSTEM</p> <hr/> <p>AFTER RECORDATION, RETURN TO:          Donald Halley Jr.          PO Box 1710          Maika Wao HI 96768</p>	1/4	<p>REGULAR SYSTEM</p> <hr/> <p>RETURN BY: MAIL <input checked="" type="checkbox"/> PICKUP <input type="checkbox"/></p> <p>TG: 201104044 A          TGE: T1-105-3095          Kyle Barker</p>
		<p>Total pages: 6</p>

① R/S

ISC

Tax Map Key No. (2) 2-9-7-64

**WARRANTY DEED**

THIS DEED, made on May 26, 2011, by **DONALD MacDOUGAL HALLEY, JR., Trustee of the Donald MacDougal Halley, Jr. Revocable Living Trust dated July 7, 2004**, of which a Short Form Declaration is recorded in the Bureau of Conveyances of the State of Hawaii as Document No. 2004-215987, hereinafter called the "Grantor", in favor of **DONALD MacDOUGAL HALLEY, JR., Trustee of the Donald MacDougal Halley, Jr. Revocable Living Trust dated July 7, 2004**, of which a Short Form Declaration is recorded in said Bureau as Document No. 2004-215987, and **CHRISTA A. MORF, wife of Donald MacDougal Halley, Jr.**, both of whose address is **64 Door of Faith Road, Haiku, Hawaii 96708**, hereinafter collectively called the "Grantee",

**WITNESSETH THAT:**

The Grantor, in consideration of the sum of TEN DOLLARS (\$10.00) and other valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged by the Grantor, does hereby grant, bargain, sell and convey unto the Grantee, in fee simple, all of the property more particularly described in Exhibit A attached hereto and made a part hereof;

And the reversions, remainders, rents, issues and profits thereof and all of the estate, right, title and interest of the Grantor, both at law and in equity, therein and thereto;

TO HAVE AND TO HOLD the same, together with all buildings, improvements, rights, easements, privileges and appurtenances thereon and thereunto belonging or appertaining or held and enjoyed therewith, unto the Grantee according to the tenancy hereinafter set forth, forever.

**EXHIBIT E-41 "A"**

The Grantor does hereby covenant with the Grantee that the Grantor is seised of the property herein described in fee simple; that said property is free and clear of and from all liens and encumbrances, except for the lien of real property taxes not yet by law required to be paid, and except as may herein specifically be set forth; that the Grantor has good right to sell and convey said property, as aforesaid; and, that the Grantor will WARRANT AND DEFEND the same unto the Grantee against the lawful claims and demands of all persons, except as aforesaid.

This conveyance and the warranties of the Grantor are expressly declared to be in favor of the Grantee, as follows:

An undivided fifty percent (50%) interest to Donald MacDougal Halley, Jr., as **trustee aforesaid**, his successors in trust and assigns; and

An undivided fifty percent (50%) interest to Christa A. Morf, **as tenant in severalty**, her heirs, devisees, personal representatives and assigns;

and as and between the Grantee Donald MacDougal Halley, Jr. , Trustee aforesaid, and the Grantee Christa A. Morf, **as tenants in common**, in and to the whole of the same.

The Grantee hereby accepts the property described in Exhibit A.

The rights and obligations of the Grantor and the Grantee shall be binding upon and inure to the benefit of their respective heirs, devisees, personal representatives, successors-in-trust and assigns. All obligations undertaken by two or more persons shall be deemed to be joint and several unless a contrary intention is clearly expressed elsewhere herein.

IN WITNESS WHEREOF, the Grantor and the Grantee have executed these presents on the day and year first above written.

[The remainder of this page is intentionally left blank - signature page(s) follow(s)]



## EXHIBIT A

All of that certain parcel of land (being portion(s) of the land(s) described in and covered by Royal Patent Grant Number 2079, Apana 3 to Kaiewe, and Royal Patent Grant Number 3214 to Papaieka) situate, lying and being at Puolua and East Waipio, Hamakualoa, Island and County of Maui, State of Hawaii, being Lot 2-C, a portion of Lot 2 of "Vision Hawaii Subdivision" and thus bounded and described:

Beginning at a 1/2 inch pipe at the southeasternmost corner of this lot, the coordinates of said point of beginning being, north 1,293.47 feet, east 18,232.88 feet, referred to Government Survey Triangulation Station "Kapuai" and running by azimuths measured clockwise from true South (meridian of said "Kapuai"), thence,

1. 106° 49' 30" 389.93 feet along Lot 1 of Vision Hawaii Subdivision to a found bronze disk in concrete; thence,
2. 120° 30' 208.00 feet along the land owned by Hawaii Conference Foundation (TMK: (2) 2-9-007-012) to a found bronze disk in concrete; thence,
3. 210° 30' 50.00 feet along Lot 3-B of Vision Hawaii Subdivision to a 1/2 inch pipe; thence,
4. 232° 19' 150.22 feet along Lot 3-A of Vision Hawaii Subdivision to a 1/2 inch pipe; thence,
5. 274° 00' 100.00 feet along the same to a 1/2 inch pipe; thence,
6. 290° 15' 131.97 feet along the same to a 1/2 inch pipe; thence,
7. 340° 24' 07" 230.90 feet along Lot 2-B of this subdivision to a 1/2 inch pipe; thence,
8. 286° 49' 30" 100.00 feet along the same to a 1/2 inch pipe; thence,
9. 34° 17' 50.91 feet along the same to the point of beginning and containing an area of 2.011 acres, more or less.

Excepting and reserving therefrom Triangulation Station "Papaieka", a circular piece of land having a radius of five (5) feet centered on the Triangulation Station known and described as E.M.I. Triangulation Station 92 "Papaieka", the coordinates of which are 1,511.5 feet north and 17,767.1 feet east referred to Government Survey Triangulation Station "Kapuai", said parcel of land having an area of 78.5 square feet, together with a perpetual easement for a right of way for access to and egress from said Triangulation Station "Papaieka".

Together with an Easement "A" for access purposes over and across portion of Lot 1 of Vision Hawaii Subdivision, as granted in Deed dated May 2, 1997, recorded in the Bureau of Conveyances of the State of Hawaii as Document No. 97-060534, more particularly described therein.

Together also with a portion of Easement "A-1" for access purposes, over and across portion of Lot 2-B of said subdivision, as granted in Deed dated May 2, 1997, recorded in said Bureau as Document No. 97-060534, more particularly described therein.

Together also with a perpetual non-exclusive roadway easement over and across Lot 5 of said subdivision, as granted in Grant of Easement dated March 29, 2011, recorded in said Bureau as Document No. 2011-055097, more particularly described therein.

Being the premises described in Warranty Deed to Trust dated July 7, 2004, recorded in said Bureau as Document No. 2004-215986.

Subject, however, to the following:

1. Mineral and water rights of any nature in favor of the State of Hawaii.
2. Free flowage of Kapalaoa Stream.
3. The terms and provisions contained in Deed dated May 23, 1927, recorded in said Bureau in Liber 898, at Page 265, which includes, but is not limited to, matters relating to the following:

"The party of the first part hereby further excepting and reserving unto itself from its foregoing grant of said lands all of the water and water rights of every kind, whether above or below the surface of the ground, belonging or which may be deemed appurtenant to said lands of any of them, whether heretofore actually diverted, withdrawn or utilized by the party of the first part or not."
4. Perpetual easement for right of way and for access to and egress from Triangulation Station "Papaikea".
5. The terms and provisions contained in Agreement dated December 1, 1989, recorded in said Bureau as Document No. 90-107400, regarding agricultural use.
6. The terms and provisions contained in Agreement dated —, recorded in said Bureau as Document No. 90-118621, regarding three lots or less.
7. Grant of a perpetual easement for electrical purposes, in favor of Maui Electric Company, Limited and GTE Hawaiian Telephone Company Incorporated, now known as Hawaiian Telcom, Inc., dated July 6, 1990, recorded in said Bureau as Document No. 90-121978.
8. The terms and provisions contained in Agreement dated July 6, 1990, recorded in said Bureau as Document No. 90-132755, regarding private water system.
9. The terms and provisions contained in Deed dated March 12, 1991, recorded in said Bureau as Document No. 91-054130.
10. Designation of Easement "B-1" (area 11,447 square feet or 0.263 acre) for utility, waterline and fire protection purposes, as shown on subdivision map dated February 10, 1994, prepared by Edgardo V. Valera, Registered Professional Land Surveyor.

TMK: (2) 2-9-007-064

**EXHIBIT "A"**

All of that certain parcel of land (being portion(s) of the land(s) described in and covered by Royal Patent Grant Number 2079, Apana 3 to Kaiwee, and Royal Patent Grant Number 3214 to Papaieka) situate, lying and being at Puolua and East Waipio, Hamakualoa, Island and County of Maui, State of Hawaii, being LOT 2-C, a portion of Lot 2 of "Vision Hawaii Subdivision" and thus bounded and described:

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4. 232° 19' 150.22 feet along Lot 3-A of Vision Hawaii Subdivision to a 1/2 inch pipe; thence,
5. 274° 00' 100.00 feet along the same to a 1/2 inch pipe; thence,
6. 290° 15' 131.97 feet along the same to a 1/2 inch pipe; thence,

EXHIBIT A CONTINUED

- |    |              |        |  |
|----|--------------|--------|--|
| 7. | 340° 24' 07" | 230.90 | feet along Lot 2-B of this subdivision to a 1/2 inch pipe; thence,                                 |
| 8. | 286° 49' 30" | 100.00 | feet along the same to a 1/2 inch pipe; thence,  |
| 9. | 34° 17'      | 50.91  | feet along the same to the point of beginning and containing an area of 2.011 acres, more or less. |

EXCEPTING AND RESERVING THEREFROM Triangulation Station "Papaikea", a circular piece of land having a radius of five (5) feet centered on the Triangulation Station known and described as E.M.I. Triangulation Station 92 "Papaikea", the coordinates of which are 1,511.5 feet north and 17,767.1 feet east referred to Government Survey Triangulation Station "KAPUAI", said parcel of land having an area of 78.5 square feet, together with a perpetual easement for a right of way for access to and egress from said Triangulation Station "Papaikea".

Together with an Easement "A" for access purposes over and across portion of Lot 1 of Vision Hawaii Subdivision, as granted in DEED dated May 2, 1997, recorded as Document No. 97-060534, more particularly described therein;

Together also with a portion of Easement "A-1" for access purposes, over and across portion of Lot 2-B of said subdivision, as granted in DEED dated May 2, 1997, recorded as Document No. 97-060534, more particularly described therein.

Together also with a perpetual non-exclusive roadway easement over and across LOT 5 of said subdivision, as granted in GRANT OF EASEMENT dated March 29, 2011, recorded as Document No. 2011-055097, more particularly described therein.

EXHIBIT A CONTINUED

BEING THE PREMISES ACQUIRED BY WARRANTY DEED TO TRUST

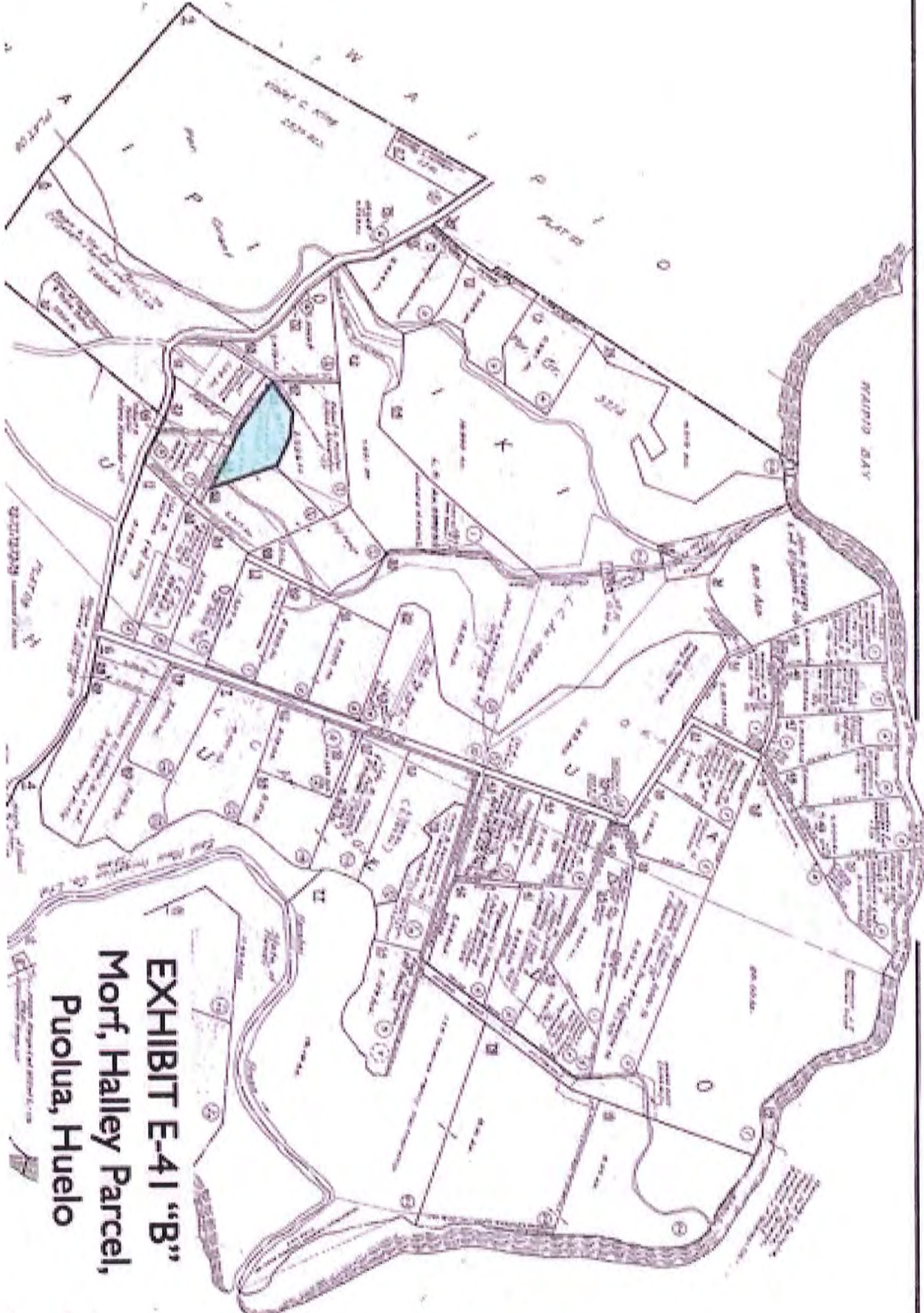
GRANTOR : DONALD MACDOUGAL HALLEY, JR., husband of Christa Morf

GRANTEE : DONALD MACDOUGAL HALLEY, JR., Trustee of the Donald MacDougal Halley, JR. Revocable Living Trust dated July 7, 2004

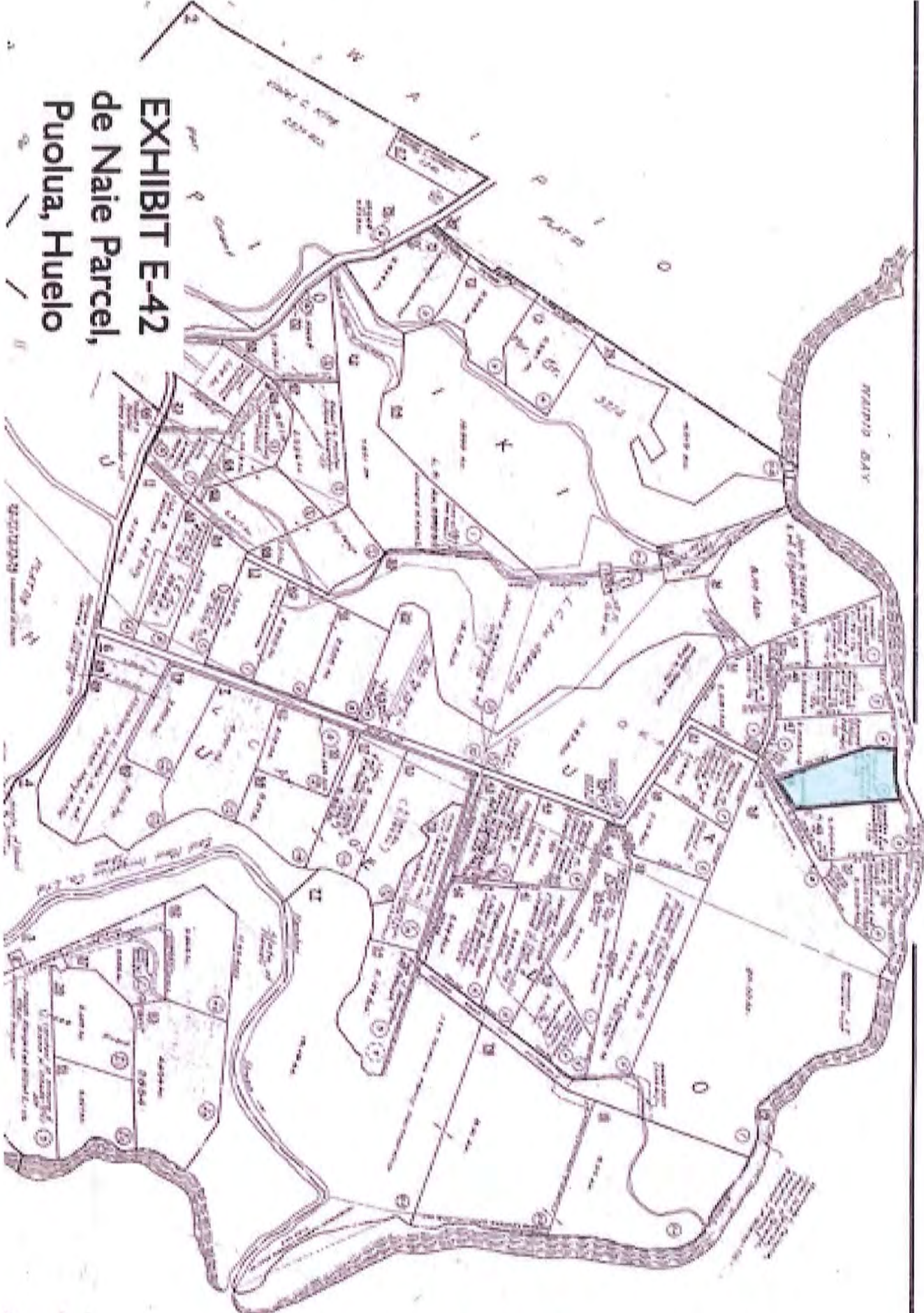
DATED : July 7, 2004

RECORDED : Document No. 2004-215986

Subject to any and all liens and/or encumbrances of record.



**EXHIBIT E-41 "B"**  
**Morf, Halley Parcel,**  
**Puolua, Huelo**



**EXHIBIT E-42**  
**de Naie Parcel,**  
**Puolua, Huelo**

Scale 1" = 100'

## **Analyses of Errors Found in Sections 13.1 and 13.2 of the September 2008, CWRM IFSAR for Hanehoi Hydrological Unit in Huelo, Maui**

Research by Lucienne de Naie , December 26, 2014

### **BACKGROUND:**

State Water Commission staff photographed the various diversions found along the EMI Ditches in the Hanehoi Hydrological Unit for the Hanehoi IFSAR. These were compiled in sections 13.1-2 of the September 2008 Hanehoi IFSAR, and labeled, using information supplied by EMI staff. Sections 13.1-2 of the IFSAR do show photographs of all diversions in the Hydrological Unit on pp. 85 to 99 but many are mislabeled as to function, location and stream names.

The IFSAR maps indicate that in the Hanehoi Hydrological Unit there are two “major” EMI diversions on New Haiku Ditch; three on Lowrie Ditch; one on New Hamakua and two on Wailoa Ditch, for a total of seven major diversions. **Actually there are eight major diversions, with four of them being along the Lowrie Ditch.**

The Lowrie ditch also has several more “minor diversions” of natural spring seepages that are directed into the ditch. Since the entire Huelo community depends upon the lower flows of the Hanehoi or Puolua stream, this extreme dewatering of the Hanehoi and its tributaries along the Lowrie Ditch has a profound affect on the community’s access to water to satisfy domestic and kuleana uses as well as recreational uses and traditional gathering. It needs to be accurately documented.

The problem appears to have begun with the inaccurate baseline maps for the area that only indicate two streams: Hanehoi and Puolua, and do not accurately portray either the various branches of these streams or the third stream found in the area: Huelo Stream. Huelo stream is mistakenly used as an alternate name for “Puolua” stream, but they are completely separate streams.



This information should be corrected as part of the CWRM submissions for the East Maui Stream Flow Standards Contested Case to be heard in 2015. These are not minor errors, but substantial omissions of important information. I am concerned that if the Commission and staff relies on such inaccurate information about the most basic nature of the water withdrawals from the Hanehoi area, they will not be basing their decisions on the real facts of the case. Since no stream by stream diversion figures are provided by EMI, the location and nature of their diversions is an important source of information to estimate specific diversion rates in the Hanehoi Unit and what needs to be restored to allow for Public Trust purposes to be met.

Below are some examples of the inaccurate information presented in Hanehoi IFSAR, Section 13.1-2. All page numbers refer to the Hanehoi September 2008 IFSAR.

As noted in the summary: five of the six majors diversions presented are not accurately described and/or located.

- **Diversion L-7a** on p. 98 of IFSAR describes a “minor diversion” on “Hanehoi” stream at the Lowrie ditch called the “Roseapple diversion.”

**This is actually the major diversion on Puolua stream, not Hanehoi, at the Lowrie ditch. It is a major diversion because it intercepts the entire flow of the Puolua stream except for what two deteriorating 4” pipes can return to the stream.** Puolua stream is diverted again further makai by the New haiku Ditch. No other “minor diversions” are diverted twice.

The pipes from Puolua stream crossing the ditch have been visited by CWRM staff with Ernie Schupp a number of times, since Mr. Schupp depends upon those pipes for his kalo lo’i below Hana Highway to receive stream flow below Haiku Ditch. This diversion does not have a substantial structure, but it does divert a substantial amount of water. It should be recognized as a “major diversion” by volume and should be relabeled as a major diversion on CWRM maps.

- **Reg Intake 155.6** on p. 85. This intake is described as the “L-7 intake” on Hanehoi Stream (or Huelo #3 Intake) into the Lowrie Ditch. It is shown on map Fig 13-9 of registered EMI diversions in the IFSAR on p. 117 as located where Puolua stream intersects Lowrie Ditch. This diversion actually appears to be on the West branch of Huelo stream, which is located around 1000 m. east of Puolua stream. Since Huelo stream is thought by CVWRM to be the same as “Puolua” stream, the location was misgauged.
- **Reg. intake 242.6** is one of the intake locations that is mislabeled as to stream names or location. On p. 91 of the IFSAR this intake is described as being on “Hanehoi Stream.” This intake is actually on what appears to be the East branch of Huelo Stream. The text also indicates that this is where the Huelo community water pipe is located, as well as two 3” pipes that allow some flows to bypass the Lowrie diversion, which is definitely not accurate. The Huelo Community water pipe and the two bypass pipes are located on the East Hanehoi stream at intake number 240.6. (see below) It appears that the description for intake 240.6 was somehow assigned to intake 242.6.
- **Intake 240.6** on p.90 of the IFSAR. No mention is made of the Community pipe at this intake description, or the pipes that bypass the diversion and return a small amount of water to the East Hanehoi Stream, yet this is the major diversion on the whole Hanehoi system, with its capacity stated at 6 mgd in the description on p. 90. Its description should be made accurate and proper photos provided.
- **intake 225.6** on the Haiku Ditch, shown on pp. 88-89 of the IFSAR is described as diverting the “West Hanehoi Stream” when actually this is the intake for the **Puolua Stream**. This diversion, just upstream from Mr. Schupp’s kalo lo’i has been visited many times by CWRM and DAR staff. Photos shown on p. 89 of the IFSAR are from the 2008 DAR report on Hanehoi stream and these photos are clearly labelled as being of “Puolua stream” in the DAR report.

All the references above can be found in the cited pages of the September 2008 Hanehoi IFSAR which is presented as Maui Tomorrow's Exhibit E-32 and of course, available in CWRM files.

In summary: the CWRM September 2008 IFSAR describes four EMI diversions on the Lowrie Ditch, and two on the New Haiku Ditch. Five of the six diversions are either described as being located on the wrong stream or in the wrong location. Only ONE of the six diversions was correctly located. The addition of Huelo stream to CWRM maps could help clear up some of the confusion, as well as field checking information with community members.

## **Comments on Stream Locations in Hanehoi Final IFSAR, September, 2008**

Prepared by Lucienne de Naie, Water Resource Researcher and Huelo Resident  
First prepared: October 31, 2009 for submission to CWRM. Updated, Dec. 2014

To accompany Exhibit 40 Map of true locations of Hanehoi stream and its tributaries:  
Huelo and Puolua stream

### **The Three Streams of Hanehoi Hydrological Unit**

Figure 1.4 in the Hanehoi report does not accurately portray the 3 streams and their tributaries which make up the hydrological unit. There are three named streams with various branches. The named streams are: HANEHOI, HUELO and PUOLUA. "Huelo" stream is not the same as "Puolua" stream. Both begin around the 1,000 ft elevation and both eventually join Hanehoi stream which originates considerably higher. The main difference is:

Huelo stream flows into the west branch of Hanehoi stream, then that west branch joins the east branch to form the main body of Hanehoi stream. All of this takes place ABOVE (mauka) of the New Haiku Ditch.

The Puolua stream joins into Hanehoi stream after the other tributaries have merged. It joins the Hanehoi stream BELOW the New Haiku Ditch, since it is separately diverted by that ditch.

Huelo stream has two branches: east and west and a number of other smaller tributaries. One branch has a diversion structure at Lowrie ditch. The two branches of Huelo stream join as one below Lowrie ditch and the single branch runs into Hanehoi stream a few hundred feet above (mauka) of the New Haiku ditch. It is very likely that the New Haiku ditch was structured to be immediately down stream of this confluence. Huelo stream bed is very overgrown and "swampy" just mauka of Hana highway but it has groves of hala and kukui along its banks, a few ulu trees and has evidence of former kalo cultivation in the vicinity of LCA 545- F:1. Land claims were made along Huelo stream in the Kingdom days.

Puolua stream also has an east and a west branch but they join before the stream is tapped at Lowrie ditch. Puolua is diverted again at the lower Haiku ditch (below/makai) of Hana Hwy. After being diverted by Haiku ditch the stream travels further makai and joins with Hanehoi stream. Puolua has a number of LCA parcels along its whole length and several poalima or kalo patches used to grow kalo for the konohiki or chief. There are hala and ulu trees along Puolua stream as well as extensive kalo terraces, house platforms and a heiau. All this is evidence that the land was occupied and farmed in pre-contact times.

When it has water, Puolua is a major source of flow for the section of Hanehoi stream below the Haiku ditch where Solomon Lee, The Lapenia/ Lukela 'ohana and Neola Caveny have their lands.

Hanehoi stream has two branches, west and east. Both branches have major EMI diversions at Lowrie ditch. The Hanehoi east branch has the Huelo community water pipe located in a perennial pool a few hundred feet above the Lowrie ditch diversion dam. Two 4" PVC pipes travel under the diversion sluiceway and carry a small amount of water back into a spillway that leads to the stream. They often leak a portion of the water back into the ditch. The arrangement is very inefficient and does not allow for any streamlife migration.

The east and west branches of Hanehoi stream also join below Hana Hwy. Huelo stream also joins Hanehoi below (makai) of Hana Hwy, as noted above.

Please find Exhibit 40 map illustrating the more correct locations of these three streams. It is based on Reg. Map 2745, c. 1925-26 created by EMI to show land holdings in the Huelo-Hanehoi area.

OCEAN

PLAT 06

Huelo stream

East Maui Irrigation Co., Ltd.  
2500000000

W. Hanehoi stream

East Maui Irrigation Co., Ltd.  
2500000000

E. Hanehoi stream

Junction of  
Hanehoi and  
Huelo streams  
by New Haiku  
Ditch

EXHIBIT E-45

TMK Map (2) 2-9-009

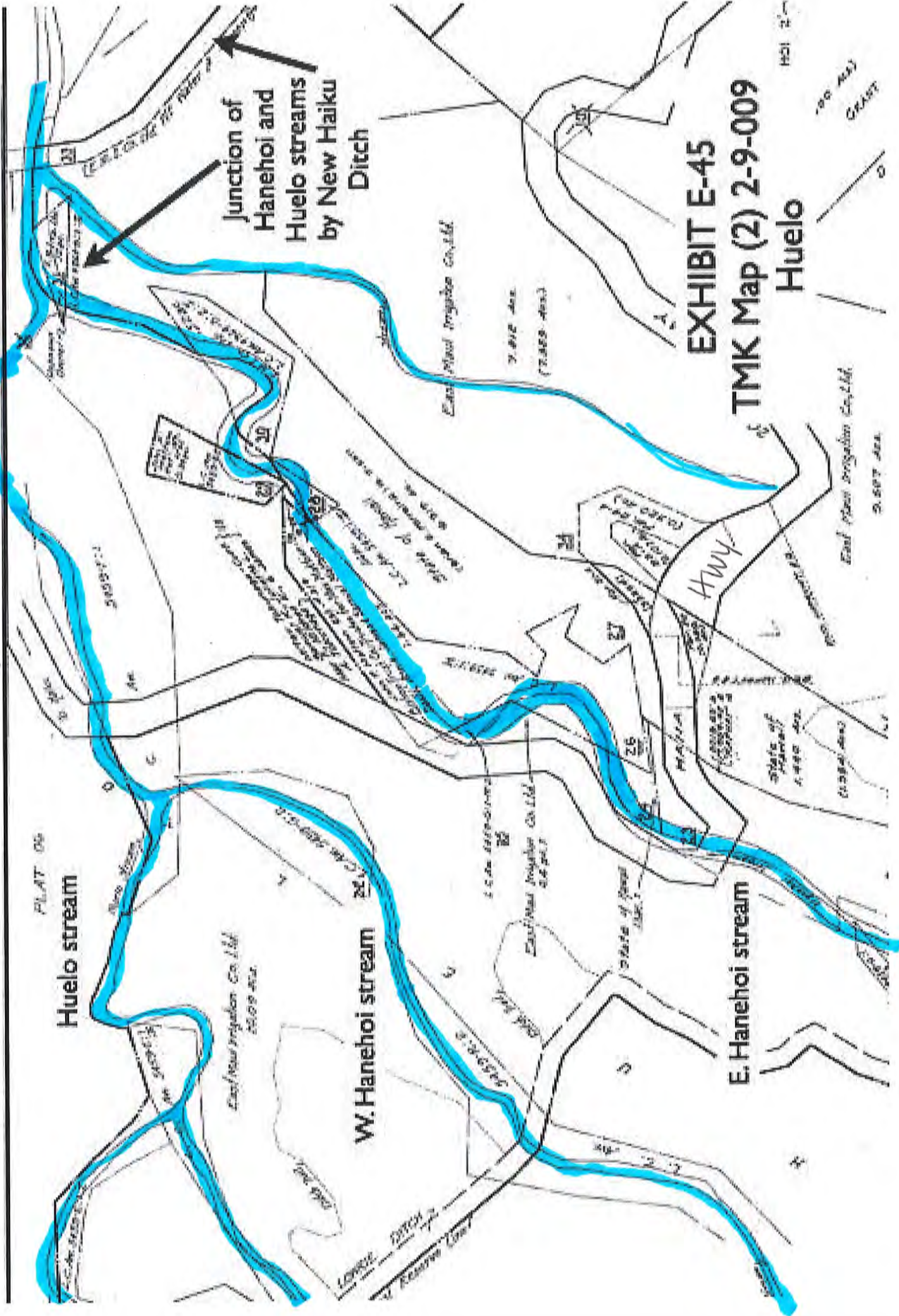
Huelo

NOI 21

100 A&S  
CRUST

East Maui Irrigation Co., Ltd.  
2500000000

Hwy



**A**



**Huelo  
Community  
water pipe  
located in E.  
Hanehoi stream  
above Lowrie  
diversion**



**B**

**EXHIBIT E-46 "a" & "b"**



C

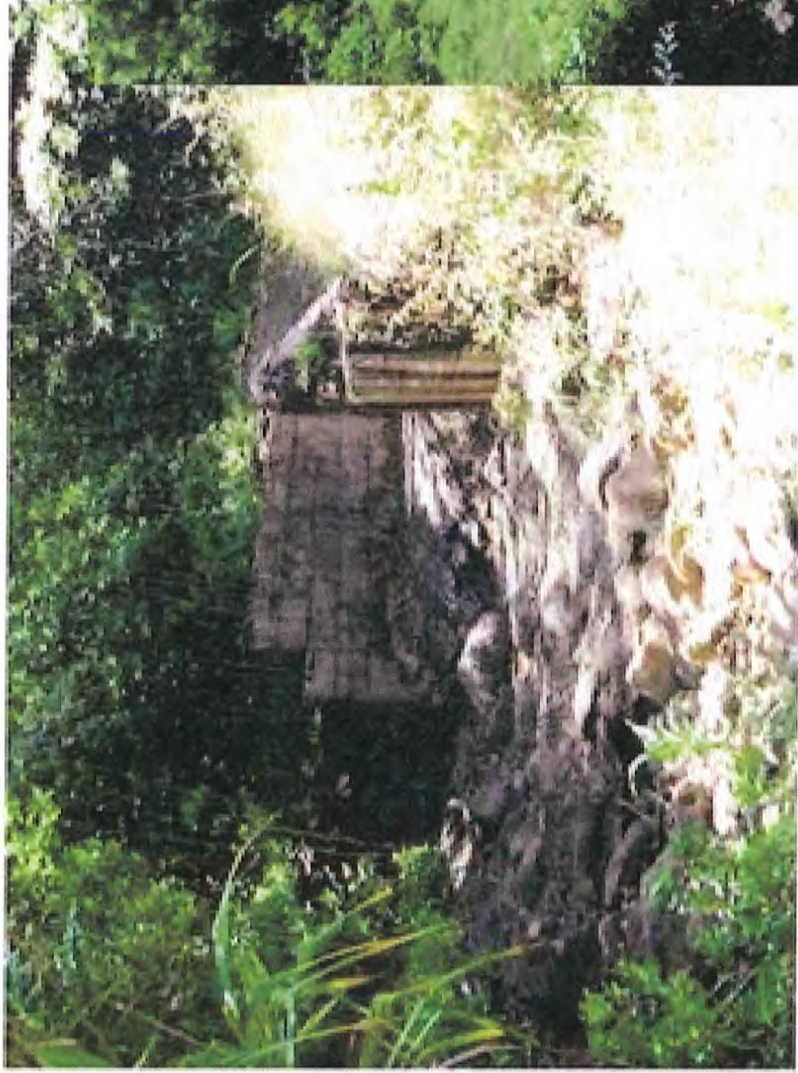


D

**EXHIBIT E-46**  
**“c” & “d”**  
**Hanehoi stream**  
**above Hana Hwy**  
**on EMI land-**  
**note overgrown**  
**conditions 2010**



**E**



**F**

EMI diversions  
on Huelo & W.  
Hanehoi stream  
leave streams dry  
april 2013

EXHIBIT E-46 "E" & "F"

Commissioner Frazier said that the maintenance of the waterways wasn't addressed as to who is responsible to make sure the waterways are maintained and that water does not get lost along the way. Chair Thielen asked if Commissioner Frazier was referring to the diversions through the ditches or downstream of the ditches where the stream is losing water. Commissioner Frazier responded that he meant within the waterway itself, no seep holes or areas where water would be lost.

Chair Thielen mentioned that this was not raised in the hydrologic units where there are losing streams however this is a gaining stream. She asked if there were other areas where it is addressed in the recommendations. Dean Uyeno asked Commissioner Frazier if he is referencing stream maintenance in general and Commissioner Frazier said not auwai as much as streams from mauka to makai. Mr. Uyeno responded that there is a law in place that states that it is the property owner's responsibility to maintain stream channels. Deputy Kawahara said since this is a gaining stream and was not covered, the submittal on page 49, Waiokamilo's second bullet point under Adaptive Management Strategy reads, "Taro farmers, in coordination with staff, should repair and maintain coffer dams upstream of Dam 3 to redirect flow away from portions of the stream channel that appear to be losing flow underground." Deputy Kawahara said that recommendation is made in other hydrologic units.

Chair Thielen said Commissioner Frazier was raising a point of general stream maintenance. She suggested that perhaps later in the deliberation phase some modifications of the adaptive management be identified to clear out streams.

Commissioner Kiyosaki asked how often periodic flow measurements will be done. Deputy Kawahara said it was mentioned earlier today about funding, and mentioned that they have been fortunate that the legislature and the administration appropriated \$450,000 in the past two years. It is unsure how much money the commission would get in next year's budget. Deputy Kawahara did not want to make a commitment or to make guarantees that wouldn't be carried out. Deputy Kawahara explained that there is an annual cooperative agreement with USGS on stream gages and ground water monitoring wells. However, the number of stations was decreasing due to the lack of funding over the past two years.

Chair Thielen also added that there was an earlier discussion with USGS to see if there was a way to work with the federal government because a portion of USGS funding was decreased to these monitoring wells. USGS can fund up to 50% and it has dropped down below that. Chair Thielen said that depending on the decision today, the Commission would prioritize what needed to be done in this area to be able to meet this obligation.

Presentation of Hanehoi:

Elise Leroux reported on the Assessment Summary and Additional Considerations.

Dean Uyeno reported on the Proposed Interim IFS and Rationale.

Chui Cheng reported on the Hydrologic Unit: Stream System Schematic Diagram and the Hydrologic Unit: Current and Proposed Interim IFS Diagram.

Dean Uyeno reported on the Proposed Adaptive Management Strategy for Hanehoi hydrologic unit.

Commissioner Miike noted that staff had not proposed an interim IFS below the lowest diversion on Hanehoi Stream, but he understood that the IFS was in fact, being proposed below the last diversion.

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**Instream Flow Standard Assessment Report**  
**Island of Maui**  
**Hydrologic Unit 6047**  
**Waikamoi**

December 2009

PR-2009-01

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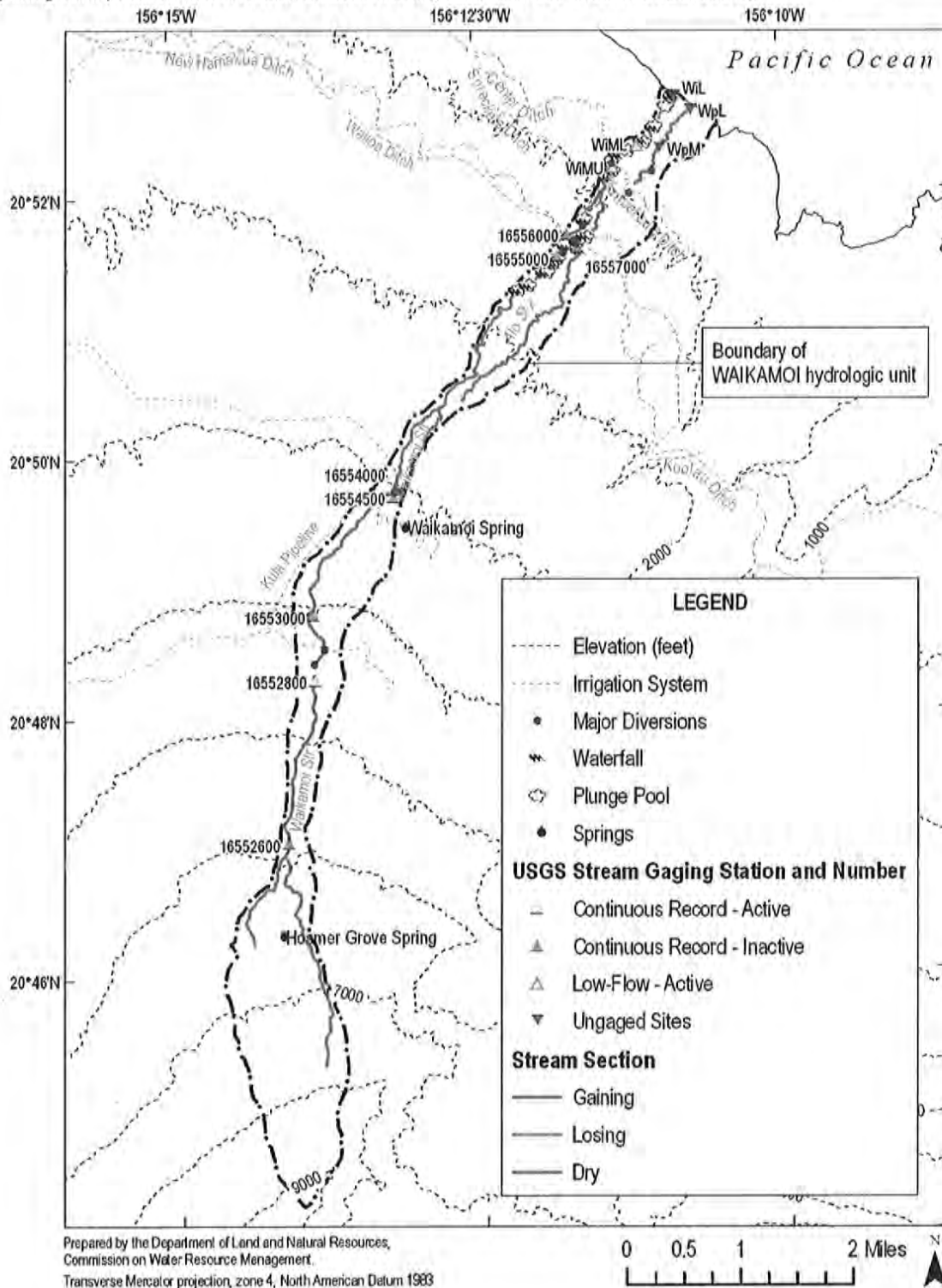
**State of Hawaii**  
**Department of Land and Natural Resources**  
**Commission on Water Resource Management**



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**EXHIBIT E-48**

**Figure 3-3.** Location of diversions, irrigation systems, USGS gaging stations, and selected ungaged sites in Waikamoi hydrologic unit (Source: State of Hawaii, Office of Planning, n.d.; 1996, 2004c; 2005; USGS, 2001b).



Large waterfalls are obvious “bottlenecks” in the stream ecosystem that restrict the upstream migration of most native aquatic species, except the alamo and opae. These species have fused pelvic fins and the musculature for climbing high vertical walls and inhabiting the upper stream reaches. Therefore, streams with terminal waterfalls may harbor a lower diversity of native aquatic species than those without. On the other hand, terminal estuaries and pools downstream of waterfalls are known to carry a diversity of native species and are ideal spots for traditional gathering.

Irrigation ditches serve as lateral conduits between watersheds, which may contribute to the spread of both native and alien species. The Commission does not condone the release of ditch flows as the correct means of flow restoration, but rather have streamflow bypass the diversion structure and continue to flow downstream. However, streams may be used to convey diverted flow from one ditch to another, introducing alien species from one stream to another. Furthermore, overflow in the ditch could also introduce invasive species into the stream. The potential for introducing species from invasive-dominated terminal reaches to native-dominated mid- and headwater reaches is not a major problem in east Maui due to the presence of large waterfalls. Ford et. al. (2009) discussed how ditches may also be “sinks” where “larvae cannot reach the sea and/or where recruits may not survive to reproduce.” This is especially the case when native amphidromous species inhabit waters upstream of the ditches. The location and types of diversion structure also affect the ability of ability of amphidromous species to migrate upstream.

Diversions have significantly reduced baseflows in the stream, limiting overall habitat for native species. While restoration of streamflow and increased connectivity could lead to the development of a richer and more native-dominated community in the stream, many other factors must also be considered in balancing the benefits of flow restoration to overall stream life versus providing water for agricultural and domestic uses. In addition to dewaterment, predation by native and non-native animals is also an important negative impact on the distribution of the native aquatic species. Some of the potentially harmful non-native species in east Maui include guppies, mosquitofish, swardtails, carp, oriental weatherfish (dojo), goldfish, Louisiana crayfish, apple snails (harmful to taro), and Asian clam (Ford et. al., 2009). In addition, the “aholehole are known to attack nests of goby eggs and may also consume returning post-larval gobies” (as cited in Ford et. al., 2009). Irrigation ditches may contribute to the spread of alien species; on the other hand, they aid in dispersing the native aquatic species, strengthening the overall population and continued survival of the native freshwater species.

Another factor that affects the distribution of native species is the condition of the streambed. Stream channels are often overgrown with alien grasses and shrubs. Vegetation along the stream bank has exposed roots that take up large amounts of water when sufficient flow is in the stream. Thus, during a high flow event, streams that are normally dry become only partially wetted because invasive plants and water thirst roots eventually absorb much of the water. In addition, fallen trees and other debris are found to block sections of the stream, which may reduce streamflow and even divert flow away from the main stream channel in the long term. Without proper maintenance of the streambed, restored streamflow in the upper elevations may not reach the ocean. Plans to rebuild healthy streambeds should be considered to help maximize the flow in the stream.

As stated in Ford et. al. (2009), the “synergistic effects of human alterations have led to a decline in the populations of native freshwater species statewide.” Streamflow has also decreased over the past decade (see Section 3.4) and this has resulted, as generally believed, in less native stream species. While traditional gathering continues in east Maui, area residents are limited to certain areas with adequate streamflow to gather these resources (multiple residents in east Maui, personal communication, October 2008). Streams in east Maui are recognized as important habitats for native Hawaiian stream animals (Gingerich and Wolff, 2005). The maintenance, or restoration, of stream habitat requires an understanding of and the relationships among the various components that impact fish and wildlife habitat, and ultimately, the overall viability of a desired set of species. These components include, but are

**Table 4-7.** Known distribution of amphidromous species in east Maui streams (Ford et. al., 2009, Table 3).

[X = present; ND = no data]

East Maui Streams (T) = terminal falls	<i>Kunia</i> sp.	<i>Electris</i> <i>sandwicensis</i>	<i>Stenogobius</i> <i>hawaiiensis</i>	<i>Awaous</i> <i>guamensis</i>	<i>Sicyopterus</i> <i>-stimpsoni</i>	<i>Lentipes</i> <i>concolor</i>	<i>Nannina</i> <i>granosa</i>	<i>Meritina</i> <i>vespertinus</i>	<i>Macrobrachium</i> lar (Allen amphidromous)	<i>Macrobrachium</i> <i>grandimanus</i>	<i>Atylota</i> <i>bisulcata</i>
Honopou		X		X	X	X			X	X	X
Hanehōi											X
Kolea (T)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Waikamoi (T)									X		X
Whinepe'e (T)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Haioua'ena (T)				X	X	X			X		X
Puohokamao				X	X	X			X		X
Punalau				X	X	X			X		X
Honomanū											X
Nua'aialua				X	X	X	X	X	X		X
Palauhulu/Pi'ina'au	X	X	X	X	X	X	X	X	X	X	X
'Ohia							X				X
Waiokeamilo (T)				X					X		X
Wailua Nui	X	X		X		X			X		X
W. Wailua Iki	X			X		X	X		X		X
E. Wailua Iki	X	X		X		X	X		X		X
Kopiliula	X	X		X	X	X	X		X		X
Waiohuc	X	X	X	X	X	X	X	X	X	X	X
Pa'akea (T)				X		X	X		X		X
Kapaula											X
Hanawi	X	X	X	X	X	X	X		X		X
Makapipi	X	X	X	X	X	X	X		X		X

Since changes to streamflow and stream configurations have raised concerns regarding their impact to on-shore and near-shore activities, the Commission attempted to identify these various activities in relation to Waikamoi and Wahinepee Stream. A 1981 Maui Resource Atlas, prepared by the State of Hawaii Department of Transportation's Harbors Division, inventoried coral reefs and coastal recreational activities. Looking at available GIS data, the Commission identified trolling/bottom fishing, and opihi picking as the only activities that were known to occur or observed at or near Waikamoi (Figure 5-2).

John Clark, in his book *The Beaches of Maui County* (1989), describes the Waikamoi area as follows:

The shoreline from Maliko to Honomanū is characterized by high, steep sea cliffs. Within this long reach of cliffs are a number of bays that are usually little more than wide, moderately deep indentations in the shoreline, usually where streams meet the ocean. The beaches in these areas are narrow stretches of large boulders lying directly at the base of the sea cliffs. Many of these boulder beaches are not accessible at all by land, and if they are, it is only by a hazardous climb using a rope or cable to get down the cliffs. During the winter and spring months these bays are assaulted by heavy surf that sweeps completely across the boulders against the sea cliffs. There are no fringing reefs to check the advance of surf or strong currents. Over the years many fishermen have lost their lives along this dangerous coastline. These rough waters have long been excellent grounds for netting *akule* and *'ōpelu* and for hooking *'ū'ū*, *'āweoweo*, and *āhole*.

There is no public access to any of these shoreline areas except from the ocean. Many of the bays are over one mile away from the Hāna Highway, and all of the land between the highway and the shoreline is private property replete with locked gates and No Trespassing signs.

Another element of recreation is the unique educational opportunities that streams provide for nature study. One way to approach this is to identify established study sites or nature centers that offer structured learning programs. In lieu of that, the Commission considered available GIS data to identify schools in proximity to Waikamoi and Wahinepee Stream that may utilize the stream as part of its curriculum. Although the Commission did not identify any educational facilities in the area, the Sierra Club Maui Group has been hosting education hikes along the Waihinepee Trail at the 600 feet elevation for over two decades (PR-2009-18, 85.0).

See Figure 5-2 for the locations of various recreation-related points of interest. It is important to note that the recreational activities are not limited to the ocean as the figure may suggest. The stream and the surrounding areas are also used for recreational purposes (e.g., hiking, swimming).

**Table 6-1. Hawaii Stream Assessment indicators of riparian resources for Waikamoi Stream.**

Category	Value
<p>Listed threatened and endangered species:                      These species are generally dependent upon undisturbed habitat. Their presence is, therefore an indication of the integrity of the native vegetation. The presence of these species along a stream course was considered to be a positive attribute; with the more types of threatened and endangered species associated with a stream the higher the value of the resource. Only federally listed threatened or endangered forest or water birds that have been extensively documented within the last 15 years were included.</p>	3
<p>Recovery habitat:                      Recovery habitat consists of those areas identified by the USFWS and DLNR as essential habitat for the recovery of threatened and endangered species. Streams that have recovery habitat anywhere along their length were included.</p>	None
<p>Other rare organisms and communities:                      Many species that are candidates for endangered or threatened status have not been processed through all of the requirements of the Endangered Species Act. Also a number of plant communities associated with streams have become extremely rare. These rare organisms and communities were considered to be as indicative of natural Hawaiian biological processes as are listed threatened and endangered species.</p>	None
<p>Protected areas:                      The riparian resources of streams that pass through natural area reserves, refuges and other protected areas are accorded special protection from degradation. Protected areas were so designated because of features other than their riparian resources. The presence of these areas along a stream, however, indicates that native processes are promoted and alien influences controlled.</p>	Partially protected
<p>Wetlands:                      Wetlands are important riparian resources. They provide habitat for many species and are often important nursery areas. Because they are often extensive areas of flat land generally with deep soil, many have been drained and converted to agricultural or urban uses. Those that remain are, therefore, invaluable as well as being indicators of lack of disturbance.</p>	Less than 1/2-square mi. of palustrine wetlands identified by USFWS
<p>Native forest:                      The proportion of a stream course flowing through native forest provides an indication of the potential "naturalness" of the quality of a stream's watershed; the greater the percentage of a stream flowing through native forest most of which is protected in forest reserves the more significant the resource. Only the length of the main course of a stream (to the nearest 10 percent) that passes through native forest was recorded.</p>	30%
<p>Detrimental organisms:                      Some animals and plants have a negative influence on streams. Wild animals (e.g., pigs, goats, deer) destroy vegetation, open forests, accelerate soil erosion, and contaminate the water with fecal material. Weedy plants can dramatically alter the nature of a stream generally by impeding water flow. Three species, California grass, hau, and red mangrove, are considered to have the greatest influence. The presence of any of these animals or plants along a stream course was considered a potentially negative factor, while the degree of detriment is dependent on the number of species present.</p>	2 (Hau, Pigs)

For the purpose of this section, management areas are those locales that have been identified by federal, state, county, or private entities as having natural or cultural resources of particular value. The result of various government programs and privately-funded initiatives has been a wide assortment of management areas with often common goals. Such designated areas include forest reserves, private preserves, natural area reserves, wildlife sanctuaries, national parks, historic landmarks, and so on. In Waikamoi, about 29 percent of the hydrologic unit falls within the Haleakala National Park, 28 percent within the Koolau Forest Reserve, and 7 percent within the Waikamoi Preserve (Table 6-2).



lichens, or wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 percent.

**Table 6-4.** Wetland classifications for Waikamoi hydrologic unit (Source: U.S. Fish and Wildlife Service, 1978).

System Type	Class	Regime	Area (mi <sup>2</sup> )	Percent of Unit
Palustrine	Forested, broad-leaved evergreen	Semipermanent non-tidal	1.05	20.0
Palustrine	Forested, broad-leaved evergreen	Seasonal/Unknown non-tidal	0.26	4.9
Palustrine	Open Water/unknown bottom	Permanent non-tidal	0.01	0.2
Palustrine	Scrub/shrub, broad-leaved evergreen	Seasonal/Unknown non-tidal	0.35	6.7

A series of vegetation maps describing upland plant communities was prepared as part of a USFWS survey in 1976 to 1981 to determine the current status of native forest birds and their associated habitats. Table 6-5 and Figure 6-3 present the portion of the hydrologic unit (~1000 feet above mean sea level) that was surveyed and the degree of disturbance of native forest. Approximately 39 percent of the unit is predominately native species with little or no alien species.

**Table 6-5.** Distribution of native and alien plant species for Waikamoi hydrologic unit. (Source: Jacobi, 1989).

Canopy Type	Area (mi <sup>2</sup> )	Percent of Unit
Communities totally dominated by native species of plants	2.06	39.3
Communities that have the dominant vegetation layer occupied by native species and the subdominant layer primarily occupied by exotic species	0.18	3.3
Communities dominated by introduced species but contain remnant populations of native species; no native community structure remaining	0.12	2.2
Communities that are totally dominated by introduced plants; virtually no native species remaining	0.53	10.1
Non-vegetated areas or disturbance not determined	0.14	2.6
Unknown	1.25	23.9

Based upon the current designations, the Waikamoi hydrologic unit contains critical habitat areas for ten plant species (Table 6-6). While critical plant habitats are more prominent above the 1,300 feet altitude, the area around 600 feet elevation and along the Wahinepee Trail has a good representation of native endemic plants (PR-2009-18, 85.0). The Sierra Club Maui Group has lead educational hikes in this area for over two decades.

**Table 6-6.** Percentage of critical habitat areas for Waikamoi hydrologic unit (Source: State of Hawaii, Office of Planning, 2004b).

Scientific Name	Common/Hawaiian Name	Description	Area (mi <sup>2</sup> )	Percent of Unit
<i>Argyroxiphium sandwicense ssp. macrocephalum</i>	Silversword, 'Ahinahina	Plant	0.76	14.6
<i>Asplenium fragile var. insulare</i>	No common name	Plant	< 0.01	< 0.1
<i>Brighamia rockii</i>	Pua 'ala	Plant	0.01	0.2
<i>Cyanea copelandii ssp. haleakalaensis</i>	Haha	Plant	0.12	2.3
<i>Cyanea hamatiflora ssp. hamatiflora</i>	No common name	Plant	0.87	16.7
<i>Cyanea mceldowneyi</i>	No common name	Plant	0.80	15.2
<i>Diplazium molokaiense</i>	No common name	Plant	0.21	3.9
<i>Geranium multiflorum</i>	Nohoanu	Plant	0.03	0.6
<i>Phlegmarium mami</i>	Wawac'iole	Plant	0.01	0.1
<i>Phyllostegia mami</i>	No common name	Plant	0.46	8.8

The density of threatened and endangered plant species is high at elevations above 1,300 feet, while the rest of the Waikamoi hydrologic unit, roughly 15 percent, has a low concentration of threatened and endangered plant species at lower elevations (Table 6-7 and Figure 6-4).

**Table 6-7.** Density of threatened and endangered plants for Waikamoi hydrologic unit. (Source: State of Hawaii, Office of Planning, 1992).

Density	Area (mi <sup>2</sup> )	Percent of Unit
High concentration of threatened and endangered species	4.44	84.6
Low concentration of threatened and endangered species	0.81	15.4

A current working paper is being developed by the University of Hawaii's Economic Research Organization (UHERO), entitled *Environmental Valuation and the Hawaiian Economy*, which discusses the use of existing measures of economic performance and alternative statistical devices to provide an economic valuation of threatened environmental resources. The paper focuses on the Koolau, Oahu watershed and illustrates three categories of positive natural capital (forest resources, shoreline resources, and water resources) against a fourth category (alien species) that degrades natural capital. In the case of the Oahu Koolau forests, a benchmark level of degradation is first defined for comparison against the current value of the Oahu Koolau system. The Oahu Koolau case study considers a hypothetical major disturbance caused by a substantial increased population of pigs with a major forest conversion from native trees to the non-indigenous *Miconia (Miconia calvescens)*, along with the continued "creep" of urban areas into the upper watershed (Kaiser, B. et al., n.d.).

Recognizing that in the United States, the incorporation of environmental and natural resource considerations into economic measures is still very limited, the paper provides the estimated Net Present Value (NPV) for "Koolau [Oahu] Forest Amenities." These values are presented in Table 6-8.

**Table 6-8.** Estimated Net Present Value (NPV) for Koolau (Oahu) Forest Amenities (Source: Kaiser, B. et al., n.d.).

Amenity	Estimated Net Present Value (NPV)	Important limitations
Ground water quantity	\$4.57 to \$8.52 billion NPV	Optimal extraction assumed.
Water quality	\$83.7 to \$394 million NPV	Using averted dredging cost estimates.
In-stream uses	\$82.4 to \$242.4 million NPV	Contingent valuation estimate for a single small fish species.
Species habitat	\$487 to \$1,434 million NPV	Contingent valuation estimate for a single small bird species.
Biodiversity	\$660,000 to \$5.5 million NPV	Average cost of listing 11 species in Koolaus.
Subsistence	\$34.7 to \$131 million NPV	Based on replacement value of pigs hunted.
Hunting	\$62.8 to \$237 million NPV	Based on fraction of hunting expenditures in state. Does not include damages from pigs to the other amenities.
Aesthetic values	\$1.04 to \$3.07 million NPV	Contingent valuation; Households value open space for aesthetic reasons.
Commercial harvests	\$600,000 to \$2.4 million NPV	Based on small sustainable extraction of koa.
Ecotourism	\$1.0 to \$2.98 billion NPV	Based on fraction of direct revenues to ecotourism activities.
Climate control	\$82.2 million	Based on replacement costs of contribution of all tropical forests to carbon sequestration.
<b>Estimated value of joint services:</b>	<b>\$7.444 to \$14.032 billion</b>	

Following upon the results of the Oahu Koolau case study, the paper provides a brief comparison with the east Maui forests, noting the particular importance of the east Maui watershed as the single largest source of surface water in the state, home to some of the most intact and extensive native forests left in Hawaii, along with having the State's largest concentration of endangered forest birds. In both cases, the Oahu Koolaus and east Maui, the most valuable aspects of the forested areas are believed to be ecotourism, aesthetic pleasure, species habitat, water quality, and water quantity. Both regions are roughly the same

licenses into a single license. In 1986, Native Hawaiian Legal Corporation (NHLC) challenged the Department of Land and Natural Resources (DLNR)'s decision that an Environmental Impact Statement (EIS) was not required and an Environmental Assessment (EA) was sufficient for the issuance of the 30-year lease. The Circuit Court agreed that an EA was adequate, and NHLC appealed to the Supreme Court, who remanded back to Circuit Court to conduct a hearing pursuant to HRS section 343-7(b) on the matter. Further discussions resulted in several decisions, including that the Board of Land and Natural Resources (BLNR) and DLNR must work towards long-term resolution; and that interested parties work together to develop a watershed management plan for the water lease areas. The latter resulted in the creation of the East Maui Watershed Partnership and development of the East Maui Watershed Management Plan.

In 1987, the rate structure of the revocable permits was altered to a fixed flat fee independent of the amount of water diverted by A&B, and the rates were reduced by 25% to discount for the uncertainty that the annual permits would be renewed. However, the payments after 1987 were increased by 25% to remove the discount and convert the rates to long-term lease rentals. In 1988, the State performed an independent audit and set the benchmark rate based on the audit rate of five dollars per million gallons. In fiscal year 1999-2000, the permits were issued to A&B and EMI, with the fixed rates based on an assumed annual flow. The current revocable permits state that their rates are based on a staff appraisal dated May 7, 2001.

The revocable permits are currently regulated by the DLNR's Land Division, which collects fees for the permits. Those permits were most recently renewed in November 2007, with the following rental payments:

**Table 13-8.** Current revocable permits issued to A&B/EMI.

Revocable Permit No.	License Area	Area (acres)	Monthly Rent in 2008
S-7264	Huelo	8,752.69	\$6,588
S-7263	Honomanu	3,381.00	\$1,698
S-7265	Keanae	10,768.00	\$3,477
S-7266	Nahiku	10,111.22	\$1,427

In May 2001, A&B and EMI filed an Application for a Long Term Water License with the BLNR seeking a long-term 30-year lease rather than continue with year-to-year revocable permits. Shortly thereafter, Na Moku Aupuni O Koolau Hui, Inc. ("Na Moku") and Maui Tomorrow requested a contested case hearing, with NHLC filing on behalf of petitioners Na Moku, Elizabeth Lapenia, Beatrice Kekahuna, and Marjorie Wallett. (In May 2007, Elizabeth Lapenia withdrew from the case and is no longer represented in it.) Concurrently, the Petitioners filed with the Commission a Petition to Amend the Interim Instream Flow Standard for 27 Streams in East Maui.

In May 2002 the BLNR deferred the reissuance of interim revocable permits and granted a holdover of the existing revocable permits on a month-to-month basis pending the results of the contested case hearing. A January 2003 BLNR "Findings of Fact and Conclusions of Law and Order" indicates that the "BLNR may enter into a lease of water emanating from State lands for transfer outside of the watershed of origin provided that such lease is issued in accordance with the procedures set forth in HRS Chapter 171 and provided that all diversions of stream water shall remain subject to the Interim Instream Flow Standards set by CWRM, and to any judgment of a court of competent jurisdiction establishing appurtenant or riparian rights in favor of downstream users (p.12)." This part of the Order was reversed by Circuit Court in October 2003 and the BLNR advised that if it does not believe it has the requisite expertise, it should wait until CWRM has acted or make its own application to establish instream flows. However, the Court Order goes on to state that the BLNR cannot "rubber-stamp" any Commission determination, meaning that at any BLNR contested case hearing, any party may challenge a Commission

driving steam turbine generators to produce electricity. HC&S also produces hydroelectric power from three run-of-river hydroelectric facilities on the Wailoa Ditch, which is supplied with water from several sources in east Maui. The hydraulic turbine generators located at the Kaheka, Paia, and Hamakua facilities on the Wailoa Ditch are capable of producing 4.5 megawatts, 1.1 megawatts, and 150 kilowatts, respectively (G. Hew, personal communication, August 2009).

Power generated from bagasse and the hydroelectric facilities is used to satisfy sugar mill power requirements first, while remaining electricity not used by the mill is sold to Maui Electric Company (MECO) for distribution, which currently amounts to approximately 7 percent of MECO's power sales. HC&S is under contract with MECO to supply, at specified rates, 12 megawatts of power from 7:00 a.m. to 9:00 p.m. daily except Sunday and 8 megawatts at all other times. According to MECO, power is sold as available, with an estimated oil savings of 44,700 barrels per year (MECO, 2008a). The contract provides for monetary penalties if these requirements are not met by HC&S. During black-outs, MECO has requested the help of HC&S to generate backup power until MECO repairs its system.

### **Water Use**

HC&S uses water from three main sources: 1) surface water from the EMI system; 2) surface water from the Wailuku Water system in west Maui that is operated jointly by HC&S and the Wailuku Water Company; and 3) ground water pumped from 16 brackish water wells located on the plantation. The EMI System was designed and constructed to take full advantage of the gravity flow of water from higher to lower elevations, thus minimizing pumping and the additional consumption of electrical power. For this reason, HC&S attempts to divert the maximum possible amount of water into the EMI system at the Wailoa Ditch level, which has a capacity of 195 million gallons per day, where the water can then be distributed by gravity flow to various fields and to HC&S' hydroelectric turbines to maximize the energy efficient use of this water (HC&S, 2009).

Currently, the HC&S sugar plantation consists of approximately 43,300 acres of land. Sugar is cultivated on roughly 35,000 acres, while the balance is leased to third parties, is not suitable for cultivation, or is used for plantation purposes (A&B, 2007). Approximately 29,000 acres are irrigated with water delivered by EMI. The total amount of water HC&S needs from EMI varies largely with weather and seasonal conditions, but ranges from a low of 134 million gallons per day in the winter months to a high of 268 million gallons per day during peak usage in the months of May to October (Findings of Fact, Conclusions of Law, and Decision and Order, 2007). From 2002 to 2004, HC&S received 71 percent of its surface water supply from EMI, while the remaining 29 percent was supplemental ground water. Of the 29,000 acres irrigated with EMI water, approximately 13,000 acres are located in elevations where irrigation with pumped water is either geographically impossible and/or economically impracticable. Since these fields are dependent on water from the EMI System, they are highly susceptible to diminished yields during drought conditions and in the summer months when ditch flows are low (HC&S, 2009).

HC&S uses drip irrigation for most of its fields. Drip irrigation is the most efficient irrigation technology available today, which is typically 90 percent efficient as compared to sprinkler system that is 75 to 85 percent efficient. In 1986, HC&S completed a 12-year project to install a drip irrigation system across the plantation. It was a 30 million dollar investment in water efficiency that would cost 90 million dollars if made today. The sugarcane fields not equipped with the drip irrigation system are irrigated with recycled mill water, which contains particulates that clog up the drip irrigation tubes. Thus, HC&S expended over 1 million dollars to install overhead sprinklers in these fields to be able to utilize the recycled mill water (HC&S, 2009).

Irrigation water is applied based on the daily needs of each field, and not the average daily water use statistic, which at most times is an inaccurate representation of the irrigation requirement for each field. The specific needs of each field are based on the crop cycle and real time measurements of rainfall and

evaporation that determine the soil moisture content of each field. To ensure the most effective and efficient use of water on the plantation, HC&S determines the irrigation requirements for each field on a day-to-day basis using a computerized water balance model. The model is essentially a water budget accounting procedure that balances the moisture input of rainfall and irrigation; the moisture output of evapotranspiration; and the change in soil-moisture storage based on the soil type in each field. A system of 15 automated weather stations is installed across the plantation that transmits hourly data used to compute daily evaporation rates using a modified Penman equation. Rainfall data is recorded daily from 41 manual gauges. Pan ratios documented in Ekern and Chang (1985) are used to estimate the amount of water required in various crop stages. Lastly, irrigation flow rates and the number of irrigation hours applied are also used to determine the water status for each field. The model then prioritizes the irrigation requirements of the fields, indicating which field(s) should receive water next (HC&S, 2009).

Although HC&S does not use the average daily water use statistic in its everyday operations, HC&S did calculate the average daily water use for its west Maui fields for the purpose of the Na Wai Eha Contested Case Hearing. The average daily water use rates for the Waihee-Hopoi fields in west Maui for 2004, 2005, and 2006 were 6,395, 7,831, and 6,254 gallons per acre per day, respectively. For comparison, HC&S also computed the average daily water use for the 29,000 acres of plantation fields irrigated with water delivered from the EMI System, which are somewhat lower because of greater seasonal variation in streamflow and HC&S' inability to supplement the 13,000 acres with pumped well water. The water use rates for these 29,000 acres ranged from a low of 4,619 gallons per acre per day in 2008 to a high of 6,858 gallons per acre per day in 2005 (HC&S, 2009).

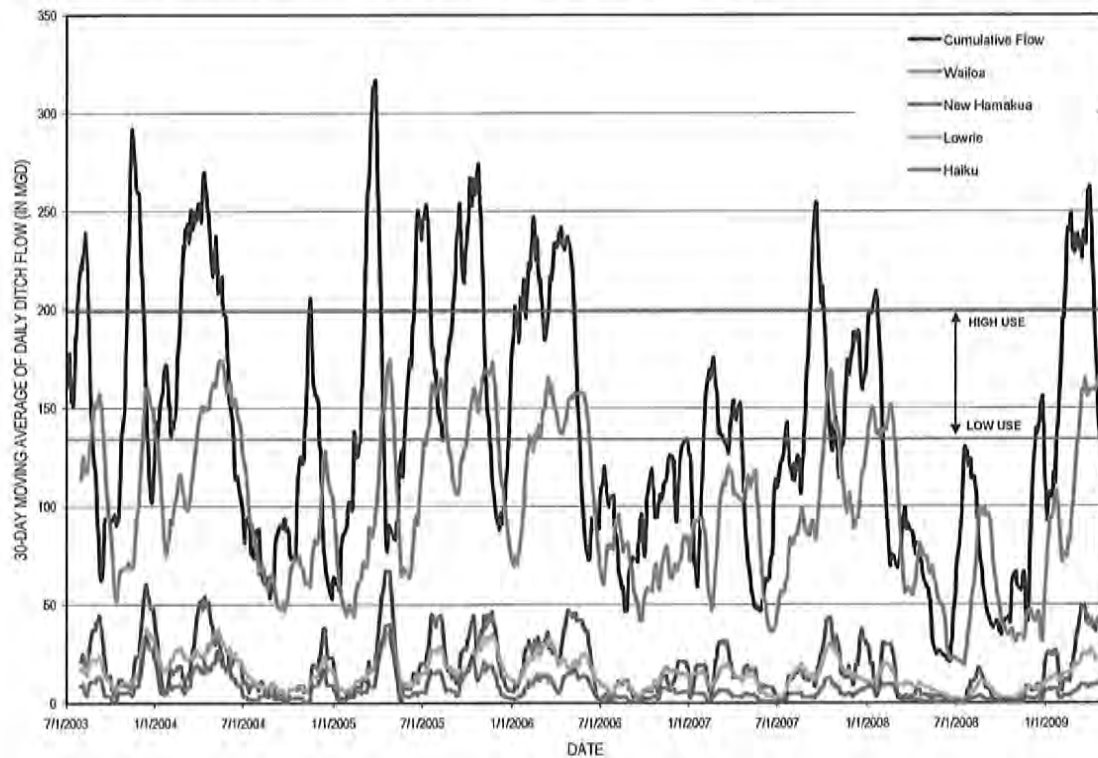
### **Economic Impact**

The availability of surface water and securing this water at reasonable cost are essential to HC&S' ability to grow sugarcane at yields that will enable the company to remain financially viable. Table 13-10 provides a summary of A&B's agribusiness revenues for 2000 to 2008. A&B's four agribusiness companies, one of which is HC&S, saw a revenue increase of 3 percent (\$4.2 million) in 2006 over the previous year, generating an operating profit of \$6.9 million. HC&S itself earned a profit margin of \$2.6 million in 2006. The increase in revenue was attributed to higher revenues in repair services and trucking, higher-power sales, higher equipment rentals and soil sales, and higher specialty sugar and molasses sales. In comparison, lower revenues were reported in the bulk sugar sales (A&B, 2007). The last two years of severe drought conditions had significant impacts on the availability of surface water and crop yields, which lead to sizable financial losses. In 2008, A&B's agribusiness sector reported a \$13 million loss, caused largely by losses at HC&S. HC&S expects its losses to be greater in 2009 as the effects of drought will have greater impact in the 2009 harvest.

**Table 13-10.** Summary of A&B's agribusiness revenues for 2000 to 2008 (Source: A&B, 2002; 2005; 2007; 2009).

Year	Revenue (dollars)	Operating Profit (dollars)	Operating Profit Margin (percent)
2008	\$ 124,300,000	\$(12,900,000)	(10.4)
2007	\$ 123,700,000	\$ 200,000	0.16
2006	\$ 127,400,000	\$ 6,900,000	5.4
2005	\$ 123,200,000	\$ 11,200,000	9.1
2004	\$ 112,800,000	\$ 4,800,000	4.3
2003	\$ 112,900,000	\$ 5,100,000	4.5
2002	\$ 112,700,000	\$ 13,800,000	12.2
2001	\$ 105,976,000	\$ 5,660,000	5.3
2000	\$ 107,510,000	\$ 7,522,000	7.0

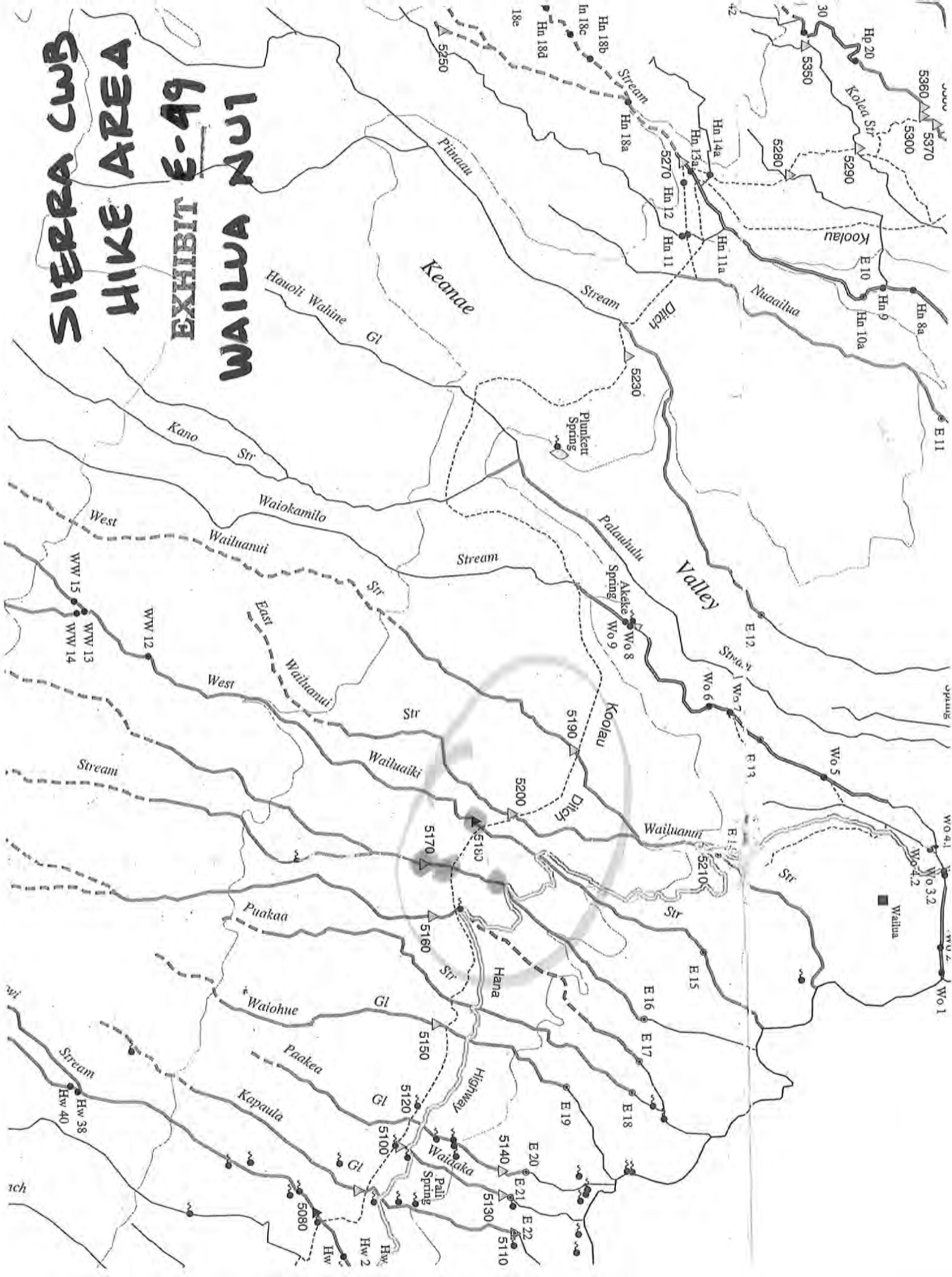
**Figure 13-10.** Individual and cumulative 30-day moving averages for Wailoa, New Hamakua, Lowrie and Haiku Ditches at Honopou, including estimated range of water use by HC&S (Source: EMI, 2009; HC&S 2009).



### **Economic Impact**

The availability of surface water and securing this water at reasonable cost are essential to HC&S' ability to grow sugarcane at yields that will enable the company to remain financially viable. Table 13-10 provides a summary of A&B's agribusiness revenues for 2000 to 2008. A&B's four agribusiness companies, one of which is HC&S, saw a revenue increase of 3 percent (\$4.2 million) in 2006 over the previous year, generating an operating profit of \$6.9 million. HC&S itself earned a profit margin of \$2.6 million in 2006. The increase in revenue was attributed to higher revenues in repair services and trucking, higher-power sales, higher equipment rentals and soil sales, and higher specialty sugar and molasses sales. In comparison, lower revenues were reported in the bulk sugar sales (A&B, 2007). The last two years of severe drought conditions had significant impacts on the availability of surface water and crop yields, which lead to sizable financial losses. In 2008, A&B's agribusiness sector reported a \$13 million loss, caused largely by losses at HC&S. HC&S expects its losses to be greater in 2009 as the effects of drought will have greater impact in the 2009 harvest.

# SIERRA CLUB HIKE AREA EXHIBIT E-49 WAILUA NUI





STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
P.O. BOX 621  
HONOLULU, HAWAII 96809

STAFF SUBMITTAL

For the meeting of the  
COMMISSION ON WATER RESOURCE MANAGEMENT

May 25, 2010  
Paia, Maui

Petitions to Amend the Interim Instream Flow Standards  
For the Surface Water Hydrologic Units of  
Waikamoi (6047), Puohokamoa (6048), Haipuaena (6049), Punalau (6050),  
Honomanu (6051), Nuaailua (6052), Ohia (6054), West Wailuaiki (6057),  
East Wailuaiki (6058), Kopiliula (6059), Waiohue (6060), Paakea (6061),  
Waiiaka (6062), Kapaula (6063), Hanawi (6064), and Makapipi (6065), Maui

PETITIONER:

Na Moku Aupuni O Koolau Hui  
c/o Native Hawaiian Legal Corp.  
1164 Bishop Street  
Honolulu, HI 96813

LOCATION MAP: See Figure 1

SUMMARY OF REQUEST:

Staff is requesting that the Commission consider the recommendations for 19 Petitions to Amend the Interim Instream Flow Standards (Interim IFS) for streams contained within the following 16 surface water hydrologic units in the region of east Maui (See Figure 1).

WAIKAMOI (6047): Waikamoi Stream, Alo Stream, and Wahinepee Stream  
PUOHOKAMOA (6048): Puohokamoa Stream  
HAIPUAENA (6049): Haipuaena Stream  
PUNALAU (6050): Punalau/Kolea Stream  
HONOMANU (6051): Honomanu Stream  
NUAAILUA (6052): Nuaailua Stream  
OHIA (6054): Ohia (Waiianu) Stream  
WEST WAILUAIKI (6057): West Wailuaiki Stream

**EXHIBIT** E-50



- Hanawi Stream: The proposed interim IFS for Hanawi Stream immediately below the EMI diversion, near an altitude of 1,300 feet, shall be established at an estimated flow of 0.1 cubic feet per second (0.06 million gallons per day). This proposed interim IFS aims to create a wetted pathway directly below the EMI diversion to provide connectivity for stream biota.
- Makapipi Stream: The proposed interim IFS for Makapipi Stream below all EMI diversions and just above Hana Highway, near an altitude of 935 feet, shall be established at an estimated flow of 0.93 cubic feet per second (0.6 million gallons per day). Due to the uncertainty of existing hydrogeologic conditions of Makapipi Stream, this interim IFS will be subject to a conditional release of water by EMI and monitoring by Commission staff. Should an estimated flow of 0.93 cubic feet per second be unattainable, the interim IFS may be revised by a future Commission action. Adjustments to ground water development tunnels will not be required.

#### **MID-TERM ACTIONS:**

The mid-term recommendations represent interim IFS that shall be implemented in a period of one (1) year after the implementation of the short-term recommendations.

- Waikamoi Stream: The proposed interim IFS for Waikamoi Stream below all EMI diversions and just above Hana Highway, near an altitude of 550 feet, shall be established at an estimated flow of 4.3 cubic feet per second (2.8 million gallons per day).
- Waiohue Stream: The proposed interim IFS for Waiohue Stream below all EMI diversions and just above Hana Highway, near an altitude of 1,195 feet, shall be established at an estimated flow of 3.2 cubic feet per second (2.1 million gallons per day).

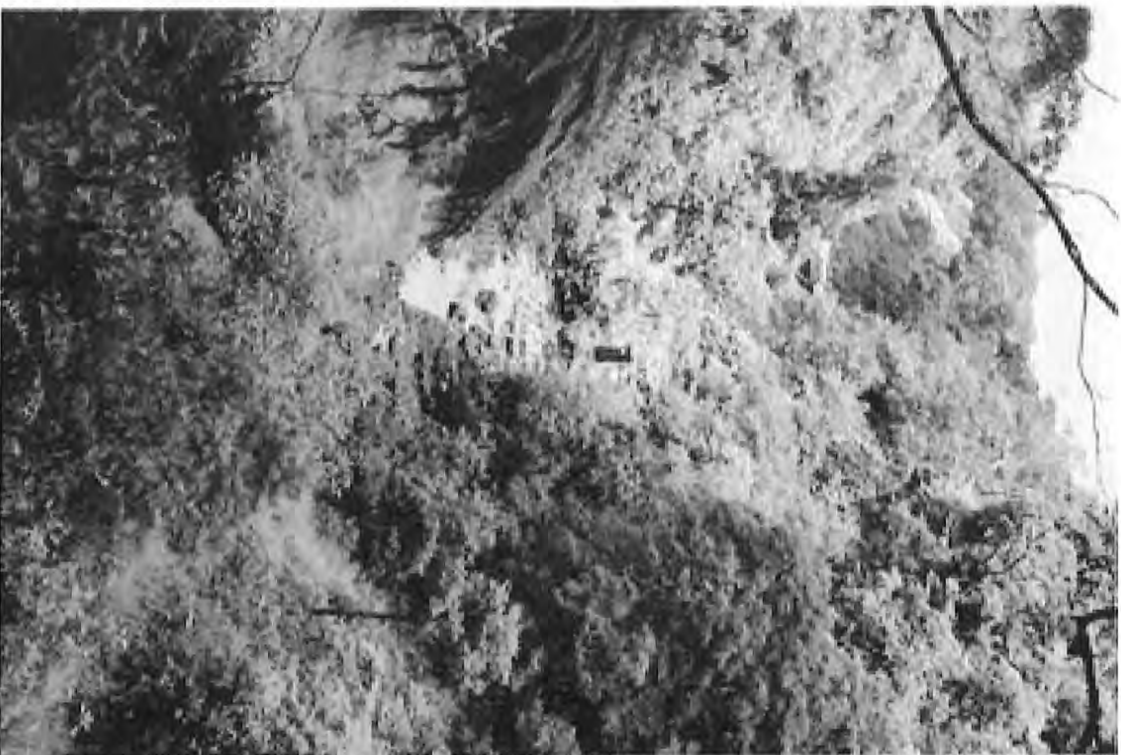
#### **LONG-TERM ACTIONS**

The long-term recommendations represent implementation actions that shall be achieved within a three (3) year time frame from the date of adoption.

- Maui DWS initiate rehabilitation and construction on the Waikamoi Flume within three (3) years. The reconstruction of the extremely leaky Waikamoi Flume is the least expensive alternative water source for Maui DWS Upcountry customers. Maui County is required to reduce waste and system loss. If action is not taken to initiate construction in this time period, then the Commission shall be obligated by law to reduce Maui DWS' diversions due to waste.

#### **MONITORING**

- HC&S currently reports monthly water use for four stations in its telemetry system. Upon approval of these recommendations, HC&S shall begin reporting water use for the other four stations in its system that are also continuously recorded (Wailoa Ditch at Opana, Kauhikoa Ditch at Maliko, Lowrie Ditch at Maliko, Haiku Ditch at Maliko). If EMI is unable to provide monthly water use reports, sufficient justification should be provided to Commission staff.
- There are currently four gaging stations in the EMI telemetry system that do not continuously record data. EMI, in coordination with Commission staff, shall identify and install continuous recorders at these four gaging stations within one year. If EMI is



**A**



**EMI diversions  
on E. Wailua iki  
leave down  
stream sections  
dry.  
April 2013**

**B**

**EXHIBIT E-51 "a" & "b"**



**C**

Fish "path" on  
 Wailua iki leads  
 to a mostly dry  
 stream bed. Water  
 levels are low  
 even above  
 diversions  
 April 2013

even above  
 diversions  
 April 2013



**D**

**EXHIBIT E-51 "C" & "D"**



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
P.O. BOX 621  
HONOLULU, HAWAII 96809

December 18, 2014

This report serves as written testimony pertaining to the work of the Commission on Water Resource Management (CWRM) in establishing, implementing, and monitoring of measurable interim instream flow standards (IIFS) for the 21 surface water hydrologic units comprising the 27 Petitions to Amend the Interim Instream Flow Standards in East Maui, filed by Native Hawaiian Legal Corporation (NHLHC) on behalf of Na Moku 'Aupuni o Ko'olau Hui (Na Moku), Beatrice Kepani Kekahuna, and Marjorie Wallet.

The approach that the CWRM staff employed in developing each respective IIFS was to first compile best available information for each surface water hydrologic unit in the form of a prepared Instream Flow Standard Assessment Report (IFSAR) (See *PR-2008-01 IFSAR 6034 Honopou*; *PR-2008-02 IFSAR 6037 Hanehoi*; *PR-2008-03 IFSAR 6053 Piinaau*; *PR-2008-04 IFSAR 6055 Waiokamilo*; *PR-2008-05 IFSAR 6056 Wailuanui*; *PR-2009-01 IFSAR 6047 Waikamoi*; *PR-2009-02 IFSAR 6048 Puohokamoa*; *PR-2009-03 IFSAR 6049 Haipuaena*; *PR-2009-04 IFSAR 6050 Punalau*; *PR-2009-05 IFSAR 6051 Honomanu*; *PR-2009-06 IFSAR 6052 Nuaailua*; *PR-2009-07 IFSAR 6054 Ohia*; *PR-2009-08 IFSAR 6057 West Wailuaiki*; *PR-2009-09 IFSAR 6058 East Wailuaiki*; *PR-2009-10 IFSAR 6059 Kopiliula*; *PR-2009-11 IFSAR 6060 Waiohue*; *PR-2009-12 IFSAR 6061 Paakea*; *PR-2009-13 IFSAR 6062 Waiaka*; *PR-2009-14 IFSAR 6063 Kapaula*; *PR-2009-15 IFSAR 6064 Hanawi*; *PR-2009-16 IFSAR 6065 Makapipi*).

Information in each IFSAR was organized into instream and noninstream uses as defined in the State Water Code, Chapter 174C-3, Hawaii Revised Statutes. The most important consideration included in each IFSAR was the hydrologic condition (surface water availability) for each hydrologic unit, which was largely based upon studies conducted by the U.S. Geological Survey.

After the preparation of each Draft IFSAR, a public comment period was conducted for review and comment to gather additional information along with Public Fact Gathering Meetings. Public comments were compiled and published in separate documents (See *PR-2008-07 Compilation of Public Review Comments*; *PR-2009-18, Compilation of Public Review Comments*; and *PR-2009-18 APPENDIX, Compilation of Public Review Comments Appendix*).

CWRM staff spent considerable time in assessing and weighing instream and noninstream uses against the hydrologic conditions for each hydrologic unit as prescribed by §174C-71, HRS. These assessments are captured in the submittals prepared for presentation to CWRM on September 24, 2008 (See *Staff Submittal C2 on Petition to Amend the Interim Instream Flow Standards for the Surface Water Hydrologic Units of Honopou (6034), Hanehoi (6037), Piinaau (6053), Waiokamilo (6055), and Wailuanui (6056), Maui*) and May 25, 2010 (See *Staff Submittal C1 on Petitions to Amend the Interim Instream Flow Standards For the Surface Water Hydrologic Units of Waikamoi (6047), Puohokamoa (6048), Haipuaena (6049), Punalau (6050), Honomanu (6051), Nuaailua (6052), Ohia (6054), West Wailuaiki (6057), East Wailuaiki (6058), Kopiliula (6059), Waiohue (6060), Paakea (6061), Waiaka (6062), Kapaula (6063), Hanawi (6064), and Makapipi (6065), Maui*).

The primary difference between the September 24, 2008 and May 25, 2010 Staff Submittals was the submission of additional information to CWRM. CWRM staff initially prepared a Staff Submittal for a December 16, 2009 meeting. Prior to the December meeting, information was submitted by multiple parties including the Department of Agriculture (HDOA), Maui Department of Water Supply (MDWS), Maui Office of Economic Development, Maui County Farm Bureau, Hawaiian Commercial & Sugar Company (HC&S) (See *PR-2009-17, Compilation of Data Submissions*), Bishop Museum and the Hawaii Division of Aquatic Resources (DAR) (See *Hawaiian Stream Habitat Evaluation Procedure for East Maui Streams Report*). Following two days of presentations and testimony at its December meeting, CWRM deferred action and directed certain parties to provide specific information to CWRM staff for further consideration. Additional information was submitted by DAR, HC&S, MDWS, Maui Land & Pineapple Company, Inc., and NHLC (See *PR-2010-01, Compilation of Data Submissions, Part II*).

The majority of this report provides a summary of the adaptive management strategies that were proposed by CWRM staff and approved by CWRM in the September 2008 and May 2010 decisions. CWRM staff did its best to follow through with implementation, monitoring, and evaluation strategies given the limited staffing experienced as a result of the economic challenges from 2010 to 2013. The actions summarized here are organized by hydrologic unit and provide references to specific files that include CWRM Gage Data, CWRM Submittals, CWRM Updates, Field Investigation Itineraries, Field Investigation Reports, and USGS Information. These files will be made available to the Hearings Officer and all parties via email and/or CWRM's website.

This report was prepared by Dean Uyeno, Hydrologic Program Manager for CWRM's Stream Protection and Management Branch. Should you have any questions, please contact Dean Uyeno by phone at (808) 587-0249 or by email at [dean.d.uyeno@hawaii.gov](mailto:dean.d.uyeno@hawaii.gov).

NOTE: All of the references listed above are available for download from the CWRM website at <http://dlnr.hawaii.gov/cwrmsurfacewater/ifs/eastmauiifs1/>

## Summary of Maui Interim Instream Flow Standards

	Interim IFS Amounts				Restoration Amounts				Altitude feet	Notes on Interim IFS Location
	Wet Season		Dry Season		Wet Season		Dry Season			
	cfs	mgd	cfs	mgd	cfs	mgd	cfs	mgd		
<b>EAST MAUI INTERIM IFS LOCATIONS (Stream listed from West to East)</b>										
Honopou – Site A	2.00	1.29	(Annual)	(Annual)	1.49	0.96	(Annual)	(Annual)	383	Lower reach of Honopou Stream, downstream of Haiku Ditch.
Honopou – Site B	0.72	0.47	(Annual)	(Annual)	Unknown		(Annual)	(Annual)	40	Lower reach of Honopou Stream near 40 feet elevation.
Huelo (Puoluia)	0.89	0.57	(Annual)	(Annual)	Unknown		(Annual)	(Annual)	420	Lower reach of Huelo (Puoluia) Stream near 420 ft. elevation, downstream of Haiku Ditch
Hanehohi – Site B	0.63	0.41	(Annual)	(Annual)	Unknown		(Annual)	(Annual)	420	Lower reach of Hanehohi Stream, downstream of Haiku Ditch.
Hanehohi – Site C	1.15	0.74	(Annual)	(Annual)	Unknown		(Annual)	(Annual)	690	Lower reach of Hanehohi Stream, upstream of Lowrie Ditch and diversion of water for Huelo community.
Waikamoi	2.80	1.81	0	0	2.60	1.68	0	0	550	Just above Hana Highway.
Alo	–	–	–	–	–	–	–	–	–	One measurable interim IFS established for Waikamoi Stream below the confluence with Alo Stream.
Waihepee	0.50	0.32	(Annual)	(Annual)	–	–	–	–	575	Just above Hana Highway, as designated on October 8, 1988.
Puohokamoa	0.40	0.26	(Annual)	(Annual)	–	–	–	–	565	Just above Hana Highway, as designated on October 8, 1988.
Haipuaena	0.10	0.06	(Annual)	(Annual)	–	–	–	–	510	Just above Hana Highway, as designated on October 8, 1988.
Punalau/Kolea	0.20	0.13	(Annual)	(Annual)	–	–	–	–	40	Just above Hana Highway, as designated on October 8, 1988.
Honomanu	0	0	(Annual)	(Annual)	–	–	–	–	20	Just above Hana Highway, as designated on October 8, 1988.
Nuaailua	3.10	2.00	(Annual)	(Annual)	–	–	–	–	110	Just above Hana Highway, as designated on October 8, 1988.
Piinaau	Status quo	–	–	–	–	–	–	–	–	Just above Hana Highway.
Palauhulu	5.50	3.56	(Annual)	(Annual)	0.70	0.45	(Annual)	(Annual)	80	Lower reach of Palauhulu Stream, upstream from the confluence of Piinaau and Palauhulu Streams.
Ohia (Waianu)	4.60	2.97	(Annual)	(Annual)	–	–	–	–	195	Just above Hana Highway, as designated on October 8, 1988.
Waiokamilo	4.9	3.17	(Annual)	(Annual)	–	–	(Annual)	(Annual)	420	Lower reach of Waiokamilo Stream, downstream of Koolau Ditch, but upstream of the confluence of Waiokamilo and Kualani Streams.
Kualani	Status quo	–	–	–	–	–	–	–	–	Kualani (Hamaui) Stream, tributary of Waiokamilo Stream.
Wailuanui	3.05	1.97	(Annual)	(Annual)	2.05	1.33	(Annual)	(Annual)	620	Lower reach of Wailuanui Stream, downstream of Koolau Ditch, below the confluence of East and West Wailuanui Streams.
West Wailuaiki	3.80	2.46	0.40	0.26	3.80	2.46	0.40	0.26	1,235	Just above Hana Highway.
East Wailuaiki	3.70	2.39	0.20	0.13	3.70	2.39	0.20	0.13	1,235	Just above Hana Highway.
Kopiliua	0.50	0.32	(Annual)	(Annual)	–	–	–	–	1,270	Just above Hana Highway, as designated on October 8, 1988.
Puakaa	0.60	0.39	(Annual)	(Annual)	–	–	–	–	1,235	Just above Hana Highway, as designated on October 8, 1988.
Waiohue	3.20	2.07	0.10	0.06	3.2	2.07	0.10	0.06	1,195	Just above Hana Highway.
Paakea	1.50	0.97	(Annual)	(Annual)	–	–	–	–	1,265	Just above Hana Highway, as designated on October 8, 1988.
Waiiaka	0	0	(Annual)	(Annual)	–	–	–	–	1,235	At Hana Highway, as designated on October 8, 1988.
Kapaula	0.20	0.13	(Annual)	(Annual)	–	–	–	–	1,194	Just above Hana Highway, as designated on October 8, 1988.
Hanawi	0.10	0.06	(Annual)	(Annual)	0.10	0.06	(Annual)	(Annual)	1,315	Below EMF's main Hanawi diversion (Inlake K-3).
Makapii	0.93	0.60	(Annual)	(Annual)	0.93	0.60	(Annual)	(Annual)	935	Just above Hana Highway.

# Damselflies: flying earwig Hawaiian damselfly (*Megalagrion nesiotae*)

ID number: Zygotera. Cornigruendae!

Profile prepared by Celeste Mazzacano. The Xerces Society for Invertebrate Conservation

*Megalagrion nesiotae* was found historically on the islands of Hawaii and Maui, but is currently known only from a single population on East Maui. Its limited habitat and small population size may affect long-term stability. The species is susceptible to the effects of habitat loss and introduced species. Research should focus on the life history of the species and habitat management and protection.

read full profile

- conservation status
- description and taxonomic status
- life history
- distribution

This species was originally known from the islands of Hawaii (Kau, Kilauea, Olaa, and Kona) and windward eastern Maui (Halipuaena, Honomaniu, Kailua, and Keanae). The Maui populations were thought to have been extirpated, but intensive surveys resulted in finding a single population of *M. nesiotae* on east Maui in 2002. This population was found along east Waiauaki Stream, upslope of a busy highway, in what was considered sub-optimal habitat for the species. Additional colonies could be present at intermediate elevations, but these may have escaped detection because the topography of the area makes sampling difficult, as does the tendency of adults to fly low into tangled undergrowth when disturbed. *M. nesiotae* is thought to have been extirpated on Hawaii (USFWS, 2007).



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## Dragonflies & Damselflies

- Dragonflies
- boral wetlands
- discrete terraces
- Pacific clutches
- wetland-based ringtail
- Whitlough's emergence

EXHIBIT E-53



Photo: David Preston; *Megalagrion pacificum*

## Terrestrial Invertebrates

### Damselflies and Dragonflies Order Odonata

#### ORDER INCLUDES:

- 3 Native Families
- 4 Native Genera
- 33 Native Species
- 31 Endemic Species

**GENERAL INFORMATION:** Dragonflies are an ancient insect group that coexisted with dinosaurs, and are part of an easily recognized and well-known insect order (Odonata). All members of the order are predaceous, have large compound eyes, two pairs of large membranous wings, and a long, thin abdomen. No dragonfly or damselfly stings and all have an aquatic larval form (i.e., nymph). The order consists of two suborders, one contains the damselflies and the other the dragonflies. Damselflies are weak fliers, and at rest most hold their wings close to the body. Dragonflies are strong fliers, and at rest hold their wings away from the body. Because of the diversity and extensive adaptive radiation, the native damselfly genus *Megalagrion* is particularly well-studied. Many *Megalagrion* species are endemic to single islands or ridges, and at least ten of the 23 species in the genus are considered at risk. *M. oahuenses* is one of the few truly terrestrial damselflies in the world. Also notable is the endemic dragonfly, *Anax strenuous*. It is the largest Hawaiian native insect with a wingspan of 15 centimeters (6 inches).

**DISTRIBUTION:** Dragonflies and damselflies are known from all the MHI except for Kaho'olawe.

**ABUNDANCE:** Unknown. A lack of systematic surveys prevents any population estimate. However, the loss of native habitats likely means that species within the order are declining.

**LOCATION AND CONDITION OF KEY HABITAT:** Larvae and adult odonates occur in or near a wide range of aquatic habitats (e.g., streams, plunge pools, reservoirs, anchialine pools, lowland swamps and marshes), montane forests and bogs, and lowland habitats, many of which are threatened by habitat change and loss. The following areas are key habitats for four species of *Megalagrion*, all of which are candidates for federal listing: East Wailua Iki Stream on Maui (*M. nesiotes*), Tripler Army Medical Center on O'ahu (*M. xanthomelas*), Waiawa, North Hālawā, Kahana and Ma'akua Streams on O'ahu (*M. leptodemas*), and headwaters and upper mid-reaches of all drainages in the windward Ko'olau Mountains from Kaluanui to Kahawainui (*M. oceanicum*).

**THREATS:**



- Loss or degradation of habitat such as from water diversions or disturbance caused by feral ungulates.
- Non-native invasive invertebrates, fish and frogs prey on nymphs.

**CONSERVATION ACTIONS:** The goals of conservation actions are not only to protect current populations and key breeding habitats, but also to establish additional populations, thereby reducing the risk of extinction. In addition to common statewide and island conservation actions, specific management directed toward dragonflies and damselflies should include:

- Identify and protect streams currently free of non-native species and human alterations, particularly in lowland areas.
- Conduct surveys to determine distribution and abundance of known dragonfly and damselfly populations and to document and identify new species.
- Enhanced protection of key watersheds.
- Support captive breeding and relocation/translocation of *Megalagrion xanthomelas* on O'ahu.
- Preserve, maintain, and restore habitats supporting existing populations.

**MONITORING:**

- Continue monitoring of known populations to assess population trends.
- Survey for additional, new populations.
- Conduct surveys for species believed to be extinct.

**RESEARCH PRIORITIES:**

- Conduct studies to determine the cause(s) of decline of stream-breeding species, particularly on O'ahu.
- Assess potential haplotype differences among island populations of widespread species to determine the importance of protecting populations on individual islands.

**References:**

Howarth FG, Mull WP. 1992. Hawaiian insects and their Kin. Honolulu: University of Hawai'i Press.

Kondratieff BC, (coordinator). 2000. Dragonflies and Damselflies (Odonata) of the United States. Jamestown, (ND): Northern Prairie Wildlife Research Center Online. Available at: <http://www.npwrc.usgs.gov/resource/distr/insects/dfly/dflyusa.htm> (Version 12DEC2003).

Nishida GM editor. 2002. Hawaiian terrestrial arthropod checklist, 4<sup>th</sup> edition. Honolulu (HI): Biological Survey, Bishop Museum.

Polhemus DA. Smithsonian Institution. Personal communication.

Polhemus DA. "Damsels in distress: a review of the conservation status of Hawaiian Megalagrion damselflies." Available at: <http://www.bishopmuseum.org/research/natsci/ento/Megalagrion/htmlPages/Mega01.shtml> (accessed 12 February 2004).

Polhemus DA. 2004. Critical species of Odonata in the Hawaiian Islands. International Journal of Odonatology 7(2):133-138.

Polhemus DA, Asquith A. 1996. Hawaiian damselflies: a field identification guide. Honolulu, (HI): Bishop Museum Press.

Zimmerman EC. 2001. Insects of Hawaii: Volume 1 Introduction. Honolulu: University of Hawai'i Press.

East Maui Stream Flow Ranks

Stream	Habitat Units (HU in m)	# of Diversions	cfs at H90	cfs at H100	Terminal Falls	HU	Poorest Condition - Species	POD - Effort to fix	Rankings			Watershed Atlas Rating		
									Efficient Water Use	Average	FINAL RANK	Geography	TWR	TBR
Puohokamoa	9,743	3	5.12	8.9	No	1	1	5	2.25	1	w	8	5	7
Waikamoi	7,013	5	4.18	6.6	Yes	2	6	8	4.75	6	w	7	7	8
Haipuaena	5,173	3	2.53	4.4	Yes	3	3	7	3.5	3	w	8	5	6
Kopiliula	5,138	2	3.12	6	No	4	5	5	4.25	5	e	8	7	8
E. Waialua Iki	4,375	1	3.23	5.75	No	5	2	1	3.25	2	e	7	7	8
W. Waialua Iki	4,019	1	3.48	6	No	6	4	1	4.25	4	e	7	7	8
Hanawi	3,456	1	0	0	No	7	8	1	6	4	e	7	7	8
Waiohue	2,718	1	2.77	5.2	No	8	7	1	8 (n/a)	8	e	8	8	9
Total	41,635	17	24	43					5.75	7	e	7	8	8

Stream	Habitat Units (HU in m)	# of Diversions	cfs at H90	cfs at H100	Terminal Falls	HU	Poorest Condition - Species	POD - Effort to fix	Rankings			Watershed Atlas Rating		
									Efficient Water Use	Average	FINAL RANK	Geography	TWR	TBR
Puohokamoa	9,743	3	5.12	8.9	No	1	1	5	2.25	1	w	8	5	7
E. Waialua Iki	4,375	1	2.53	5.75	No	5	2	1	3.25	2	e	7	7	8
Haipuaena	5,173	3	3.48	4.4	Yes	3	3	7	3.5	3	w	8	5	6
W. Waialua Iki	4,019	1	3.12	6	No	4	4	1	4.25	4	e	7	7	8
Waikamoi	5,138	2	4.18	6.6	No	6	5	5	4.25	5	e	8	7	8
Waiohue	2,718	1	2.77	5.2	No	8	7	1	6	4	w	7	7	8
Hanawi	3,456	1	0	0	No	7	8	1	8 (n/a)	8	e	7	8	9
Total	41,635	17	24	43					6	8	e	8	8	9

Habitat Units reflect the total amount of habitat for the native species of cophoc currently lost to flow diversion or barriers # of diversion is based on the surveys by DARR and CWRM

H90 and H100 are the percent of habitat based on the USGS IFIM study for East Maui Streams

Terminal Falls are waterfalls at the mouth of a stream that restrict upstream movement of non-climbing species

In the ranking sections:

Habitat Units are the ranked order from column 1

Poorest Condition - Species ranks stream that are in the worst condition first and lack some native species

POD - Effort to fix the Point of Diversion (POD) and an estimate of the difficulty of providing fish passage

Efficient water use was the ranking of HU/cfs at H90. More habitat per cfs scored better. Hanawi does not require water return thus we ranked it 8 (n/a).

Average was the average of the first four ranking columns

FINAL RANK was the ranking of the average with West Waialua Iki ranked ahead of Kopiliula due to its easier diversion fix.

Geography show in which section of the area the streams were located in. We wanted to spread out the stream restoration if possible.

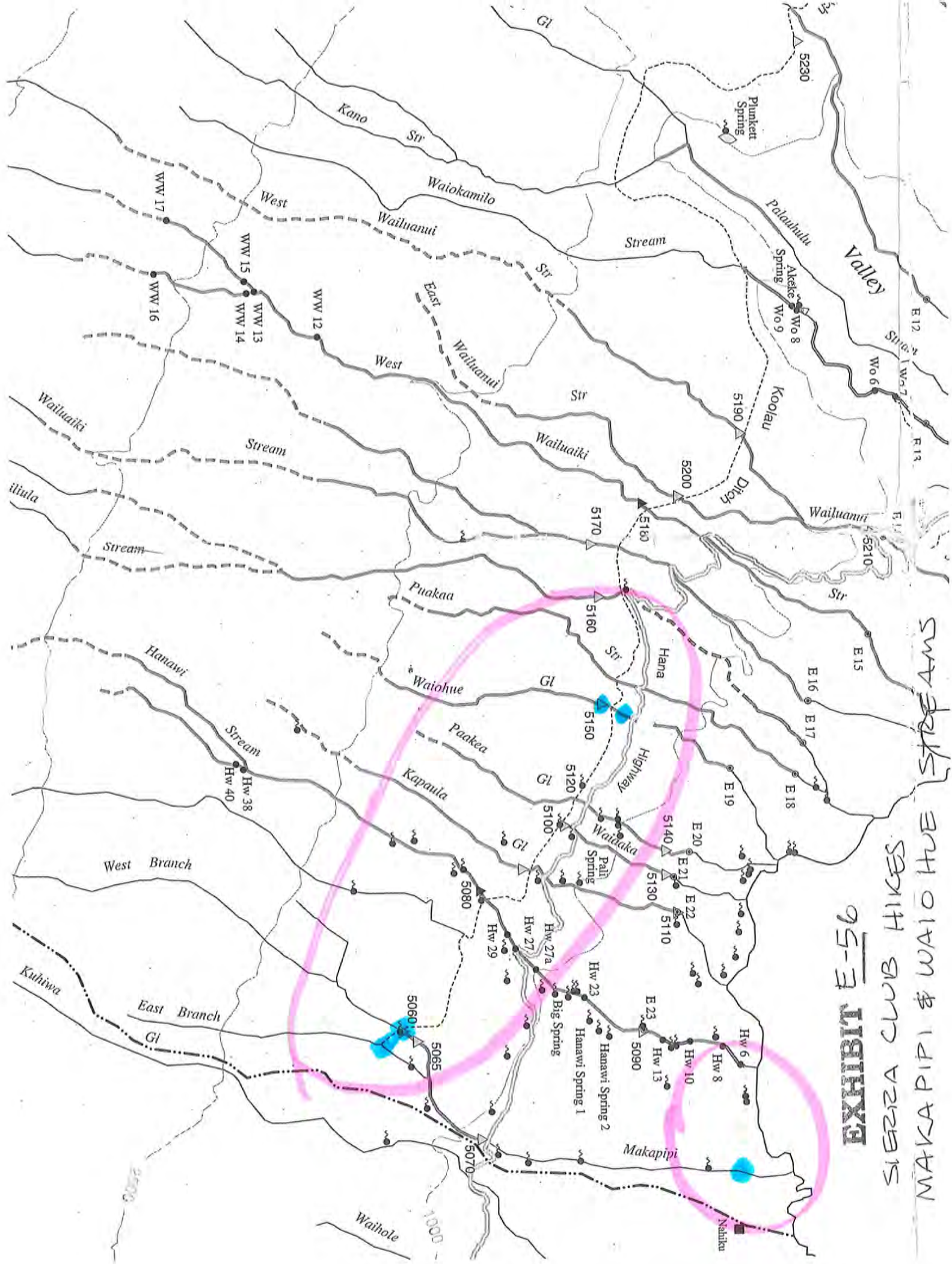
Watershed Atlas ratings are shown in the last three columns

TWR = Total watershed rating

TBR = Total biological rating

COR = Combined overall rating

\*Current spread sheet doesn't consider seasonality or connectivity issues



**EXHIBIT E-56**

SEVERAL CLUB HIKES  
 MAKAPIPI & WAIUANI STREAMS

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**Instream Flow Standard Assessment Report**  
**Island of Maui**  
**Hydrologic Unit 6060**  
**Waiohue**

December 2009

PR-2009-11

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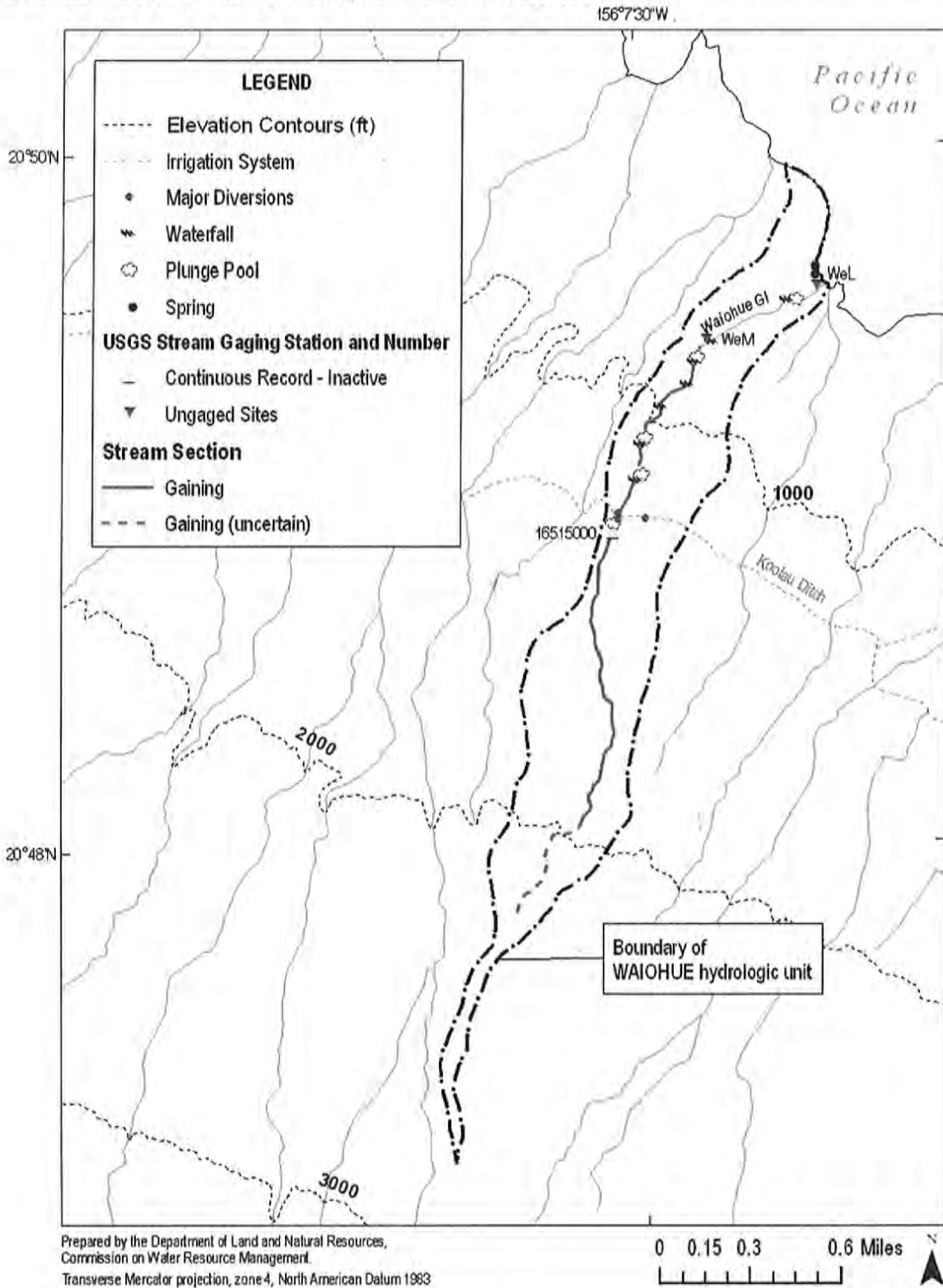
**State of Hawaii**  
Department of Land and Natural Resources  
Commission on Water Resource Management



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**EXHIBIT** E-57

Figure 3-3. Location of diversions, irrigation systems, USGS gaging stations, and selected ungaged sites in Waiohue hydrologic unit (Source: State of Hawaii, Office of Planning, n.d.; 1996, 2004c; 2005; USGS, 2001b).



**Table 4-2.** Hawaii Stream Assessment categorization of aquatic resources in Waiohue Stream.

Category	Value	Rank
Native Species Group 1 (NG1) Four native freshwater species were classified as “indicator species” and comprised the Native Species Group One (NG1). The committee considered these species, ‘o‘opu alamo‘o ( <i>Lentipes concolor</i> ), ‘o‘opu nakea ( <i>Awaous stamineus</i> ), ‘o‘opu nopili ( <i>Sicyopterus stimpsoni</i> ), and hihiwai ( <i>Neritina granosa</i> ), as representatives of potentially high quality stream ecosystems.	4	Excellent
Native Species Group 1 (NG2) The other seven native species considered more common comprised Native Species Group Two (NG2). These included two ‘o‘opu akupa ( <i>Eleotris sandvicensis</i> ), ‘o‘opu naniha ( <i>Stenogobius genivittatus</i> ), aholehole ( <i>Kuhlia sandvicensis</i> ), ‘ama‘ama ( <i>Mugil cephalus</i> ), ‘o‘pae kala‘ole ( <i>Atyoida bisulcata</i> ), ‘o‘pae ‘oeha‘a ( <i>Macrobrachium grandimanus</i> ), and hapawai ( <i>Theodoxus vespertinus</i> ). Presence of these species was considered to be typical of a healthy native stream ecosystem.	7	Excellent
Introduced Species Group One (IG1) This group included noxious, non-native stream animals that may prey upon and/or out-compete with native species. <i>Macrobrachium lar</i> . (Tahitian prawn), was not included in this group even though it may pose a threat to native stream animals because it is believed to be present in almost all Hawaiian streams.	1	
Introduced Species Group Two (IG2) This consists of the non-native species considered to be innocuous to Hawaiian streams.	0	

### 4.3 Analysis of Habitat Availability

In cooperation with the Commission on Water Resource Management and others, the USGS conducted a study to assess the effects of surface water diversion systems on habitat availability for native stream species in northeast Maui. The goal was to determine a relationship between streamflow and habitat availability using a habitat selection model. Five out of 21 streams in the study area were selected for intensive study because they represented a range of hydrologic conditions (i.e., geographic location, drainage area, terminal waterfall, estuary, human impacts, data availability, and access) present in the study area. By incorporating hydrology, stream morphology, and habitat characteristics, the model simulated habitat and streamflow relations for various species and life stages (Gingerich, 2005) in the 5 representative streams. Results of this habitat model, along with additional data from field reconnaissance surveys, aerial images, and GIS analyses, were extrapolated to estimate habitat availability in the remaining 16 streams. The outcome of the study was ultimately a map (Gingerich and Wolff, 2005, Plate 1) describing the habitat availability for native stream fauna in 21 streams in northeast Maui.

The study focused on certain native fish, snail and shrimp species found in Hawaiian streams. Three fish species of the Gobiidae family, also known as gobies, were considered: 1) alamo‘o (*Lentipes concolor* (Gill)); 2) nopili (*Sicyopterus stimpsoni* (Gill)); and 3) nakea (*Awaous guamensis* (Valenciennes)). The gobies of interest have a fused pelvic fin, allowing them to climb upstream. One of the fresh water snail species, *Neritina granosa* (Sowerby), commonly referred to as hihiwai, and the mountain shrimp, *Atyoida bisulcata* (Randall), also known as opae kalaole or mountain opae, were also considered in the study. Since opae and alamo‘o (adult and juvenile) do not typically live in the lower reaches, they were evaluated only in the middle and upper sites. The lower sites were evaluated for adult and juvenile nopili, adult nakea, and hihiwai.

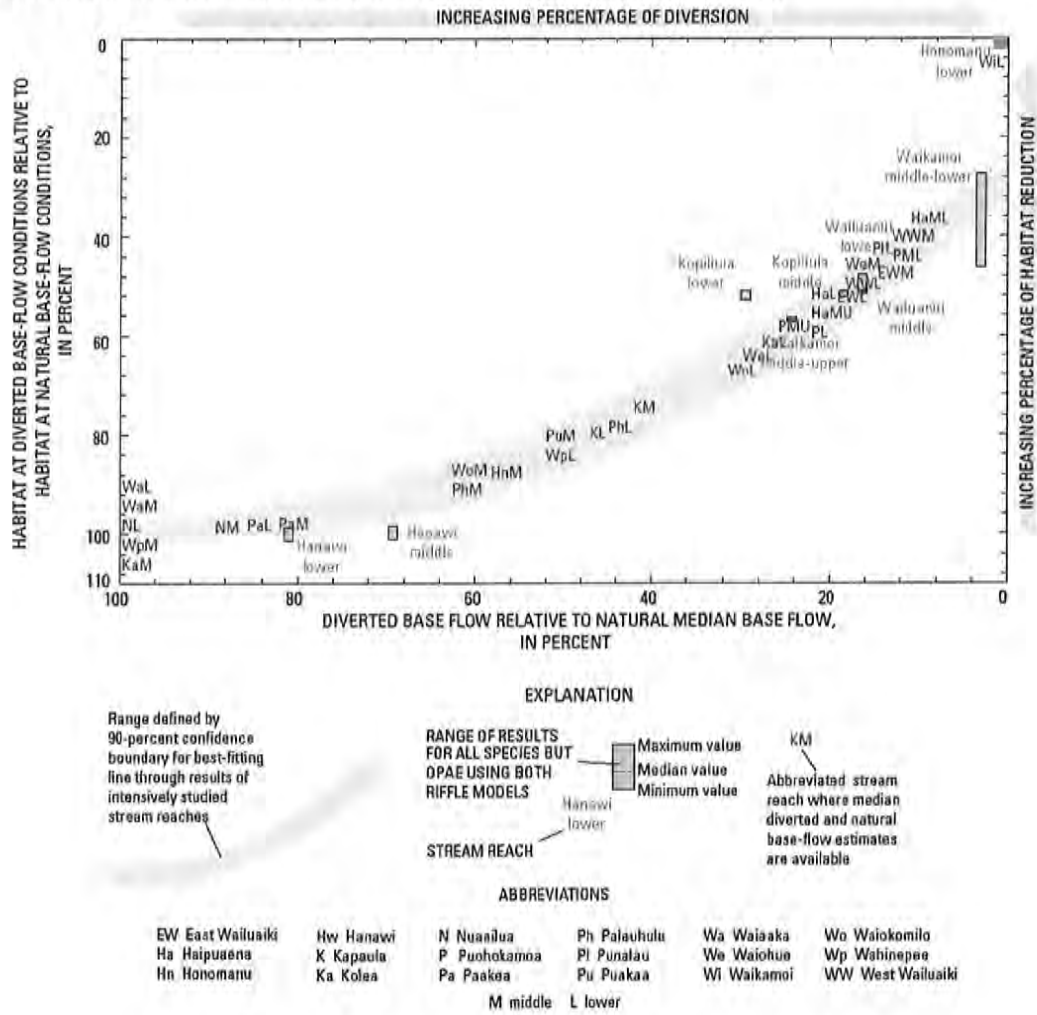
Since Waiohue was not one of the intensely studied streams used to develop the streamflow-habitat relationship, results of the habitat simulation model were extrapolated to estimate the stream habitat availability. Estimated natural and diverted median total and base flows were compiled from Gingerich (2005). Since streamflow measured during the habitat surveys was lower than estimated median total and

base flow under diverted conditions, it can be assumed that habitat measurements were made during the driest conditions. Results of the habitat simulation model can be summarized in Figure 4-2. The plot shows the relationship between diverted base flow (x-axis) and habitat availability (y-axis). The colored band indicates the range of values as defined by the 90 percent confidence level. If results from a particular site lie within this colored band, then there is only a 10 percent chance that the results will not be as predicted by the plot. In general, the plot shows that as base flow increases, the area of estimated usable streambed habitat for all interested species also increases. It also shows that "the addition of even a small amount of water to a relatively dry stream can have a significant effect on the amount of habitat available." For instance, when 20 percent of the natural base flow is returned to a dry reach, natural habitat availability increases to 60 percent. Estimates of expected habitat availability are representative for opae and alamoos upstream of large waterfalls.

Of the 70 miles of stream length within the study area, 36 miles have retained 75 to 100 percent of the natural habitat availability, 8 miles with 25 to 50 percent of the natural habitat, and 11 miles with no habitat at all because the stream reaches were dry (Table 4-3). Of the 36 miles with more than 75 percent natural habitat, 20 miles of the stream length were upstream from major diversion ditches. Figure 4-3 describes the habitat availability for Waiohue Stream and specific data are included in Table 4-4. Upstream of Koolau Ditch where there are no diversions, the stream has no reduction in flow and thus, retains 100 percent of the natural habitat. Downstream from the ditch, the stream is dry (no available habitat) until more ground water is gained to provide 45 to 55 percent of the expected natural habitat for all species except opae, and at least 63 percent of natural opae habitat under diverted conditions (17 percent of natural flow conditions). Near the coast, the stream retains enough water to provide at least 67 percent of the expected habitat availability, and over 70 percent of the natural opae habitat under diverted conditions. Overall, less than 50 percent of the natural habitat for all species in Waiohue Stream was maintained below Koolau Ditch under diverted conditions.



**Figure 4-2.** Relative habitat available for given relative base flow at studied streams. Relative change is the difference between natural and diverted conditions divided by natural conditions (Gingerich and Wolff, 2005).



**Table 4-3.** Summary of estimated aquatic habitat distribution at diverted base flow relative to natural conditions, calculated using GIS from Gingerich and Wolff (2005).

Habitat Availability	Stream Length (miles)
100 percent (no reduction)	26
75 to 100 percent	10
50 to 100 percent	10
25 to 50 percent	8
0 percent (dry)	11
Insufficient Information	5
<b>Total *</b>	<b>70</b>

\* The total linear miles of stream length differs from that presented in Ford et al. (2009) probably due to differences in digitization of the stream reaches from Gingerich and Wolff (2005), Plate 1.

**Table 4-4.** Summary of relative base flow and available habitat in Waiohue Stream (Source: Gingerich and Wolff, 2005, Table 10).

*[ft<sup>3</sup>/s is cubic foot per second; Numbers in **bold italic** are considered maximums at sites downstream of unquantified but known losing reaches]*

Stream site	Median base flow remaining in stream (ft <sup>3</sup> /s)		Median base flow at diverted conditions relative to median base flow at natural conditions (% of natural conditions)	Habitat available at diverted conditions (excluding opae) relative to habitat available at natural conditions (% of natural conditions)	Habitat available for opae at diverted conditions relative to habitat available at natural conditions (% of natural conditions)
	Diverted	Natural			
lower (WeL)	2.1	<b>7.5</b>	28	68 – 57	76 – 71
middle (WeM)	1.0	6.0	17	55 – 45	67 – 63

#### 4.4 Distribution of Native Freshwater Species

The HSA inventory was general in nature, resulting in major data gaps, especially those related to the distribution and abundance of aquatic organisms – native and introduced – inhabiting the streams. The State of Hawaii Division of Aquatic Resources (DAR) has since continued to expand the knowledge of aquatic biota in Hawaiian streams. Products from their efforts include the compilation and publication of an *Atlas of Hawaiian Watersheds and Their Aquatic Resources* for each of five major islands in the state (Kauai, Hawaii, Oahu, Molokai, and Maui). Each atlas describes watershed and stream features, distribution and abundance of stream animals and insect species, and stream habitat use and availability. Based on these data, a watershed and biological rating is assigned to each stream to allow comparison with other streams on the same island and across the state. The data presented in the atlases are collected from various sources, and much of the stream biota data are from stream surveys conducted by DAR. Figure 4-4 illustrates the DAR survey locations on Waiohue Stream. Currently, efforts have been focused on updating the atlases with more recent stream survey data collected statewide, and developing up-to-date reports for Commission use in determining the interim IFS recommendations for east Maui. The following is a brief summary of findings for Waiohue Stream.

- **Point Quadrat Survey.** A number of native stream animals were observed in Waiohue Stream, including oopu nakea (*Awaous guamensis*), oopu nopili (*Sicyopterus stimpsoni*), oopu akupa (*Eleotris sandwicensis*), opae kalaole (*Atyoida bisulcata*), and hihiwai (*Neritina granosa*). During the most recent surveys, oopu nopili was observed near the stream mouth at a water temperature of 20.5 degree Celsius. Oopu nakea and hihiwai were observed in the upper reach near the ditch. The only species recorded in the upper reach above the ditch was opae kalaole. Water temperatures dropped by almost 3 degrees from the lower reach to the upper reach above the ditch. Introduced species such as river prawns (*Macrobrachium lar*) and guppies (*Poecilia reticulata*) were also observed in the stream. The poeciliid fishes dwell in the deep pools created above diversion structures and are known to transmit parasites to native fishes.
- **Estuary Survey.** A recent cast net sampling of the stream mouth and shoreline at Waiohue resulted in catches of aholehole (*Kuhlia xenura*) and Kupipi (*Abudefduf sordidus*). The most dominant catch was aholehole (*Kuhlia xenura*), which were found in areas with varying salinity. The stream had minimal flow entering the ocean during the survey.
- **Insect Survey.** Native damselfly species were observed in the lower and upper reaches of Waiohue Stream; however, the DAR report did not specify which species of damselfly was observed.
- **Watershed and Biological Rating.** Waiohue watershed rates above average (score of 7 out of 10) for Maui and statewide. A combination of forested lands and high rainfall amounts contribute

to the rating of this watershed. The stream also rates fairly well (score of 8 out of 10) on biota due to the high diversity of native species observed in the stream.

Despite the limited available habitat downstream of the ditch, West Wailuaiki Stream had a fairly good diversity of native stream animals. The upper reach above the ditch had moderate streamflow and water temperatures almost 3 degrees cooler than the lower reach, suggesting dewaterment of the stream by the ditch. Based on data collected by DAR, the abundance of aholehole in the estuary could be an indicator for a healthy stream since this species of fish was commonly found in estuaries with flowing streams and open stream mouths to the ocean. Waiohue Stream has the potential to sustain larger populations of native species than currently observed if flow is restored to the downstream reach to increase stream connectivity and available instream habitat. Due to the small size of the estuary, flow restoration would not result in substantial increases in estuarine habitats.

The SWCA Environmental Consultants, at the request of Hawaiian Commercial and Sugar Company, conducted a literature review of the existing data collected by DAR, USGS, and other investigators (Ford et. al., 2009). The objective of this document was to present biological information that may help the Commission in determining reasonable and beneficial instream and offstream uses of the surface water in east Maui. The authors stressed that no data exists to suggest "any of the nine native Hawaiian amphidromous species is at risk of either endangerment and/or extinction in east maui streams or else where in the State", and that dry reaches in diverted streams are periodically wetted by freshets, allowing streamflow continuity and the upstream migration of native species. On the other hand, there is no proof that continued habitat degradation in some of the streams due to dewaterment will not affect species survival (PR-2009-18, 85.0). Other investigators have reported that "hihiwai were limited to about 185 meters and 223 meters in the lower reaches of Waiohue and Waikolu Streams [Maui], respectively...and suggested this was due to the effect of dewaterment on habitat availability" (as cited in Ford et. al., 2009). It was also important to note that frequent changes in stream community structure, such as a change in the streambed composition due to a high flow event, that may result in absence of native stream animals should not be interpreted as a negative indicator of stream health.

The consultant summarized data mainly from the USGS habitat availability study (Gingerich and Wolff, 2005) and DAR's Atlas of Hawaiian Watersheds and Their Aquatic Resources (Tables 4-5 and 4-6). Please note that Commission staff is awaiting updated data from DAR and will supplement the following tables with new data. Compared with the other east Maui streams, a diversity of stream animals were observed in Waiohue Stream. All of the native amphidromous species were observed throughout the stream channel. However, extensive surveys conducted by the USGS revealed no alamoo above the diversions, and results from DAR surveys do not specifically indicate aquatic species observed above the diversions. One alien amphidromous species, the Tahitian prawn was also present in the stream. According to Table 4-5, the opae was the most conspicuous species that was found in most of the east Maui streams except Punalau and Ohia. Since Waiohue Stream already has a great diversity of native stream animals under diverted conditions, it has the potential to carry a full compliment of native stream fauna if allowed continuous mauka to makai flow.

## 5.0 Outdoor Recreational Activities

Water-related recreation is an integral part of life in Hawaii. Though beaches may attract more users, the value of maintaining streamflow is important to sustaining recreational opportunities for residents and tourists alike. Streams are often utilized for water-based activities, such as boating, fishing, and swimming, while offering added value to land-based activities such as camping, hiking, and hunting. Growing attention to environmental issues worldwide has increased awareness of stream and watershed protection and expanded opportunities for the study of nature; however, this must be weighed in conjunction with the growth of the eco-tourism industry and the burdens that are placed on Hawaii's natural resources.

The State of Hawaii Department of Health (DOH) maintains water quality standards (HAR 11-54) for recreational areas in inland recreational waters based on the geo-mean of *Enterococcus*, a fecal indicator: 33 colony-forming units per 100 mL of water or a single-sample maximum of 89 colonies per 100 mL. This is for full-body contact (swimming, jumping off cliffs, etc.). If *Enterococcus* exceeds those values, the water body is considered to be impaired. DOH also has a standing advisory for *Leptospirosis* in all freshwater streams. The marine recreational zone, which extends from the shoreline seaward to 1,000 feet from shore, requires an *Enterococci* geo-mean of less than 7 colony-forming units per 100 mL of water, to protect human health.

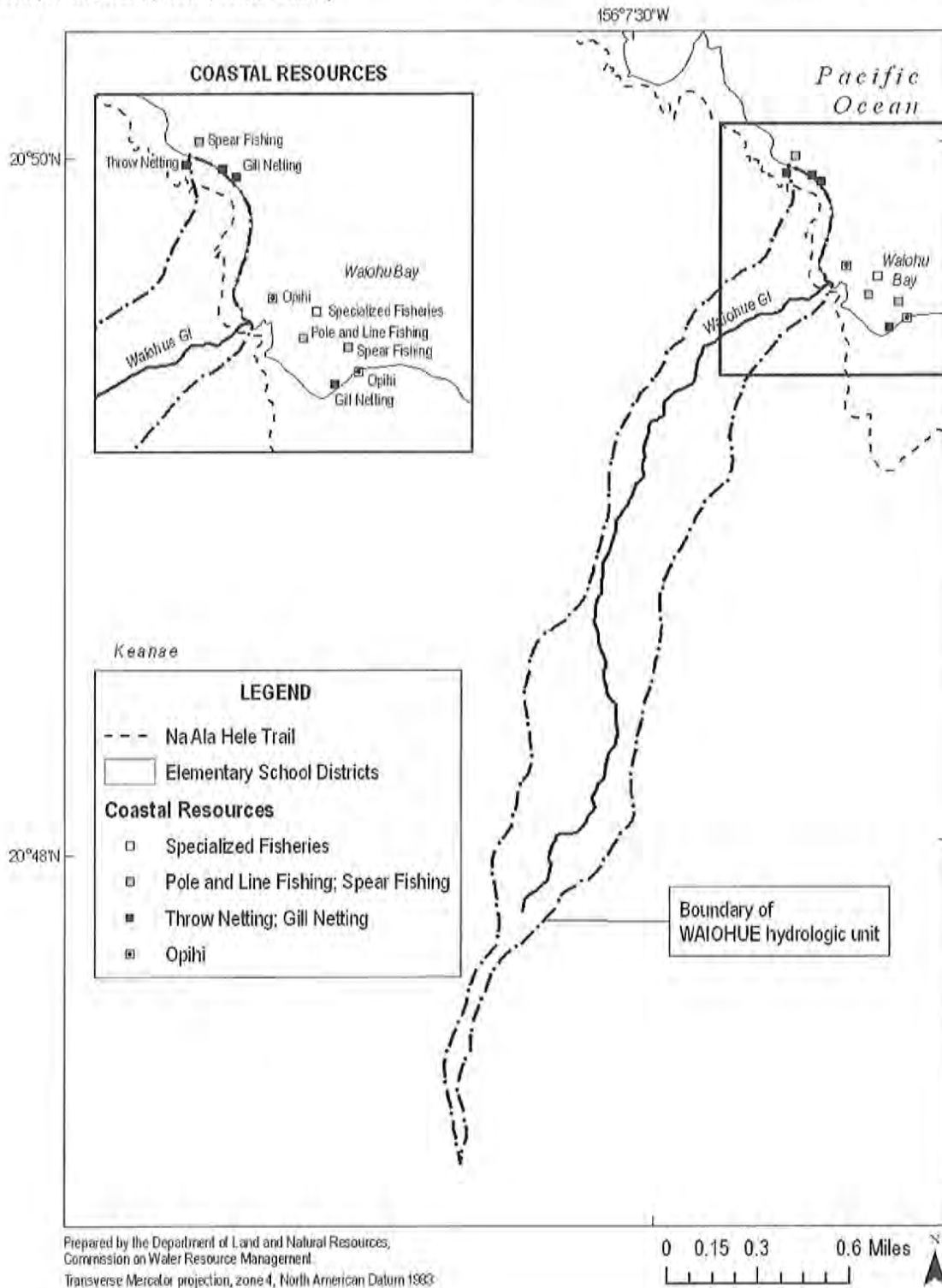
The recreational resources of Waiohue Stream were classified as "outstanding" by the HSA's regional recreation committee. The HSA identified opportunities for camping, hiking, fishing, swimming, parks, and scenic views related to Waiohue. Of these six recreational opportunities, only parks was not considered to be a high-quality experience (National Park Service, Hawaii Cooperative Park Service Unit, 1990) (Table 5-1).

**Table 5-1.** Hawaii Stream Assessment survey of recreational opportunities by type of experience.

	Urban		Country		Semi-Natural		Natural	
	Norm	High	Norm	High	Norm	High	Norm	High
Camping				■				
Hiking				■	■		■	
Fishing				■		■		■
Hunting								
Swimming				■				
Boating								
Parks			■					
	Trail		Road		Ocean		Air	
Scenic Views		■				■		■
Nature Study	Educational		Botanical					

According to public hunting data, Hunting Unit B on the island of Maui consists of portions of the Koolau Forest Reserve and Hunting Unit N1 consists of portions of the Hanawi Natural Area Reserve. Hunting Unit B within Waiohue occupies approximately 52 percent of the hydrologic unit, and Hunting Unit N1 occupies 10 percent of the unit (Figure 5-1). A permit is required for the hunting of wild pigs and goats, using rifles, shotguns, bows and arrows, and dogs. Bag limits are two pigs and two goats of either sex per day, while the hunting season is open year-round on Saturdays, Sundays, and State holidays. Handguns are allowed for the hunting of pigs with or without dogs.

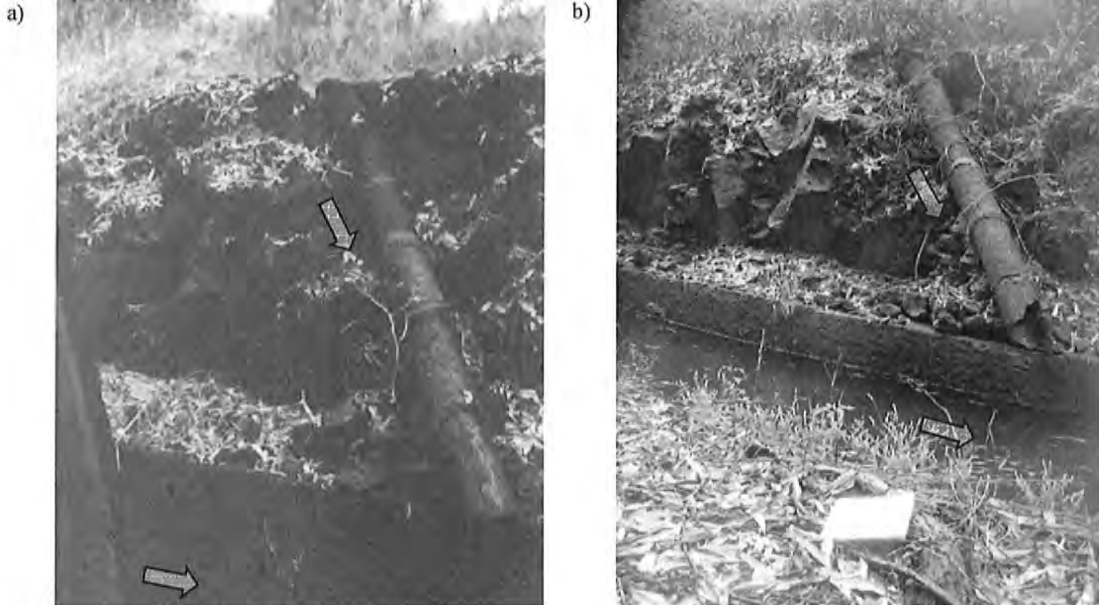
Figure 5-2. Recreational points of interest for Waiohue hydrologic unit (Source: State of Hawaii, Office of Planning, 1999, 2002a; 2002c; 2002d; 2004a; USGS, 2001b).



**Table 13-2.** Minor diversions on the EMI System in the Waiohue hydrologic unit.

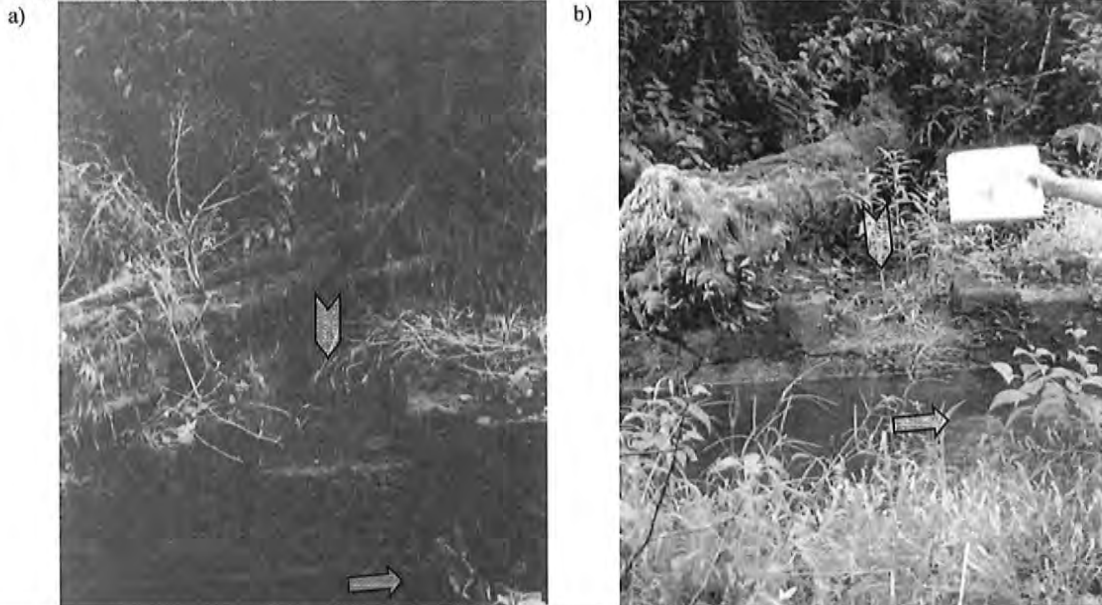
Diversion ID	EMI Ditch System	Description
K-11c	Koolau	West Puakea 8-inch concrete pipe run-off intake.

**Photos.** a) Surface water runoff is captured by an 8-in. concrete pipe that drops water into the Koolau Ditch on the left bank of the ditch (EMI 05/1989); Another view of the inflow (RMT, 09/2007).



K-12a                      Koolau                      Waiohue concrete channel intake.

**Photos.** a) Tributary seeps flow directly into the Koolau Ditch from the left bank of the ditch (EMI 05/1989); Another view of the inflow (RMT, 09/2007).



**Table 13-2.** Continued. Minor diversions on the EMI System in the Waiohue hydrologic unit.

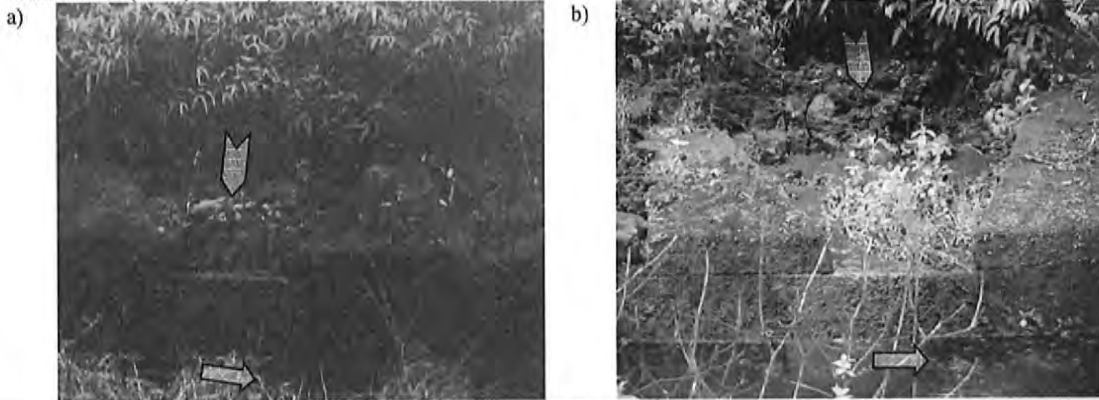
Diversion ID	EMI Ditch System	Description
K-12b	Koolau	East Waiohue concrete channel intake.

**Photos.** a) Tributary seeps flow directly into the Koolau Ditch from the left bank of the ditch (EMI 05/1989); b) Another view of the inflow (RMT, 09/2007).



K-12c                      Koolau                      East Waiohue concrete V-channel intake.

**Photos.** a) Tributary seeps flow directly into the Koolau Ditch from the left bank of the ditch (EMI 05/1989); Another view of the inflow (RMT, 09/2007).



**Table 13-2.** Continued. Minor diversions on the EMI System in the Waiohue hydrologic unit.

Diversion ID	EMI Ditch System	Description
K-12d	Koolau	East Waiohue 8-inch concrete intake.

**Photos.** a) Concrete catch basin captures seepage and conveys water to Koolau Ditch via an 8-in. pipe (originally concrete) (RMT, 09/2007); b) Remaining portion of original 8-in. concrete pipe drop water into the Koolau Ditch (RMT, 09/2007).

a)



b)





CODE	NAME	AQU	RIP	CUL	REC	CODE	NAME	AQU	RIP	CUL	REC
<b>Maui</b>						6-4-13	Waiokamilo				O
6-1-01	Ukumehame	S		S	M	6-4-14	Wailuanui	O	S	S	O
6-1-02	Olowalu	S		S		6-4-15	W. Wailuaiki	M	S		O
6-1-03	Launiupoku				M	6-4-16	E. Wailuaiki	M	O		O
6-1-04	Kauaula	L				6-4-17	Kopiliula	M	O		S
6-1-05	Kahoma	M	O	S	S	6-4-18	Waiohuc Gl.	O			O
6-1-06	Wahikuli					6-4-19	Paakea	M			S
6-1-07	Honokowai	L	O	S	S	6-4-20	Waiaaka				S
6-1-08	Kahana					6-4-21	Kapaula	L			S
6-1-09	Honokahua			S		6-4-22	Hanawi	O	O		O
6-1-10	Honolua	L		O		6-4-23	Makapipi	O		O	S
6-1-11	Honokohau	O	S	O	S	6-4-24	Kuhiwa		S		S
6-2-01	Poelua					6-4-25	Waihole				M
6-2-02	Honanana			L		6-4-26	Manawaikeae				S
6-2-03	Kahakuloa	O	S	O	M	6-4-27	Kahawaihapapa				S
6-2-05	Waiolai			S		6-4-28	Keaiki				S
6-2-06	Makamakaole	O		S	O	6-4-29	Waioni				S
6-2-07	Waihee R.	O		O	O	6-4-30	Lanikele				S
6-2-08	Waichu	S		S	M	6-4-31	Heleleikeoha		S		S
6-2-09	Iao	S	S		O	6-4-32	Kawakoe				O
6-2-10	Waikapu	S	O	S	S	6-4-33	Ulaino	O		S	S
6-3-01	Maliko			S	S	6-4-34	Kawaipapa			S	M
6-3-02	Kuiaha					6-4-36	Unnamed				
6-3-03	Kaupakulua			S	M	6-5-01	Moomoonui			S	M
6-3-04	Manawaiiao					6-5-02	Hancoo			S	M
6-3-05	Uaoa					6-5-03	Kapia	O			S
6-3-07	Kakipi			S	M	6-5-04	Waiohonu		S	S	S
6-3-08	Honopou			S	M	6-5-05	Papaahawa-hawa			S	S
6-3-09	Hoolawa	L		S	S	6-5-06	Alaaula			S	S
6-3-10	Waipio					6-5-07	Wailua	O			O
6-3-11	Hanehoi					6-5-08	Honolewa	O			O
6-3-12	Hoalua			S		6-5-09	Waieli	O			O
6-3-13	Hanawana			S	M	6-5-10	Kakiweka	O			S
6-3-14	Kailua	M		S	S	6-5-11	Hahalawe	O			O
6-3-15	Nailiilihaele	L			M	6-5-12	Puaaluu	O		S	O
6-4-01	Oopuola				S	6-5-13	Oheo Gl.	O	O	S	O
6-4-02	Kaaiea				S	6-5-15	Koukouai			O	O
6-4-03	Kolea					6-5-16	Opelu				S
6-4-04	Waikamoi	L	S		S	6-5-17	Kukuiula	O			S
6-4-06	Puohokamoa	L	S		S	6-5-18	Kaapahu				S
6-4-07	Haipuaena	L			M	6-5-19	Lelekea			O	S
6-4-08	Punalau	L				6-5-20	Alelele	O		S	O
6-4-09	Honomanu	L	O		O	6-5-21	Kalepa			S	O
6-4-10	Nuaailua	L			S	6-5-22	Nuanuaaloo				S
6-4-11	Piinaau	O	O		O	6-5-24	Manawainui	O		O	O
6-4-12	Ohia			S	S						

**Table 1 Candidate Streams for Protection**  
(Approach 2 Results: Streams that met either the diversity or blue ribbon criteria)

Code HSA Stream Code Island-Hydrographic Unit-Stream  
Stream Stream Name

Diversity of resources: To meet diversity criteria a stream must be outstanding in 3 or more resource areas  
 Aq Aquatic  
 Cu Cultural  
 Rc Recreation  
 Rp Riparian

Blue Ribbon Resources: The few very best resources  
 Aq Aquatic: Met 3 out of 5 criteria for outstanding  
 Cu Cultural: Very high sensitivity, high density, predictability and sensitivity, or over 50 acres of taro cultivation.  
 Rc Recreation: Statewide outstanding streams  
 Rp Riparian: Met score of 7.

CODE	STREAM	DIVERSITY	BLUE RIBBON
<b>Kauai</b>			
2-1-04	Kalalau	AqCuRc	AqCu
2-1-07	Hanalei	AqCuRc	
2-1-10	Hanalei	AqCuRc	AqCuRc
2-1-11	Maunapoulo	AqCu	AqCu
2-1-14	Wainiha	AqCuRc	Aq
2-1-15	Lumaha	AqRcCu	AqRp
2-1-18	Waioli	Rc	Rc
2-1-19	Hanalei	AqRcCuRc	AqRcCuRc
2-2-08s	Waiaha S.	RcCuRc	RcCuRc
2-2-15	Huleia	AqRcRc	Rp
2-3-07	Hanapepe	RcCuRc	RcRc
2-4-04s	Waimea S.	RcCuRc	RcRc
2-5-16	Nualolo	AqRcCuRc	Rp
<b>Oahu</b>			
3-1-18	Kahana	AqRcCuRc	CuRc
3-2-13	Maunawili	RcCuRc	Cu
3-4-02	Halawa	Cu	Cu
3-5-05	Kaupuni		Cu
3-6-04	Makaleha		Rp
3-6-06s	Kiiki S.		Rc
<b>Molokai</b>			
4-1-01	Waihanau	Cu	Cu
4-1-03	Waikolu	AqRc	Aq
4-1-09	Pelekunu	AqRcCuRc	AqCu

CODE	STREAM	DIVERSITY	BLUE RIBBON
4-1-15	Wailua	AqCuRc	CuRc
4-1-21	Halawa	AqCuRc	AqCuRc
4-2-04	Waialua	CuRc	Rc
<b>Maui</b>			
6-2-07	Waieco	AqCuRc	CuRc
6-2-08	Waiehu		Cu
6-2-09	Iao	Rc	Rc
6-2-10	Waikapu		Rp
6-4-11	Piinaau	AqRcRc	AqCu
6-4-18	Waiohioe Gl.	RcAq	Aq
6-4-22	Hanaui	AqRcRc	AqRp
6-5-13	Ohelo Gl.	AqRcRc	AqRc
6-5-24	Manawainui	AqCuRc	
<b>Hawaii</b>			
8-1-11	Halawa	Cu	Cu
8-1-15	Pololu	RcCuRc	RpCu
8-1-16	Homokane Nui	CuRc	Rc
8-1-35	Waimanu	RcCuRc	RpCuRc
8-1-44	Waioae/Waipio	AqRcCuRc	RpCu
8-1-45	Lalakea	AqCu	CuRc
8-2-33	Kolekole	AqRc	Rc
8-2-56	Honouliuli	AqRcRc	Aq
8-2-60	Waiau	RcRc	Rc
8-5-03	Waiohioe	Cu	Cu

# World of Waterfalls

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## Puaa Kaa Falls (Pua'a Ka'a Falls)

Hana Highway (Maui Island), Hawaii, USA

Rating: 1 Difficulty: 1



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Photo

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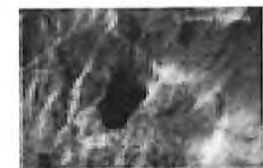
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Prior to the Mothers Day landslide that killed 3 people and injured 50 others, on Mothers Day of 1999, Sacred Falls State Park was my favorite hike on this Island. [\[more\]](#)



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Ahoy! On or about June 1975, on an afternoon helicopter ride with Jack Hunter, out of one Kauii Surf hotel, he'll tell us were flying west of Kapala... [\[more\]](#)

## Sandra Bullock Exposed!



2010



2014

**Sandra Bullock's REAL anti-aging secret! Her fans are in shock!**



Puaa Kaa Falls (or Pua'a Ka'a Falls; rolling pig) resides in the Pua'a Ka'a State Wayside Park, which made it one of the rare waterfalls on the Hana Highway where public access was welcome.

For one reason or another, we overlooked this park in our 2003 visit. And then in our 2007 visit, the park was closed due to sewage work (a real bummer, so I guess we weren't welcome here after all).

Anyways, there are two waterfalls in the park. The first one (see the photograph at the top of this page) was real easy to see as it was right by the official car park. I'm guessing it was about 15-20ft tall. It looked like it would've been a real nice place for a picnic, but I believe the water diversion from EMI ditches further upstream tends to keep the water flow low unless it has raining like it was during our visit.

I had read that it's possible to do some awkward, muddy scrambling past this lower waterfall, and then walk atop an embankment above a water diversion ditch (very scary for those afraid of heights apparently). That ultimately leads to a second (upper) similar waterfall whose water flow has not been diverted (for better flow). I'll have to come back here one of these days to check out that waterfall.

**EXHIBIT E-59**

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Reviewed September 15, 2013

On the road to Hana we hit several falls for quick swims, and checked this place out. Very nice place to cool off.

Was this review helpful?

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### "Favorite Lunch Stop Along the Hana Highway"

Reviewed May 28, 2012

This is our favorite stop along the Hana Highway for a picnic lunch, to take in the beauty of the rainforest with an opportunity to swim in the small natural pool under the waterfall although there was not enough water in the pool during our recent visit during the dry season. Clean restrooms are also available.



Was this review helpful?  1

### "Refreshing swim in a waterfall pool"

Reviewed January 17, 2012

Along the beautiful drive to Hana, make sure that you stop for a rest at the Puu'a Ka'a State Wayside Park. There is a beautiful waterfall pool that you can take a refreshing swim in. It is a bit chilly, but on a hot day, you'll really appreciate it.



See all travel guides

## Popular Maui attractions

- Piipiwai Trail
- Haleakala Crater
- Waianapanapa State Park
- Haleakala National Park
- Keawakapu Beach
- Mauka Beach
- Napili Beach
- Kaanapali Beach
- Kapalua Coastal Trail
- Wailea Beach
- Kapalua Beach
- Ula'ena by Maui Theatre
- Ho'okipa Beach Park
- Kamaole Beach Park II
- Uluva Beach
- Kamaole Beach Park 3
- Lahaina Front Street
- Lahaina United Methodist Church
- Ahihi-Kinohao Natural Area Reserve
- Red Sand Beach

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MINUTES  
FOR THE MEETING OF THE  
COMMISSION ON WATER RESOURCE MANAGEMENT

**DATE:** May 25, 2010  
**TIME:** 1:00 pm  
**PLACE:** Paia Community Center  
Hana Highway  
Paia, Maui

Chair Laura Thielen called the meeting of the Commission on Water Resource Management to order at 1:12 p.m.

The following were in attendance and/or excused:

**MEMBERS:** Ms. Laura Thielen, Dr. Chiyome Fukino Dr. Lawrence Miike, Mr. Neal Fujiwara, Ms. Donna Kiyosaki, Mr. William Balfour, Jr.

**STAFF:** Ken Kawahara, Roy Hardy, Dean Uyeno, Chui Ling Cheng

**EXCUSED:** Mr. Sumner Erdman

**COUNSEL:** Linda Chow, Esq.

**OTHERS:** Melit P. Medeiros; Alexandria R. Crisologo; Pauline Cachela, Tinidad Yadao; Trinidad Galapia; Aireliane Iaconsay; Josephine Baggao; Silvestre Baggao; Meby Damaran; Josefina Ngayan; Rosalinda O. Aganon; Valerio Pagador; Ignacio Corpuz; Aguifina Ibarra; Guiereo Rasay; Nestor Sorfrida; Noli R. Santos; Fredelito Pacadio; Geoff Haines; Koa Martin (HC&S); Matthew Kauhola Jr. (HC&S); Doug Kaleikini (HC&S); Gary F. Rodrigues (HC&S); Guy Kiane Jr. (HC&S); Julian Arlanger (HC&S); Douglas Cheehan (Kaman Ind. Tech.); Loreto Cabalse (HC&S); Burt Sato (HC&S); Jofrey Racardio (HC&S); Arnel Galo (HC&S); Mitchell MacCluer (CPS); Joseph Pascua; Wilmer Falix (HC&S); Justin Quenga (HC&S); Mario Olivera (HC&S); Alike Corpuz (HC&S) Mike Fernandez (HC&S); Canny Piller (HC&S); John Ravan (HC&S); Sernoma L. Nerona (HC&S); Orfelía Sagario (HC&S); Amgelita Vaspquer (HC&S); Glenda Ramiscal (HC&S); Laura Alfonso (Maui Petroleum); Carol Reimann (MHLA); Estelita Agoot (HCGS); Luzuimenda A. Agonay (HC&S); Felisa Eastaquio (HC&S); Laurenana Galapia (HC&S); Leonida Albano (HC&S); Susan Tumacoler (HC&S); Presentacion Castillo (HC&S); Elina Asunicion (HC&S); Mildred Pascua (HC&S); Alicia Ulep (HC&S); Juanito Mancesad (HC&S); Teresita M. Natividad (HC&S); Fracudes Gager (HC&S); Santos Rumbaoa (HC&S); Rogeueo O. Agubo (HC&S); Melony Norozian (HC&S); Corason Badua (HC&S); Keith Watimar (HC&S); Ruben Gallur (HC&S); Fanzel ? (HC&S); Thomas Pasqual (HC&S); Ernesto Ibarioa (HC&S); Calixto A. Agustin (HC&S); Alejandro Sagario (HC&S); Juanito Basuel (HC&S); Harold Galindo (HC&S); Michael Ross (HC&S);

**EXHIBIT 'E-60'**

Minutes

5/24/10

**C. STREAM PROTECTION AND MANAGEMENT**

1. Petition to Amend the Interim Instream Flow Standards for the Surface Water Hydrologic Units of Waikamoi, Puohokamoa, Haipuaena, Punalau, Honomanu, Nuaailua, Ohia, West Wailuaiki, East Wailuaiki, Kopiliula, Waiohue, Paakea, Waiaka, Kapaula, Hanawi, and Makapipi, Maui

Presentation by: Dean Uyeno and Chui Ling Cheng

Deputy Kawahara thanked the U.S. Geological Services (USGS), DAR, Native Hawaiian Legal Corporation (NHLC), East Maui Irrigation (EMI), Hawaiian Commercial and Sugar (HC&S) Company, Maui County Department of Water Supply (Maui DWS), Na Moku 'Aupuni o Ko'olau Hui (Na Moku), Nahiku Community Association, and the various community groups that shared information with the staff. He also recognized the community's willingness to work together and in the past three years has cleared up much confusion and made the process easier. He repeated something that he said back in December, "There are really no bad uses for the water. If everyone can work together as a community, it's possible to seek a balance of the needs of both instream and offstream uses."

Deputy Kawahara mentioned that Ed Sakoda, Chief of the Stream Protection and Management Branch (SPAM), retired. Diane England, SPAM Branch geologist, also left the Commission. He commended the staff for being short-staffed and being able to put this together in a short period of time. Deputy Kawahara recapped that the first five (5) hydrologic units comprised of eight (8) streams and the remaining 16 hydrologic units comprised of 19 streams. He noted that multiple streams could be in one hydrologic unit.

Dean Uyeno gave an overview of the staff presentation. He mentioned he would quickly discuss the first three topics of the presentation, which were system loss considerations, ground water considerations, and alternative sources considerations. Chui Ling Cheng would then discuss in more detail the interim IFS approach, the minimum flow calculations, and the streams staff recommended for restoration. At the end of the presentation, the staff would discuss the proposed adaptive management strategies.

**System Loss Considerations.** Information on system losses were taken from the additional data the Commission requested at the December 2009 Commission meeting. Mr. Uyeno noted that the EMI System is 75 miles long, with 50 miles of tunnel and 25 miles of open ditch. While approximately 50 miles of the system is lined in some fashion, HC&S was unable to provide an estimate of water loss. However, the EMI system is monitored at 12 telemetry stations and that the system undergoes regular inspection and maintenance. Water on the HC&S plantation is used in conjunction with 36 reservoirs, 31 of which are unlined. According to the 1960 data, EMI estimated 23 to 31 million gallons per day of seepage losses from these reservoirs. These estimates are based on furrow irrigation practices when the water was stored in the reservoir for longer periods of time. Drip irrigation practices now rely on the reservoirs more as collection points.

Mr. Uyeno continued that Maui DWS estimated their system losses for the upcountry system to be approximately 14 percent. Mr. Uyeno said that the County has initiated an ongoing leak detection program to help reduce system losses. A greater concern is the system loss from the wooden

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Waikamoi Flume on the upper Kula Pipeline. According to Maui DWS, the Waikamoi Flume Rehabilitation Design project was underway with the intent to begin construction once the design portion is complete. Mr. Uyeno emphasized that some of the adaptive management strategies in the recommendations are aimed to address some of these system loss concerns.

**Ground Water Considerations.** At the December 2009 Commission meeting, the Commissioners also asked the key stakeholders to look at ground water sources, and whether increasing ground water withdrawal was an option. Staff found that most of the pumping occurred at the Paia and the Kahului aquifer systems, and that reported pumpage regularly exceeded estimated ranges of sustainable yield. Mr. Uyeno noted that a table in the submittal illustrated the exceeded pumpage. The upper range of the sustainable yields reflected the possibility of return irrigation recharge and leakage from reservoirs and ditches. The staff is currently working with USGS to take a closer look at this issue. EMI currently relies on 16 brackish water wells that pump on average 72 million gallons per day. Considering the current sustainable yield and reported pumpages, it was unlikely that HC&S could sustain or even increase its use of brackish water.

Mr. Uyeno continued that Maui DWS reported that developing more ground water sources to reduce surface water demand would cost over \$117 million over a 25 year planning period. Approximately 85-percent of the total cost would be attributed to electrical pumping costs. Mr. Uyeno added that the County provided five strategies that may address the anticipated Upcountry system demands. The five strategies are outlined in the submittal and in Exhibit 3, which included all the data submissions from the various parties.

**Alternative Source Considerations.** As indicated in the submittal and exhibit 3, HC&S discussed waste water reclamation, watershed catchment, stormwater reclamation, desalinization, developing new wells and weather modification (i.e., cloud seeding). Maui DWS identified various alternatives, such as an exchange of Hamakuapoko well water for Wailoa Ditch water, recycled water, and reclaimed stormwater. Various other strategies are discussed in the county Water Use and Development Plan.

**Interim IFS Approach.** Ms. Cheng reported that staff considered two approaches to setting interim IFS, the annual and the seasonal approach. The annual approach is similar to what was discussed at the December 2009 staff recommendation, which was to maintain one measurable flow standard all year round. Contrary to popular belief, streams in east Maui do not exhibit a seasonal flow pattern. The presentation slide showed a graph of the streamflow for Puohokamoa, West Wailuaiki, Paakea and Hanawi streams. The left of the graph illustrated the dry season from the months of May to October, and the right of the graph illustrated the wet season from the months of November to April. Ms. Cheng explained that all four trends showed no typical wet winter or dry summer trend, and that high streamflow occurs in both wet and the dry seasons. From the stream's perspective, the annual approach would restore streamflow to the natural flow pattern for the entire year. Since the stream animals respond to the natural flow pattern where high streamflow triggers spawning and recruitment, the annual approach would be supporting long-term growth and reproduction for the full year.

The second approach that the staff considered is the seasonal approach, which was first discussed at the December 2009 Commission meeting. Under the seasonal approach, two flow standards would be set - one in the summer and one in the winter season. Ms. Cheng added that contrary to east

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Mr. Murakami agreed. Mr. Murakami noted that Mr. Kimo Day, who had to leave, was going to testify as a fisherman that even though there is a major losing stream, such as Honomanu, water that disappears underground still creates a healthy estuarine environment. Chair Thielen noted that as far as the seasonal approach and the staff recommendation as an option, the streams are gaining streams.

### HC&S (Chris Benjamin, General Manager; Rick Volner, Senior Vice President; Garrett Hew, Water Resources Manager)

Mr. Benjamin started by stating that the Waiahole case is different from the east Maui case in that the former dealt with the allocation of unused water abandoned by prior users, whereas the latter concerns fully committed water provided by people in businesses today and determination of whether that water should be restored to the streams. Mr. Benjamin said that HC&S recognizes the need for compromise and have constructively participated in the daily gatherings and discussions leading up to this Commission meeting. While HC&S does not entirely support staff's recommendations, they do support the recommendation on Makapipi stream and the concept of wet season releases; however, HC&S has concerns about releases on both East and West Wailuaiki streams, and most importantly, they oppose any dry season flow releases other than on Makapipi Stream.

Mr. Benjamin noted the importance of the sequence of events leading up to this Commission meeting, and that this decision on the 19 streams could not be looked at in isolation with the previous 8 streams the Commission ruled on nearly two years ago. The Commission provided restoration in five out of eight streams to meet the taro needs. Although not the primary purpose of the instream flow standards, the flow restoration also provided additional stream habitat in the prior decision. The flow releases are estimated to be 10 mgd on average, not the 4.5 mgd as noted in the staff submittal.

Mr. Benjamin explained that last December, the Commission took action on the remaining 19 east Maui streams, streams where there were no known taro cultivation except for one stream (i.e., Makapipi Stream) that was not diverted by EMI. These streams were gaining streams and staff concluded that the stream reaches below the diversions were believed to support current instream uses. Flow release was recommended only for Makapipi Stream.

By the end of the December 2009 Commission meeting, wet season releases were emerging as an acceptable compromise for instream and offstream demands. Data collection detailed their wet season vs. dry season water needs, provided available data on brackish water wells, reservoirs and diversion structures, provided research performed on potential alternative sources of water including catchment systems, and fish pathways to aid migration. HC&S needs all the east Maui water it uses, utilizes their ground water wells to maximum the extent, and does not have any viable alternative sources for this east Maui stream water at this time. The data provided further proof that there is direct correlation between higher water availability and higher yields at HC&S. HC&S believes that the staff recommendation reflects both a degree of restoration and seasonality that would be too costly for the public. It's too much water and much of it would be taken at a time when it's needed most. Unfortunately, both options presented for annual and seasonal approaches incorporated dry season releases that would have a significantly greater impact on existing uses than releases in the wet season.



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Mr. Benjamin said what the staff's analysis lacks is the wet season vs. dry season demands for east Maui water. He showed a chart that overlaid HC&S season needs on Figure 7 of the submittal which is considerably larger in the dry season than the wet season. Figure 7 depicts median flows over a 65 year period which serves to mask the actual high and low flows that is experienced on a daily basis with ditch flows. During low flow times, the combined effect of the IFS imposed previously on the five east Maui streams plus the proposed dry season IFS for these six additional streams will result in as much as a 50-percent reduction in the water available for the County and HC&S. Mr. Benjamin noted the restoration of water via the Commission's earlier decision on the first set of east Maui streams and that decision on releases in Na Wai Eha is still pending. From HC&S vantage point, reductions in surface water available to HC&S also reduce groundwater available due to reductions in irrigation recharge. Furthermore, the Commission's prior action on the first set of streams and staff's proposal results in a considerable amount of water being restored from one region that is a reliable producer of water during low rainfall times.

From a biological perspective DAR advocates spreading restoration out geographically. Mr. Benjamin said that the proposed IFS for east Wailuaiki be accepted but the IFS for west Wailuaiki be rejected. A zero dry season release is the right thing to do for the recommended streams because there are no known taro needs on these streams and no new data was presented, these are gaining streams, offstreams users have no alternative sources of water to compensate for instream releases, the DAR submittal indicated that the recommended dry season flows are too low to expect suitable long-term growth and reproduction of native stream animals, and DAR also stated that additional habitat created in the wet season is of significant biological benefit. He noted that the Code specifically requires the Commission to consider economic impacts when setting an interim IFS and that the submittal falls short of addressing economic impacts of the proposed stream restorations on offstream users.

Mr. Benjamin indicated that he is concerned of staff's statement on page 15 of the submittal that with decreasing trends in streamflow, east Maui streams will continue to be an insufficient supply of surface water needs for the plantation regardless of the interim IFS adoption. This seems to imply that because HC&S is water-short, being more water-short won't matter. Despite losses of \$30 million the prior year, operational results have improved dramatically. In addition, federal research support for renewable energy efforts are encouraging; however parties looking to partner with HC&S often ask whether there will be enough water available to produce sufficient biomass to warrant the investment necessary for the biofuel industry. Mr. Benjamin urged the Commission to follow through with the direction indicated in the December meeting, reject the concept of ordering additional releases in the dry season, and look only at the proposed wet season releases. He believed that the wet season-only IFS is an appropriate compromise because, in totality, the Commission would have provided water for known taro farmers, additional stream habitat, and gathering rights in east Maui, while having properly performed the weighing test required by the Code.

Dr. Miike referred to HC&S' statement that staff failed to provide an analysis of economic impact, but he believed that all the information provided by HC&S and their employees testifying indicate the dire consequences of the entire operation going out of business. He believed what the staff asked is what would be the incremental effect by reducing available water by 1-, 5-, 10-, 15-percent upon the business. HC&S has managed to still be in operation when the stream waters were decreasing over the past 20 to 30 years, so there has not been information provided by HC&S to say

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what the economic impact would be from incremental decreases of water for the plantation. Dr. Miike found it offensive what Mr. Benjamin was telling the Commission staff.

Mr. Benjamin responded that their yields over the last several years show a downward trend that has been driven by the reduction of water availability. There's no question about the relationship between water and yields, and there's also no question about the relationship between yields and revenue. It is well documented that there have been significant investments in drip irrigation, recirculation of water, and other things to maximize the use of water. The best reference in the staff's submittal is the fact that HC&S is pumping the aquifers to the maximum extent possible. Dr. Miike noted that that was not his question, but rather why has HC&S not provided information about what would happen to the operation (i.e., profitability, going out of business, etc.) if there were incremental decreases of water availability. All the information the Commission has is if HC&S were to go totally out of business. Mr. Benjamin said that the analysis that was done and has been referenced in the past, shows that there is an over 95-percent correlation between water application and sugar yields and that the relationship there is every million gallon of water can produce four tons of sugar. That relationship is critical because every million gallons of water that HC&S loses results in four tons less of sugar. Dr. Miike then asked at what point would HC&S go out of business. Mr. Benjamin noted that there are many complexities and variables in business. Dr. Miike compared Mr. Benjamin's response to a scientist saying that more research was needed, but then stated that the presentation by staff did not contain an explanation of HC&S' reasonable uses but noted that it was provided in Exhibit G-1 (of Exhibit 2, Compilation of Data Submissions, Part II) that provided HC&S' average monthly water need and availability.

Dr. Miike noted that he was confused by the last column in the table that depicted monthly deficits, where the highest one was 108, yet it also showed 165 and 230 mgd. Then he realized that the 165 and 230 mgd was the difference between what was calculated as water need minus ground water contributions so that's what was needed from surface water. So the real numbers really should be 8.4 million and 71 million gallons per day instead of 165 and 230 shown. Chair Thielen clarified with Dr. Miike which table he was referring to, which she then noted was the one Garret Hew had just passed out.

Rick Volner indicated that the right column is the per day deficit, the difference between the total water needed subtracting out the average water deliveries, then subtracting out the average well water. Chair Thielen clarified that the numbers Dr. Miike was referring to were at the bottom of the last column (165,919,453 and 230,623,125 gpd). Mr. Volner noted that those were summary rows for both the dry and wet seasons and what they would need, on average, from surface water. Dr. Miike clarified that the deficit in Nov-Apr is really 8.4 million and May-Oct is 71.3 million if the averages are added together. Dr. Miike asked if it was correct that HC&S had a deficit in the wet season of 8 million gallons per day and in the dry season 71 million gallons per day. Mr. Volner responded that was correct.

Dr. Miike continued that he believed HC&S had a 20-percent overestimate of their need. He explained that if you start with daily evapotranspiration rates and transfer that into gallons per acre per day. In the text along with the table, HC&S didn't count any rain water with the reason being that it is reflected in evapotranspiration rates, but what is reflected in the evapotranspiration rates is higher humidity at lower temperatures. They also said that it might rain so much that it overflows

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under-designed, so he really can't answer that. Director Eng noted that they were fortunate that when the design consultant inspected it back in March they went up there during a storm period so they could see the magnitude of water and believes they will design the new flume based on their observations. Chair Thielen said the Commission walked that system and doesn't think it's a matter of a single leak, but rather the system was leaking the entire length of the walk. She asked if they were to look at compensating or putting water back into the stream, which Maui County seems to support in concept, without harming people in the Upcountry area, replacing that flume with some kind of pipe system would be a situation where nobody Upcountry would lose any water and, in fact, might likely gain water while still having that stream restoration. So there is a recommendation in the staff submittal, recognizes the difficulties in contracting and procurement, but the bottom line is that Maui is dependent on 85-percent of its water from streams and Maui County is publicly supporting some stream restoration. If you take a look at who can bear the cost of developing alternative supplies and creating a better balance so that not so much is dependent on the stream, it would be a collective people of Maui which is represented by the Maui County.

Chair Thielen noted the recommendation in the submittal is that construction on a new or reconstructed flume begin in three years and that there be annual reports to the Commission in public meetings by Maui County until that reconstruction is completed. Is that acceptable to the County and Maui DWS. Director Eng agreed that it was. Chair Thielen also noted that some testifiers supported alternative water sources to be developed to change that balance so that the County isn't 85-percent dependent on stream water. Chair Thielen asked if that's something where, if there are requirements placed on Maui County, where Maui County would like to see some direction, focus or partnership with any of the parties here? There was some testimony about injection wells and instead using reclaimed water for agricultural purposes. Since Maui DWS gets a percentage out of the EMI ditch system, would the County be interested in working with HC&S on coordinating some alternative water being used for irrigation in exchange for increase in the percentage of stream water that goes to the County vs. for irrigation purposes in the fields? Are these things something the County would be interested in pursuing and if so, how can the Commission assist that with some guidance.

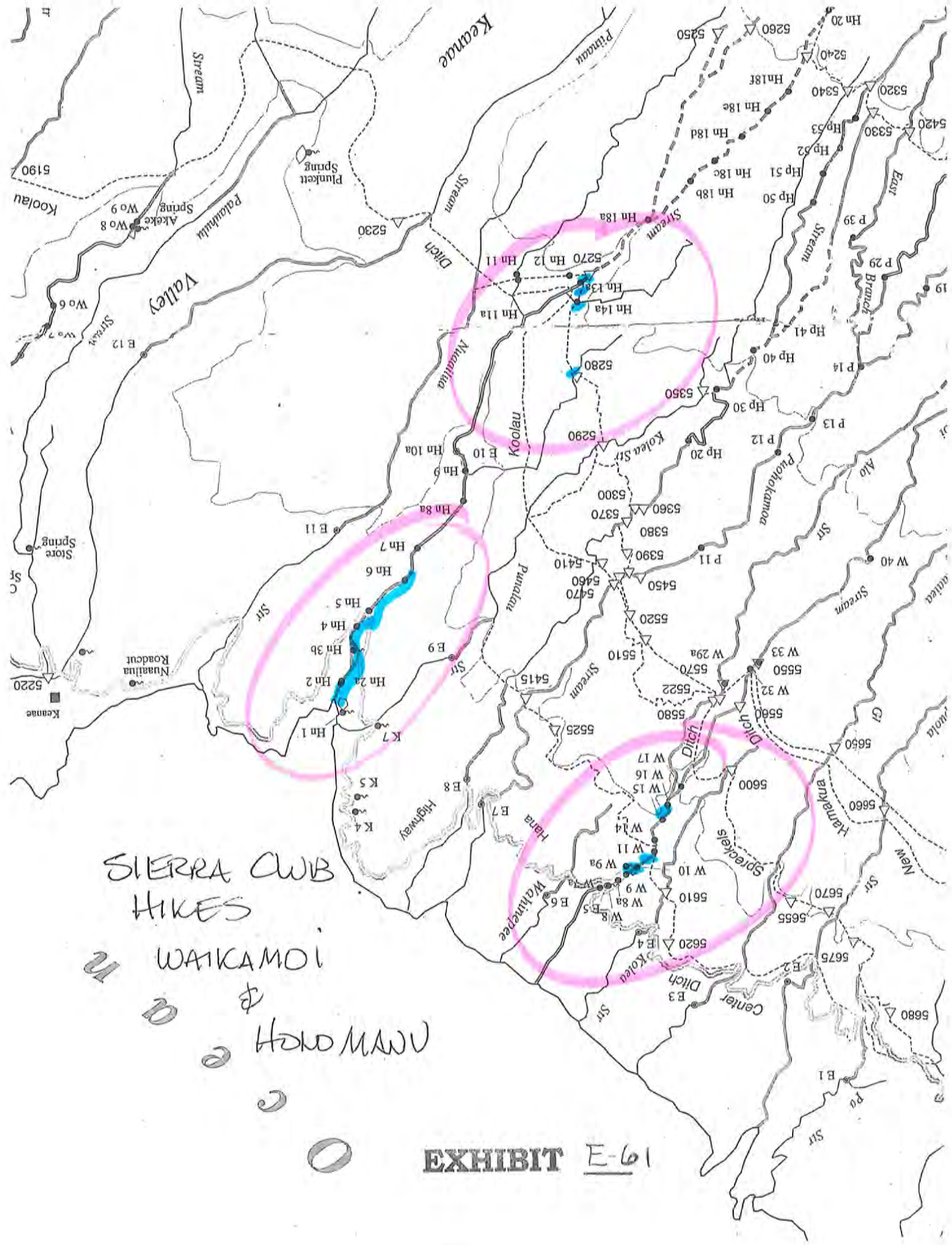
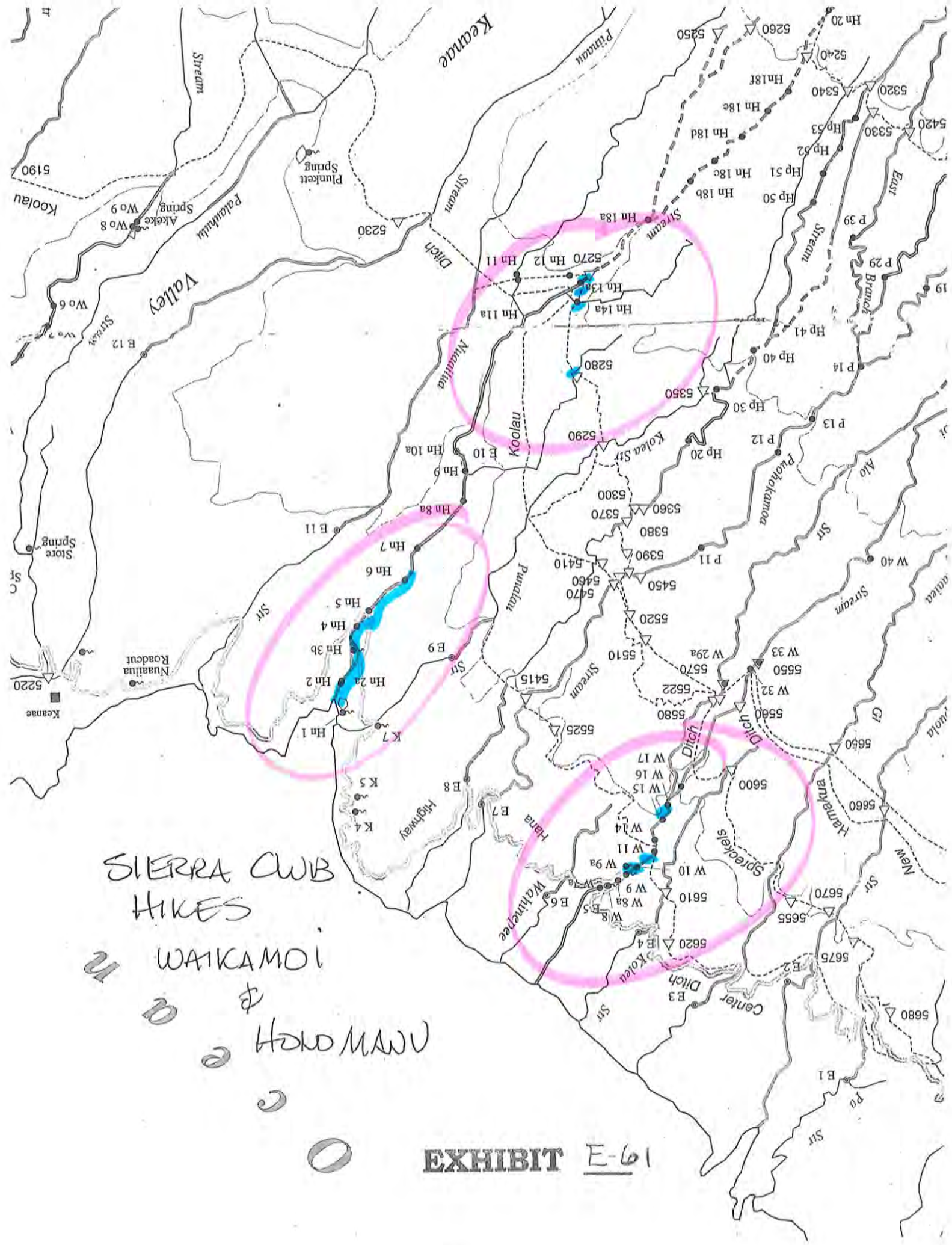
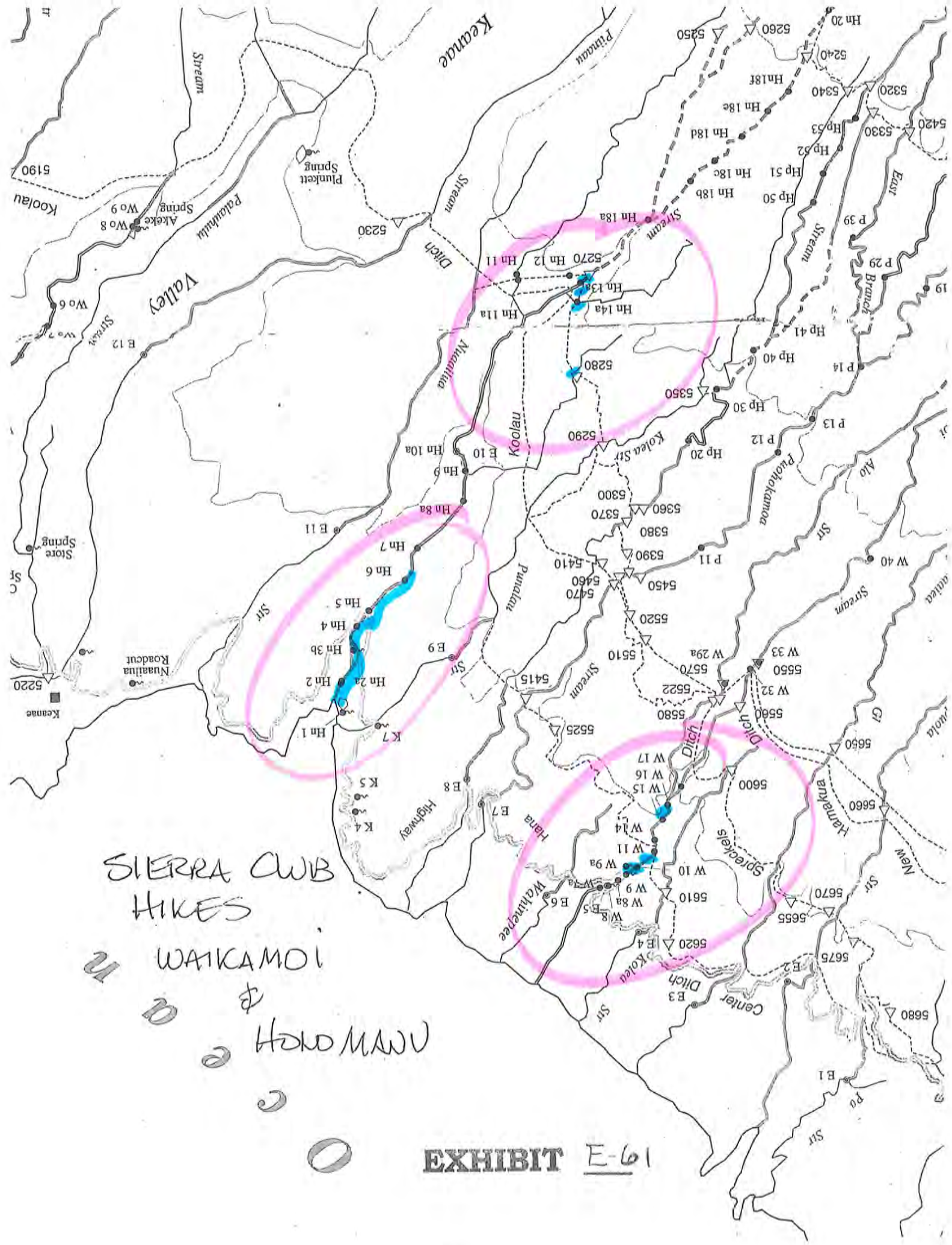
Director Eng said that they would like to partner with anyone they possibly can who can help develop alternative services. Maui DWS is currently looking at some new groundwater sites in the Haiku area but is facing some challenges from the community. He also noted water conservation efforts that Maui DWS is undertaking to improve water supply and reduce system losses. Chair Thielen agreed that water conservation is important, but emphasized that the County needs to take a look at shifting that balance of 85-percent reliance on stream water, so that the only major water developer is going to be the County. If water development is left in private hands, then they will develop water towards high end uses that can afford to pay those higher water rates which may not be the type of development that Maui County wants. Chair Thielen, in an effort to push Director Eng out of his comfort zone, emphasized that people need to address the reality that it's going to take everybody in this room having to bear a percentage of the cost of changing that balance within Maui County. The only entity that can have everybody share that cost is the government through the capitol improvement projects in the budget.

Director Eng commented on reclaimed water opportunities, stating that the County has no wastewater treatment facilities in Upcountry since most people are on cesspools and septic tanks so they don't have that reclaimed water opportunity. Chair Thielen stated that since Maui DWS takes

## Summary of East Maui Interim Instream Flow Standards

This table provides a summary of the interim instream flow standards (Interim IFS) for 19 east Maui streams approved by the Commission on Water Resource Management at its May 25, 2010 meeting.

	Interim IFS Amounts				Restoration Amounts				Altitude feet	Notes on Interim IFS Location (All interim IFS locations are located below all EMI diversions)
	Wet Season cfs	mgd	Dry Season cfs	mgd	Wet Season cfs	mgd	Dry Season cfs	mgd		
1 Waikamoi	2.80	1.81	0	0	2.60	1.68	0	0	550	Just above Hana Highway.
2 Alo	--	--	--	--	--	--	--	--	--	One measurable interim IFS established for Waikamoi Stream below the confluence with Alo Stream.
3 Wahinepee	0.50	0.32	(Annual)	(Annual)	--	--	--	--	575	Just above Hana Highway, as designated on October 8, 1988.
4 Puohokamoa	0.40	0.26	(Annual)	(Annual)	--	--	--	--	565	Just above Hana Highway, as designated on October 8, 1988.
5 Haipuana	0.10	0.06	(Annual)	(Annual)	--	--	--	--	510	Just above Hana Highway, as designated on October 8, 1988.
6 Punalau/Kolea	0.20	0.13	(Annual)	(Annual)	--	--	--	--	40	Just above Hana Highway, as designated on October 8, 1988.
7 Honomanu	0	0	(Annual)	(Annual)	--	--	--	--	20	Just above Hana Highway, as designated on October 8, 1988.
8 Nuaailua	3.10	2.00	(Annual)	(Annual)	--	--	--	--	110	Just above Hana Highway, as designated on October 8, 1988.
9 Ohia (Waianu)	4.60	2.97	(Annual)	(Annual)	--	--	--	--	195	Just above Hana Highway, as designated on October 8, 1988.
10 West Waitaiki	3.80	2.46	0.40	0.26	3.80	2.46	0.40	0.26	1,235	Just above Hana Highway.
11 East Waitaiki	3.70	2.39	0.20	0.13	3.70	2.39	0.20	0.13	1,235	Just above Hana Highway.
12 Kopiliula	0.50	0.32	(Annual)	(Annual)	--	--	--	--	1,270	Just above Hana Highway, as designated on October 8, 1988.
13 Puakaa	0.60	0.39	(Annual)	(Annual)	--	--	--	--	1,235	Just above Hana Highway, as designated on October 8, 1988.
14 Waiohue	3.20	2.07	0.10	0.06	3.2	2.07	0.10	0.06	1,195	Just above Hana Highway.
15 Paakea	1.50	0.97	(Annual)	(Annual)	--	--	--	--	1,265	Just above Hana Highway, as designated on October 8, 1988.
16 Waiaka	0	0	(Annual)	(Annual)	--	--	--	--	1,235	At Hana Highway, as designated on October 8, 1988.
17 Kapaula	0.20	0.13	(Annual)	(Annual)	--	--	--	--	1,194	Just above Hana Highway, as designated on October 8, 1988.
18 Hanawi	0.10	0.06	(Annual)	(Annual)	0.10	0.06	(Annual)	(Annual)	1,315	Below EMI's main Hanawi diversion (Intake K-3).
19 Makapii	0.93	0.60	(Annual)	(Annual)	0.93	0.60	(Annual)	(Annual)	935	Just above Hana Highway.



## ***Hihīwai (Neritina granosa Sowerby) Recruitment in 'Īao and Honomanū Streams on the Island of Maui, Hawai'i***

SKIPPY HAU

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### **Abstract**

Juvenile *hīhīwai (Neritina granosa)*, endemic freshwater snails of Hawai'i, were collected from 'Īao and Honomanū Streams on the island of Maui. Each stream has two or three diversions at various elevations which removes most of the stream flow before reaching the ocean. The lack of flow restricts *hīhīwai* to the estuary. Groundwater maintains freshwater habitats for their survival. Both sites were impacted occasionally by large ocean swells and extreme high tides that mixed salt water with fresh or formed berms that blocked stream flow to the ocean. *Hihīwai* continue to migrate from the ocean. This paper describes their recruitment and reviews some of the conditions found in each stream. Monthly counts were from 0-576 in 'Īao Stream (1999-2004) while Honomanū Stream counts were from 67-912 (2001-2004). Monthly shell lengths averaged from 1.5-6.1 mm in 'Īao Stream and 2.2-9.1 mm in Honomanū. The persistence of juvenile *hīhīwai* recruitment confirms the possibility for restoring native stream populations if "natural flow" is restored. Stream restoration should be based on the needs of the slowest migrating animal such as *hīhīwai*. A slow-migrating species like *hīhīwai* may be a good indicator of the adequacy of stream flow during stream restoration programs.

### **Introduction**

'Īao Stream is on the northeastern portion of the West Maui Mountains and Honomanū Stream is on the north flank of Hale'akalā volcano (Fig. 1). Both streams are in windward watersheds. These streams are home to a variety of native fauna including 'o'opu (fish), 'ōpae (shrimp), and *hīhīwai* (snail). During increased stream flows, larvae hatch from eggs and are transported to the ocean. After developing in the ocean for several months, they return to freshwater and migrate upstream as post larvae (Lindstrom & Brown, 1994; Nishimoto & Kuamo'o, 1997; Radtke *et al.*, 2001). In November 1997, after several weeks of stream flow, about 10 *hīhīwai (Neritina granosa)* were seen migrating upstream on the bottom of the concrete run in 'Īao Stream. The *hīhīwai* traveled more than 500 meters from the ocean. Diversions have reduced stream flow in 'Īao and Honomanū Streams and greatly reduced the migration success of native stream animals like *hīhīwai*. This paper will quantify the various size classes of *hīhīwai* found in each estuary.

### **Materials and Methods**

#### ***Study streams***

'Īao Stream is a second order stream more than 12 km in length. Pu'u Kukui is the highest point at 1764 m elevation and receives more than 900 cm annual rainfall. Part of 'Īao Stream was modified with concrete channels for flood control since 1981. Two diversions are connected to Maniania Ditch & 'Īao-Waikapu Ditch (240 m) and Waihe'e Ditch (80 m). The third diversion to the Kama Ditch (~123 m) is no longer being used.

Honomanū Stream is a second order stream about 14 km long. Headwaters are about 2700 m elevation. Three diversions are connected to the Lower Kula Pipeline (936 m elevation), Ko'olau/Wailoa Ditch (400 m), and Spreckels Ditch (529 m).

**EXHIBIT** E-62



Figure 1. 'Īao and Honomanū Streams on the island of Maui.

Most of the time, flow is absent in the lower sections of both streams. *Hihīwai* sampling was initiated to document their presence in the 'Īao (Fig. 2) and Honomanū (Fig. 3) estuaries. *Hihīwai* were collected by hand from each stream mouth for up to one hour each month. Rocks were turned over and examined for *hihīwai* attached to the bottom (Fig. 4). A mask and snorkel was used to collect *hihīwai* in the deeper Honomanū estuary. A refractometer was used to measure salinity changes in the estuary. Fresh water was present as groundwater seeps at both stream mouths even when surface flow was absent.

Maximum shell lengths of snails were measured with a set of calipers to the nearest 0.1 mm. After *hihīwai* were identified and measured, they were released in continuous parts of selected streams. Most of the *hihīwai* collected from 'Īao Stream were released in 'Īao State Park (above the 'Īao Valley intake).

Rainfall information for the Wailuku site came from a rain gauge (WUKH1) located at 55 m elevation while a neighboring Waikamoi rain gauge (#341) at 369 m elevation was used to approximate Honomanū rainfall. The Division of Water Resources Management, Department of Land & Natural Resources, provided monthly rainfall data.

### Results

Monthly counts varied from 0 to 576 *hihīwai* in 'Īao Stream while Honomanū Stream counts ranged from 67 to 912 (Fig. 5). Monthly counts for both streams increased during June through August. Monthly shell lengths ranged from 1.5 to 6.1 mm for *hihīwai* from 'Īao Stream and 2.2 to 9.1 mm in Honomanū Stream (Fig. 6). Due to the intermittent nature of both streams, successful migration was restricted to the estuary. Most *hihīwai* will not survive beyond the estuary because of dry stream beds and the lack of consistent stream flow.



Figure 2. 'Āao Stream mouth collection site (groundwater-maintaining freshwater habitat).



Figure 3. Honomanū Stream collection site. *Hihīwai* moved upstream during large swells and high tides.





Figure 4. *Hihīwai* recruits (<8 mm shell length) attached to the bottom of a rock.

Size classes were compared annually for 'Īao and Honomanū Streams (Figs. 7, 8). Most (93%) of the *hihīwai* measured 5 mm shell length or less and are mostly represented in the first two size classes. Increased survival and limited growth was found in Honomanū Stream.

Total rainfall for January to March was correlated with maximum *hihīwai* counts in 'Īao Stream later in the year ( $R^2 = 0.9289$ ). Total *hihīwai* counts for July to September were plotted with mean monthly rainfall for January to March (Fig. 9). The increased rainfall at the beginning of each year results in increased larvae transported to the ocean. Juvenile *hihīwai* return to stream mouths after several months of development and are reflected in the July to September counts for 'Īao and Honomanū Streams.

Salinity in the 'Īao estuary ranged from 0–2 ppt up to 14–28 ppt near the ocean during times of large incoming swells and high tides.

## Discussion

### Amphidromy and Stream Flow

Maciolek (1978) and Ford (1979) discussed the amphidromous life cycle that involves an obligatory period of larval development in the sea. Similar to fish larvae, there appears to be a limited window of opportunity for *hihīwai* larvae to reach saltwater. Veligers held in fresh water died within six days (Ford, 1979). *Hihīwai* larvae were found to occur twice a year in drift collections in Palauhulu Stream in Ke'anae (Hau *et al.*, 1992), about 2.3 km east of Honomanū Stream. *Hihīwai* larvae was present three to five months prior to juvenile recruitment upstream (Unpublished).

The first major stream flow often triggers reproduction and the release of larvae for development in the ocean (Maciolek, 1978; Ford, 1979). During low flow conditions, *hihīwai* populations are often found in pool and run areas. The first major freshet after a period of low flow often causes a sudden decrease in water temperature and an increase in dissolved oxygen. This scouring flow

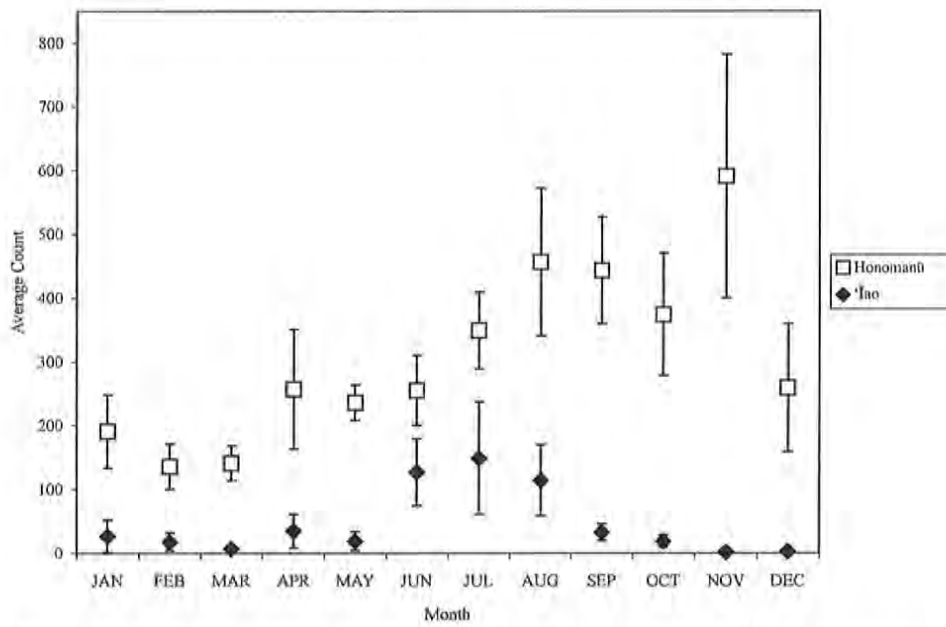


Figure 5. Monthly average counts for *hihivai* in 'Iao (1999–2004) and Honomanu (2001–2004) Streams.

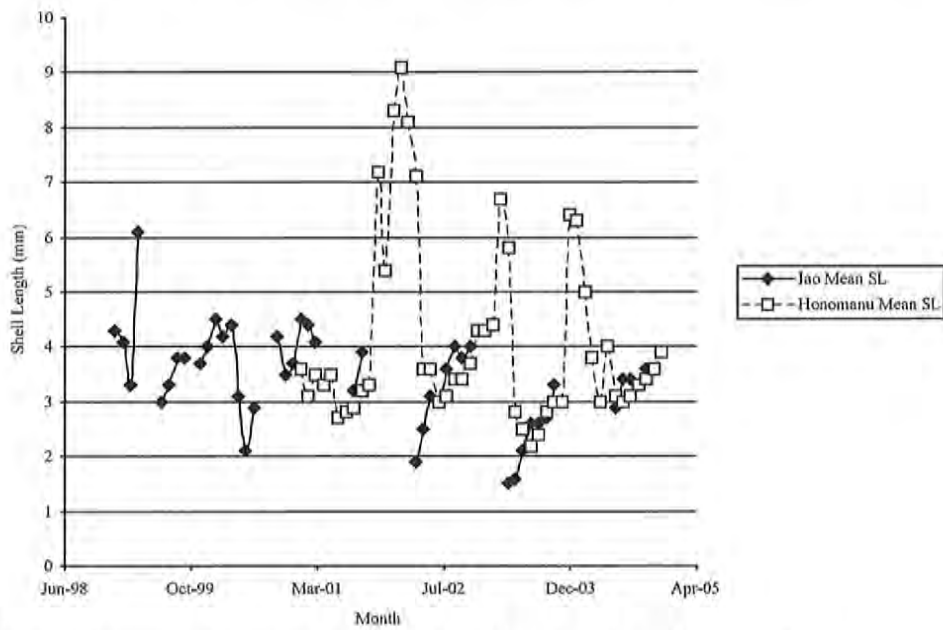


Figure 6. Comparison of mean monthly shell lengths of *hihivai* from 'Iao and Honomanu Streams.

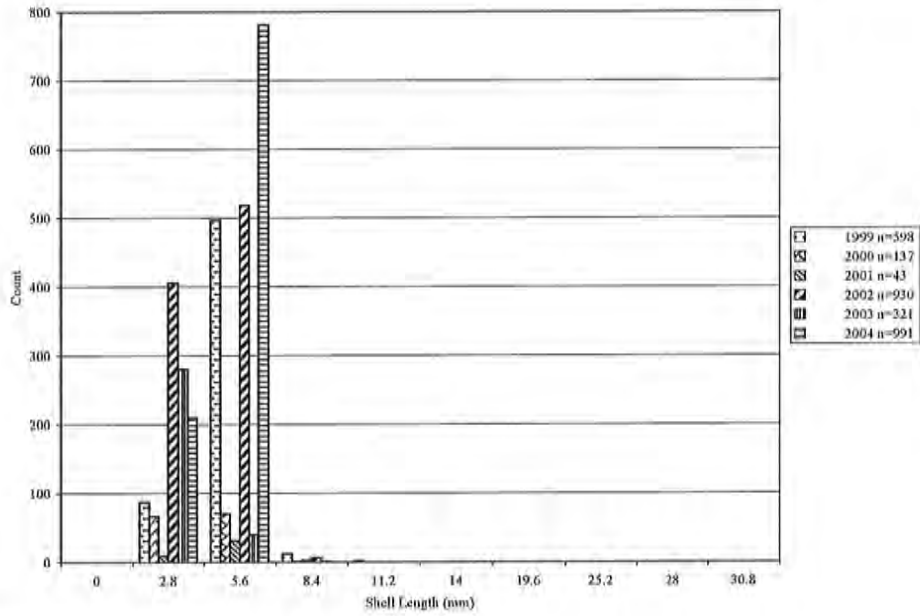


Figure 7. *Hihīwai* size classes for 'Āao Stream (1999 to 2004).

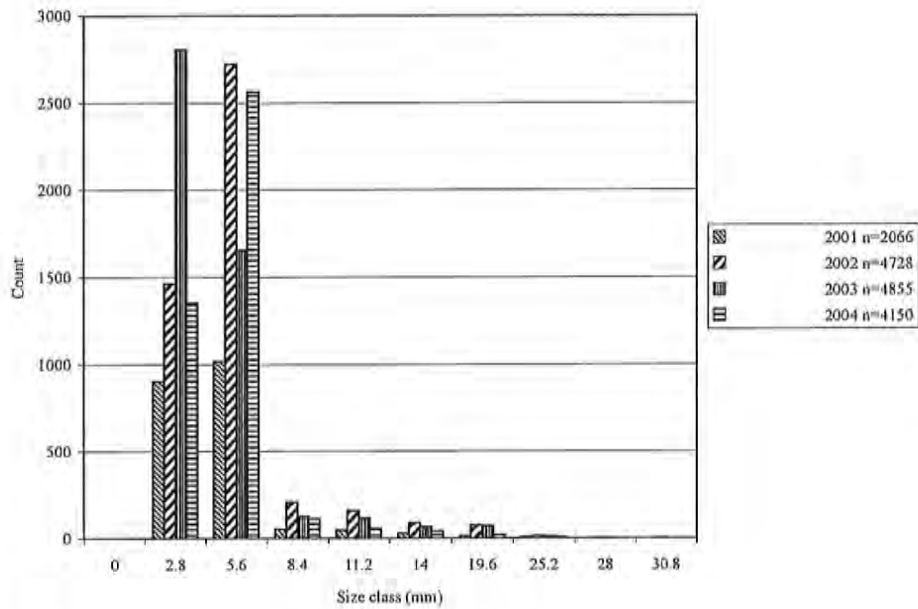


Figure 8. *Hihīwai* size classes for Honomanū Stream (2001 to 2004).

provides optimum conditions for *hīhīwai* egg cases to be laid on hard substrate and the transport of hatched larvae to the ocean as quickly as possible.

The streams occasionally experience heavy rains and flash flooding which temporarily establishes the *mauka-makai* connection (from the mountain to the ocean) that is vitally important for amphidromous animals migrating between the ocean and fresh water. The connection is maintained intermittently after storms with flows that exceed diversion capacities. Many papers have documented post larval migration of hinana or juvenile fishes (Gobiidae) and 'ōpae or shrimp (*Atyoida bisulcata*) in response to increased flow (Lindstrom & Brown, 1994; Nishimoto & Kuamo'o, 1997; Tate, 1997).

*Hīhīwai* still attempt to migrate into 'Īao and Honomanū estuaries even though both streams have been diverted for more than 100 years. Water collected by diversions is transported to agricultural lands by a comprehensive system of irrigation ditches and reservoirs (Wilcox, 1996). These diversions may also be carrying *hīhīwai* larvae away from the ocean.

Dewatering can inhibit upstream migration of postlarvae, which are critical to the life cycles of many native species (Brasher, 2003). The removal of water through diversions (Fig. 10) reduces stream discharge, lowers flow velocity, decreases water depth, and increases water temperature. The amount of run, riffle, and pool habitats are reduced for stream organisms like *hīhīwai*. An insect study in Kīnihapai Stream (tributary of 'Īao Stream) suggest that torrential flows are a factor regulating habitat availability for *Telmatogeton torrenticola* and the reduced discharge could significantly reduce the amount of useable habitat for this and other stream fauna (Benbow *et al.*, 1996).

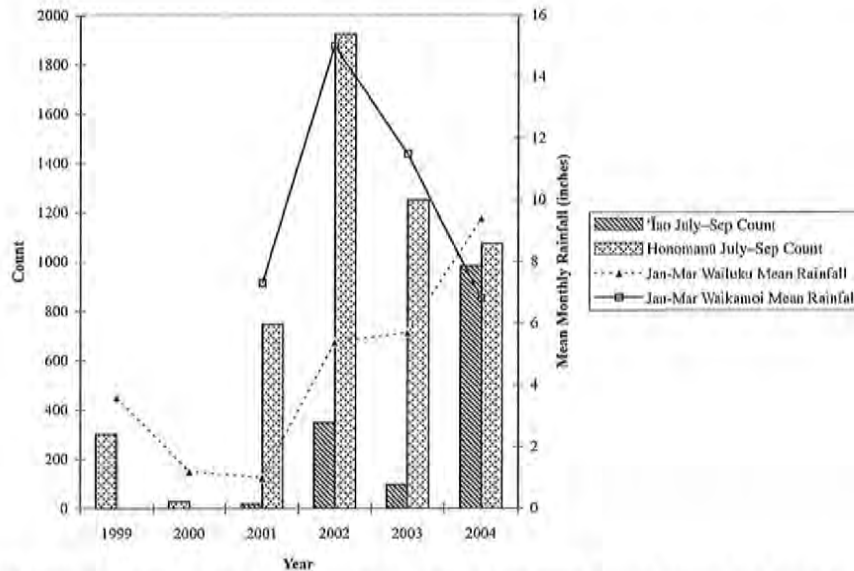
For diverted streams, the requirement for two or more flows are often overlooked and are needed to allow post larvae *hīhīwai* and other stream animals sufficient space and time to migrate upstream. Depending on the duration of the rainy season, these later flows may need to exceed diversion capacities and be able to break open a natural berm built up by large winter swells (>10 m) generated from the North Pacific. Substrate, which naturally moves downstream, blocks the stream from flowing into the ocean. On the other hand, with consistent rainfall, there is sufficient flow to prevent this build up and a continuous stream connection to the ocean is maintained.

The maintenance of median flow with prolonged periods of elevated discharge has been shown to be important for successful reproduction of 'o'opu *alamo'o* (*Lentipes concolor*) (Way *et al.*, 1998). The diversion of Waikolu Stream on the island of Moloka'i dampened the natural seasonal discharge cycle, exacerbated natural low flow conditions, and increased the likelihood of prolonged periods of extremely low flow. Although 'o'opu *alamo'o* appears to be capable of reproducing throughout the year, the species' gonadal activity is correlated with monthly periods of high water flow. Fish from Waikolu Stream had a 'boom or bust' reproductive pattern, and the population had reduced or no reproduction when stream flow conditions reached extreme low levels (Way *et al.*, 1998).

### Groundwater

At both study sites, springs and groundwater becomes much more important in maintaining the freshwater stream habitat near the shore. *Hīhīwai* juveniles and adults are restricted to fresh waters and not found in brackish water environments (Ford, 1979). During November 1975, the population of neritids in the lower 90-m reach of Waiohue Stream on Maui was subjected to seawater inundation during periods of extremely high surf (Ford, 1979). The influence of large ocean swells and seasonal high tides reaching the estuary can increase salinity and cause *hīhīwai* to migrate upstream, away from brackish water. There could be an unknown mortality of juvenile *hīhīwai* caused by increased salinity. Depending on tides, *hīhīwai* was often the only snail migrating upstream while *hapawai* (*Neritina vespertina*) and *pipivai* (*Theodoxus cariosus*) remained in the estuary (Maciolek, 1978; Titcomb, 1978). *Hīhīwai* was periodically absent at the mouth but located more than 50–75 m upstream in the 'Īao and Honomanū estuaries.

Groundwater emerging from several springs in the Honomanū basalt near the shoreline is estimated to be 1.4 mgd (2.2 cfs) of flow (Gingerich, 1999). The Honomanū estuary is much larger and covers over 200 m in length, over 10 m in width, and a maximum depth of 2 m. This larger area of stable aquatic habitat results in significantly higher *hīhīwai* counts and allows recruits to grow to larger sizes (>20 mm).



**Figure 9.** Total *hihivai* counts (July to September) in 'Āao and Honomanū Streams plotted with mean monthly rainfall (January to March).

Flow is reduced in 'Āao Stream from water tunnels and diversions. Lower 'Āao Stream often lacks stream flow (Yamamoto & Tagawa, 2000). 'Āao Stream is subject to prolonged dry periods, which reduces the amount of aquatic habitat to less than 100 m<sup>2</sup>, and water depths are often less than 0.3 m. During rainy periods, the 'Āao estuary can be greater than 100 m in length, more than 20 m in width, and about 0.5 m in depth. The concrete channel and flood control modifications help to shunt stream flow directly to the ocean resulting in shallow runs, riffles, and pools.

From July 1993 to June 2003, 'Āao Stream discharge averaged 59.9 cfs (38.7 mgd) (U.S. Geological Survey Water-Data 'Āao Stream Gauge No. 16604500). Based on water declarations, estimated stream flow was reduced from 80% in FY1993 to 96% in FY2003. The Spreckels Ditch, Kama Ditch, and 'Āao Valley intakes were identified as major diversions. Together with private declarations a total of 129.6 cfs (83 mgd) were reported (Tagomori, 1991). Total water declarations exceed actual stream flow by more than two times.

#### Upstream Migration

The upstream movement of *hihivai* appears to be influenced by several factors. In general, there is limited upstream movement in diverted streams because of intermittent stream flows. Similar to migrating *hinana* and 'ōpae, *hihivai* will die after being stranded when flow stops and the streams dry.

Migration lines appear to be an efficient way to move en masse during times of increasing stream flow. The tendency of *hihivai* to aggregate and form lines and mucus trails was observed in both 'Āao and Honomanū Streams. After a passing storm on 13 April 2004, I encountered snails starting to form lines (up to 7.5 cm) at the Honomanū Stream mouth. I also found several migrating *hihivai* carrying smaller ones. Small one-mm *hihivai* were found on larger ones with shells between 2 to 5 mm. This "hitchhiking" behavior was also reported for *Cochliopina tryoniana* migrating with *Neritina latissima* in the Rio Claro in Costa Rica (Schneider & Lyons, 1993); smaller *C. tryoniana* sometimes attached to larger *N. latissima*.

Longer migration lines appear in runs and riffles further upstream. On 8 May 2004, after heavy



**Figure 10.** 'Īao Stream Diversion (below USGS Stream Gauge No. 16604500). Most stream flow is diverted into irrigation ditches.

rains, I found *hihīwai* traveling along trails up to 60 cm long on the rocky streambed that is normally dry below the Honomanū highway bridge. A total of 315 *hihīwai* measured from 2.3–5.9 mm and averaged 3.4 mm shell length (S.E. = 0.03). The mucus trail appears to reduce friction and “grease” the way for other *hihīwai* to follow. These trails seem to reduce time spent in exploring other directions. As flow decreases in certain habitat conditions, some *hihīwai* appear to independently stop migrating.

Dry streambeds, concrete channels, or multiple diversions impede and prevent upstream migration of *hihīwai* beyond the estuary. During July 1991, Hodges (1992) found *hihīwai* in wet gravel under large cobbles and boulders in the middle of the dry intermittent Honomanū streambed. On one occasion, he observed tens of thousands of young *hihīwai* (up to 10 mm shell length) in a migrating column over a meter and downstream for 500 m. It appears this observation was during an exceptional rainy period with continuous stream flow that allowed *hihīwai* to migrate upstream. When stream flow stops, similar to drought conditions, *hihīwai* are forced initially into standing pools that eventually dries leaving moist areas under boulders and wet gravel.

In Pua'alu'u Stream, snails did not occur above 185 m in windward East Maui (Ford, 1979). The diversion at 390 m significantly restricted *hihīwai* to a short reach immediately above the head of the estuary (Ford, 1979). This same condition exists for 'Īao and Honomanū Streams. On Maui, *hihīwai* was recorded at 140 m in continuous 'Alelele Stream (Division of Aquatic Resources Surveys September 1994).

The majority of migrating *hihīwai* found in 'Īao and Honomanū Streams are less than five mm shell length. When present, *hihīwai* from 'Īao Stream appears to be represented by two size classes with few growing larger than 5 mm. The 'Īao estuary has been impacted by droughts at various times of the year. Honomanū Stream appears to be a better nursery with significantly more *hihīwai* growing to larger size classes. The increased groundwater helps to insure a stable freshwater environment.

Water recharge estimates in the 'Īao watershed have continued to decrease with the loss of agriculture (Meyer & Presley, 2001). More water recharge is necessary to sustain healthy groundwater flow. Water diversion projects have had enormous impacts on streams after the degrading of Hawaiian forests and the introduction of grazing animals. Perennial streams became intermittent and springs dried up (Wilcox, 1996). In the Wailuku watershed, increasing development and changes in land use activities including urbanization have increased impervious surfaces and drainage runoff.

'Īao and Honomanū Streams represent many other streams in Hawai'i that have been diverted. Restricted stream flows have resulted in smaller estuaries and prevented *hīhīwai* from migrating to higher elevations. Unless the animals reach adequate freshwater stream habitats, they are unable to grow into healthy reproducing populations. In Honomanū and 'Īao Streams, the diversion of over 90% of the stream flow results in intermittent stream conditions, which limit the average growth of *hīhīwai* to less than 10 mm. The recruitment of *hīhīwai* and other amphidromous species requires consistent stream flows.

Groundwater plays a very important role in maintaining freshwater stream habitats near the ocean. Similar to *Neritina punctulata* in Puerto Rico which requires estuary connections for larval development (Pyron & Covich, 2003), the connections between the estuary and upstream reaches need to be maintained to avoid local extinctions of *hīhīwai*. The persistence of *hīhīwai* recruitment confirms the possibility for restoring native stream populations if "natural flow" is restored. Stream restoration should be based on the needs of the slowest migrating animal such as *hīhīwai*. A slow-migrating species like *hīhīwai* may be a good indicator of the adequacy of stream flow during stream restoration programs. Future attention should be focused on the flow requirements for sustaining reproducing populations of *hīhīwai* and other amphidromous species and not just on their mere presence. Native stream animals need successful spawning, larval development, and recruitment for each island (Radtke *et al.*, 2001).

#### Acknowledgments

Many thanks to Isabella A. Abbott, Darrell G.K. Kuamo'o, Robert T. Nishimoto, Glenn R. Higashi, Wesley Hau, Lori L. Ohta, Norman Yoshioka, Matt Wong, Stephen B. Gingerich, Richard Fontaine, J. Michael Fitzsimons, David Higa, Neal D. Fujii, and Alison Sherwood who provided assistance, support, and kind words of encouragement. Special thanks to Ivor D. Williams & Thierry M. Work who reviewed my raw data and offered helpful comments. Thanks also to Luis E. Menoyo (USGS) for getting copies of their excellent maps showing my study sites. I especially wish to recognize two *kupuna*, Sarah Ka'aaumo and Luther Kanae, Sr., who shared their stories and observations from earlier times before their passing.

#### Literature cited

- Benbow, M.E., A. J. Burky & C.M. Way. 1996. Habitat specificity of the endemic Hawaiian midge, *Telmatogeton torrenticola* (Telmatogetoninae). *Bulletin of the North American Benthological Society* 13: 136–137.
- Brasher, A.M. 2003. Impacts of human disturbances on biotic communities in Hawaiian streams. *BioScience* 53: 1052–1060.
- Ford, J.I. 1979. Biology of a Hawaiian fluvial gastropod *Neritina granosa* Sowerby (Prosobranchia: Neritidae). M.S. Thesis, University of Hawaii, Honolulu, Hawaii: 94 p.
- Gingerich, S.B. 1999. Ground-water occurrence and contribution to streamflow, Northeast Maui, Hawaii. *United States Geological Survey Water-Resources Investigations Report* 99-4090. 69p.
- Hau, S., C.M. Way & A.J. Burky. 1992. Life cycle of the endemic limpet *Neritina granosa* (Sowerby). in *Palauhulu Stream, Maui*. 43rd Annual Meeting of American Institute of Biological Sciences. Ecological Society of America, 9–13 August, Honolulu, Hawaii (abstract).

- Hodges, M.H.-D. 1992. Population biology and genetics of the endemic Hawaiian stream gastropod *Neritina granosa* (Prosobranchia: Neritidae): implications for conservation. Honors Thesis, Wildlife Biology Program University of Montana, Missoula, Montana, July 1992.
- Lindstrom, D.P. & C.L. Brown. 1994. Early development and biology of the amphidromous Hawaiian stream goby *Lentipes concolor*. *Proceedings of the Fourth Indo-Pacific Fish Conference, Systematics and Evolution of Indo-Pacific Fishes*, 28 November–4 December, 1993, Bangkok, Thailand, p. 397–409.
- Maciolek, J.A. 1978. Shell character and habitat of nonmarine Hawaiian neritid snails. *Micronesica* 14: 209–214.
- Meyer, W. & T.K. Presley. 2001. The response of the 'Īao Aquifer to ground-water development, rainfall, and land-use practices between 1940 and 1998, Island of Maui, Hawaii: *United States Geological Survey Water-Resources Investigations Report 00-4223*, 60 p.
- Nishimoto, R.T. & D.G.K. Kuamo'o. 1997. Recruitment of goby postlarvae into Hakalau stream, Hawaii Island. *Micronesica* 30:41–49.
- Pyron, M. & A.P. Covich. 2003. Migration patterns, densities, and growth of *Neritina punctulata* snails in Rio Espíritu Santo and Rio Mameyes, Northeastern Puerto Rico, *Caribbean Journal of Science* 39: 338–347.
- Radtke, R.L., R.A. Kinzie III & D.J. Shafer. 2001. Temporal and spatial variation in length of larval life and size at settlement of the Hawaiian amphidromous goby *Lentipes concolor*. *Journal of Fish Biology* 59: 928–938.
- Schneider, D.W. & J. Lyons. 1993. Dynamics of upstream migration in two species of tropical freshwater snails. *Journal of the North American Benthological Society* 12: 3–16.
- Tagomori, M. 1991. Division of Water Resource Management. [Letter to Mr. Henry Sakuda, Administrator, Division of Aquatic Resources. January 29, 1991.]
- Tate, D.C. 1997. The role of behavioral interactions of immature Hawaiian stream fishes (Pisces: Gobiodei) in population dispersal and distribution. *Micronesica* 30: 51–70.
- Titcomb, M. 1978. Native use of marine invertebrates in old Hawaii. *Pacific Science* 32: 325–375.
- Way, C.M., A.J. Burky, J.M. Harding, S. Hau & W.K.L.C. Puleloa. 1998. Reproductive biology of the endemic goby, *Lentipes concolor*, from Makamaka'ole Stream, Maui and Waikolu Stream, Moloka'i. *Environmental Biology of Fishes* 51: 53–65.
- Wilcox, C. 1996. *Sugar water: Hawaii's plantation ditches*. University of Hawai'i Press, Honolulu, Hawaii. 191 p.
- Yamamoto, M.N. & A.W. Tagawa. 2000. *Hawai'i's native and exotic freshwater animals*. Mutual Publishing, Honolulu. 200 p.





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# Instream Flow Standard Assessment Report

## Island of Maui

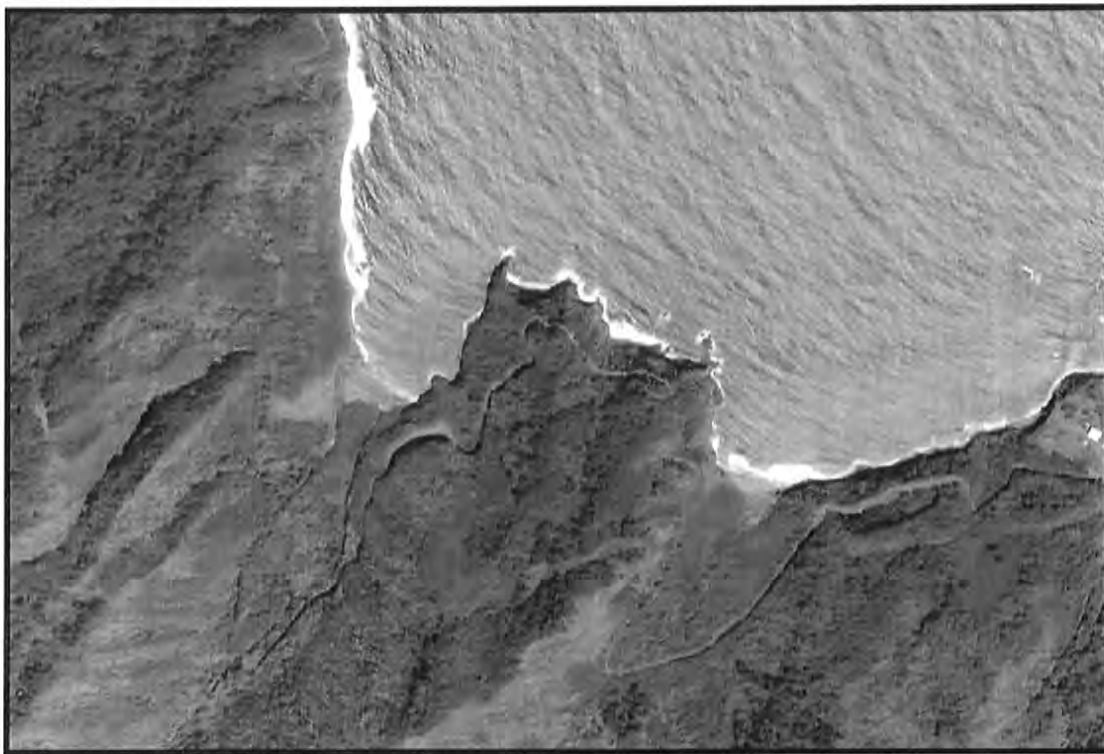
### Hydrologic Unit 6051

# Honomanu

December 2009

PR-2009-05

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**State of Hawaii**  
Department of Land and Natural Resources  
Commission on Water Resource Management



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**EXHIBIT** E-63

Figure 5-2. Recreational points of interest for Honomanu hydrologic unit (Source: State of Hawaii, Office of Planning, 1999, 2002a; 2002c; 2002d; 2004a; USGS, 2001b).

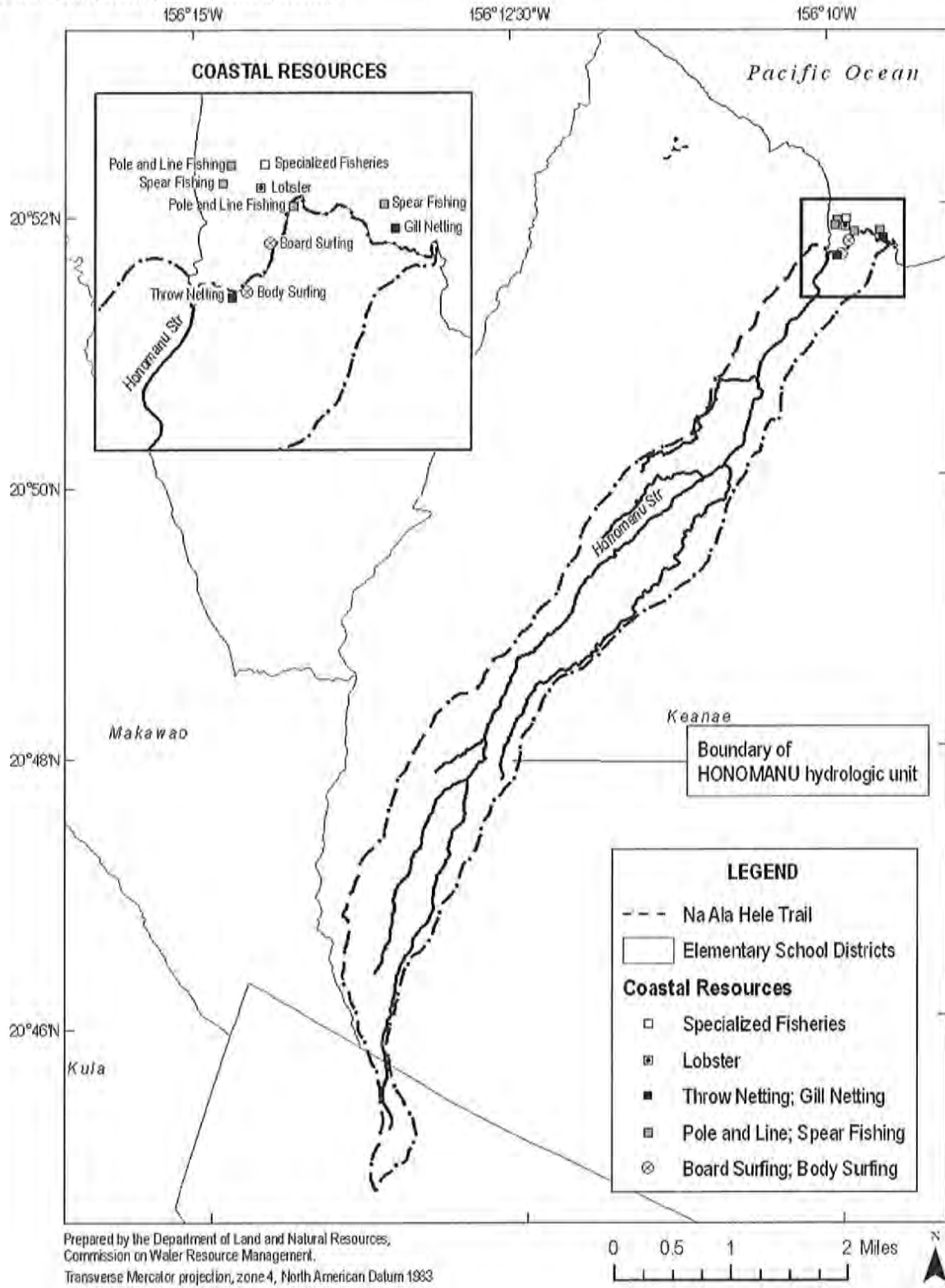


Table 13-10. Summary of A&B's agribusiness revenues for 2000 to 2008 (Source: A&B, 2002; 2005; 2007; 2009).

Year	Revenue (dollars)	Operating Profit (dollars)	Operating Profit Margin (percent)
2008	\$ 124,300,000	\$(12,900,000)	(10.4)
2007	\$ 123,700,000	\$ 200,000	0.16
2006	\$ 127,400,000	\$ 6,900,000	5.4
2005	\$ 123,200,000	\$ 11,200,000	9.1
2004	\$ 112,800,000	\$ 4,800,000	4.3
2003	\$ 112,900,000	\$ 5,100,000	4.5
2002	\$ 112,700,000	\$ 13,800,000	12.2
2001	\$ 105,976,000	\$ 5,660,000	5.3
2000	\$ 107,510,000	\$ 7,522,000	7.0

The EMI System was originally built for the purpose of supplying water to the HC&S sugarcane plantation. While other entities have become dependent on the EMI System, HC&S continues to be the largest user of the water delivered in the system. Figure 13-18 illustrates the interconnectedness of the different entities (including HC&S) dependent on the EMI System for water, and how this system is linked to the Maui DWS Upcountry System. Listed below are some of the possible economic impacts of limiting water availability to HC&S.

- **Employment.** Restricting water availability to HC&S will result in possible reduction of sugar production and sales, which will affect HC&S' ability to maintain and support its present staff. HC&S provides approximately 800 full-time jobs out of the estimated 1,750 agriculture-related jobs on Maui (Department of Business, Economic Development and Tourism [DBEDT], 2007). The company also currently has 910 retirees (PR-2009-18, 56.0). This amounts to \$47 million annually in wages and benefits to employees and retirees. HC&S has an apprenticeship program that not only maintains a skilled workforce for HC&S, but also provides a training ground for employees that move on to other companies in the public sector (PR-2009-18, 64.0). HC&S also partners with Ka Lima O Maui to provide employment services for individuals with disabilities (PR-2009-18, 66.0). Many companies and the Maui economy benefit from having locally trained employees rather than hiring from out-of-state.
- **Renewable energy.** The loss of hydroelectric and biomass fueled electric generation would affect MECO's ability to comply with its statutory obligation to generate electricity from renewable resources, as well as supply adequate energy to the local residents, especially during black-outs. This will also undermine the State's Clean Energy Initiative (HC&S, 2009).
- **Ground water.** Higher dependence on ground water for irrigation increases pumping costs. In addition, long term use of ground water that has even small amounts of sodium chloride can build up in the soil and affect crop yield. With decreased ground water recharge resulting from limiting surface water resources for irrigation, the wells within the plantation are even more susceptible to increased levels of salinity.
- **Landscape and tourism.** The HC&S plantation makes up a majority of the landscape in central Maui, keeping the island of Maui "green" as emphasized in many of the public review comments. Carol Reimann, Executive Director of the Maui Hotel & Lodging Association, stressed that "Maui's strength as a top tourism destination depends on the ability to showcase the island as a lush, green tropical paradise" (PR-2008-19). She further emphasized that it is lushness of the island that attracts visitors; thus, driving the local economy. The Visitor Industry provides 40 percent of all jobs on the island, generates 75 percent of the County's economy, and contributes about 40 percent of the total Real Property Tax collections (PR-2008-19).
- **Suppliers.** HC&S spends approximately \$100 million annually in the local economy to support its operations, primarily in Maui (HC&S, 2009). Many companies service HC&S; among them

sources are limited, MLP relies more on its ground water sources and DWS agricultural meters for irrigation (J. Pearson, personal communication, October 2009).

Under a License and Water Agreement between MLP and EMI, two “classes” of water are transported via the EMI System. The first class of water, which represents the majority of MLP’s usage, is pumped by Maui Pineapple Co., Ltd. into the Koolau Ditch from Hanawi Stream at Nahiku near the start of the EMI System. The second class of water is what MLP is contractually allowed to withdraw, for a fee, from the EMI System when flow exceeds 100 million gallons per day. MLP estimates their water requirements from the EMI System at 4.5 million gallons per day from 2004 through 2009, and a reduction to approximately 3.1 million gallons per day from 2009 to 2016 (PR-2008-18, 27.0).

**Economic Impact**

According to MLP’s Annual Reports to the U.S. Securities and Exchange Commission, the last year that MLP had an operating profit for their pineapple operations was in 1999. Table 13-11 provides a summary of revenue and operating losses from 1999 to 2006. Some of the revenue losses can be attributed to increased importation of overseas pineapple products (specifically from Thailand); though it appears that the U.S. had begun imposing antidumping duties, as canned pineapple imports had decreased in 2001. Regardless, MLP ceased pineapple canning operations on Maui in June 2007, attributing the closure to increased imports of cheaper canned pineapple. Instead, MLP is choosing to focus on the production of pineapple juice and fresh fruit. The closure of Hawaii’s last canned pineapple producer resulted in the loss of 120 jobs, or 27 percent of the company’s workforce (Hao, 2007).

**Table 13-11.** Summary of MLP’s revenues and operating losses for 1999 to 2006 (Source: MLP, 2002; 2004; 2005; 2007).

[Numbers in parentheses indicate operating losses; numbers not in parentheses are gains.]

Year	Revenue (dollars)	Operating Loss (dollars)
2006	\$ 65,200,000	\$ (18,600,000)
2005	\$ 74,500,000	\$ (11,400,000)
2004	\$ 80,000,000	\$ (10,800,000)
2003	\$ 105,000,000	\$ (921,000)
2002	\$ 92,500,000	\$ (8,500,000)
2001	\$ 92,000,000	\$ (3,000,000)
2000	\$ 85,900,000	\$ (2,900,000)
1999	\$ 94,400,000	\$ 6,100,000

Restricting water availability to MLP by establishing interim IFS on Hanawi Stream, one of the 27 petitioned streams, may add to the company’s continued operating losses. Pumping costs will increase as MLP will need to supplement its irrigation needs with ground water from Kuhiwa and Hailiimaile wells. While MLP will shift all of the plantings to its east Maui field, MLP may need to further decrease the cultivated acreage by more than 43 percent as planned.

**13.4.5 Kula Agricultural Park**

The Kula Agricultural Park consists of 445 acres of land divided into 31 lots that range from 7 to 29 acres in size (Fukunaga and Associates, Inc., 2006). These agricultural lots are leased out to farmers in an effort to promote the development of diversified agriculture. Lease rates are \$100 per acre per year with tenure of the lease being 50 years. Currently, the lots are leased to a total of 26 farmers. The Kula area is known as a prime agricultural area for vegetable and flower farming in Maui (PR-2009-18, 58.0). Crops grown include vegetables (lettuce, tomato, Kula onions, zucchini, cucumbers, bush beans, sweet corn, eggplant, head cabbage, Chinese cabbage, peppers, ginger root), taro, bananas, mango, turf grass, nursery

A statistical analysis (Freedman, 2009) was conducted to examine cost-effective strategies to maintain and even increase the drought period reliable capacity of the Kamole Weir WTF to meet the increasing water demands as well as to mitigate impacts of potential raw water supply reductions. One option is to provide raw water storage reservoir capacity to ensure a reliable supply of water to the Upcountry District in times of drought. The study shows that for less than 30 million gallon reduction in Wailoa Ditch flows, providing a 100 to 200 million gallon reservoir would maintain the existing drought period reliable capacity of the WTF. If Wailoa Ditch flow reductions are more than 30 million gallons, maintaining the drought period reliable capacity using additional basal ground water wells is most cost-effective.

Another option is to modify the existing Kamole Weir WTF intake structures to increase the amount of water that can be withdrawn from Wailoa Ditch during low flow conditions. The study shows that this method is more cost-effective than drilling new basal ground water wells to provide incremental drought period reliable capacity. However, under normal flow conditions, improvements to the intake structure would not appreciably increase the average supply of water to the Upcountry District.

The economic impacts to Maui DWS can be expressed in costs estimates for implementing the recommended strategies proposed in Freedman (2009). One of the drawbacks of providing raw water storage reservoir capacity is the large initial capital expenditures in reservoir construction. The study estimates an expenditure of \$15 to 30 million in building a 100 million gallon reservoir, and \$30 to 60 million for a 200 million gallon reservoir. The cost of providing new basal ground water wells to replace the existing drought period reliable capacity of 4.5 million gallons per day would be about \$32 million, or \$8 million for every 1 million gallons per day of additional Kamole Weir WTF's drought period reliable capacity. While specific plans to improve the WTF intake structures have not been examined, it can be assumed that these improvements would be more cost-effective than drilling basal wells.

### **13.5 County of Maui, Department of Water Supply Upcountry System**

There are three Upcountry Maui DWS water systems served by east Maui streams: 1) Upper Kula system is served by Haipuaena, Waikamoi, and Puohokamoa Streams; 2) Lower Kula system is served by Honomanu, Haipuaena, and Waikamoi Streams; and 3) Makawao system, as previously discussed, is served by EMI's Wailoa Ditch. Maui DWS diverts the streams for the Upper and Lower Kula pipelines, and it is only the Makawao system whose source is the EMI System. Although the Makawao system has already been discussed in a previous section (Section 13.4.6), this section will include an in-depth discussion on the Maui DWS Upcountry System in its entirety, including the Makawao system, and present some of the data that can be used to compare water use in different Upcountry regions.

#### **13.5.1 System Overview**

The Maui DWS Upcountry Water District, illustrated as colored regions in Figure 13-12, includes the sub-districts of Upper and Lower Kula, Opana/Awalau, Kula Agricultural Park, Makawao-Pukalani, and Haiku-Kokomo (Maui DWS, 2009), with an estimated population of 30,981 people (Findings of Fact, Conclusions of Law, and Decision and Order, 2007). The Opana/Awalau and Kula Agricultural Park sub-divisions receive non-potable water while the rest of the sub-districts receive potable water. The potable water systems are supported by three water treatment facilities, Olinda WTF, Piiholo WTF, and Kamole Weir WTF.

The Upper Kula system is situated at the highest elevation (about 4,200 feet) of the three systems comprising the Maui DWS Upcountry System. It begins as a flume (also known as the Waikamoi Upper Flume), capturing surface water from Haipuaena Stream, middle and west branch of Puohokamoa Stream, and Waikamoi Stream. The flume is connected to a 36-inch transmission line at Waikamoi and then

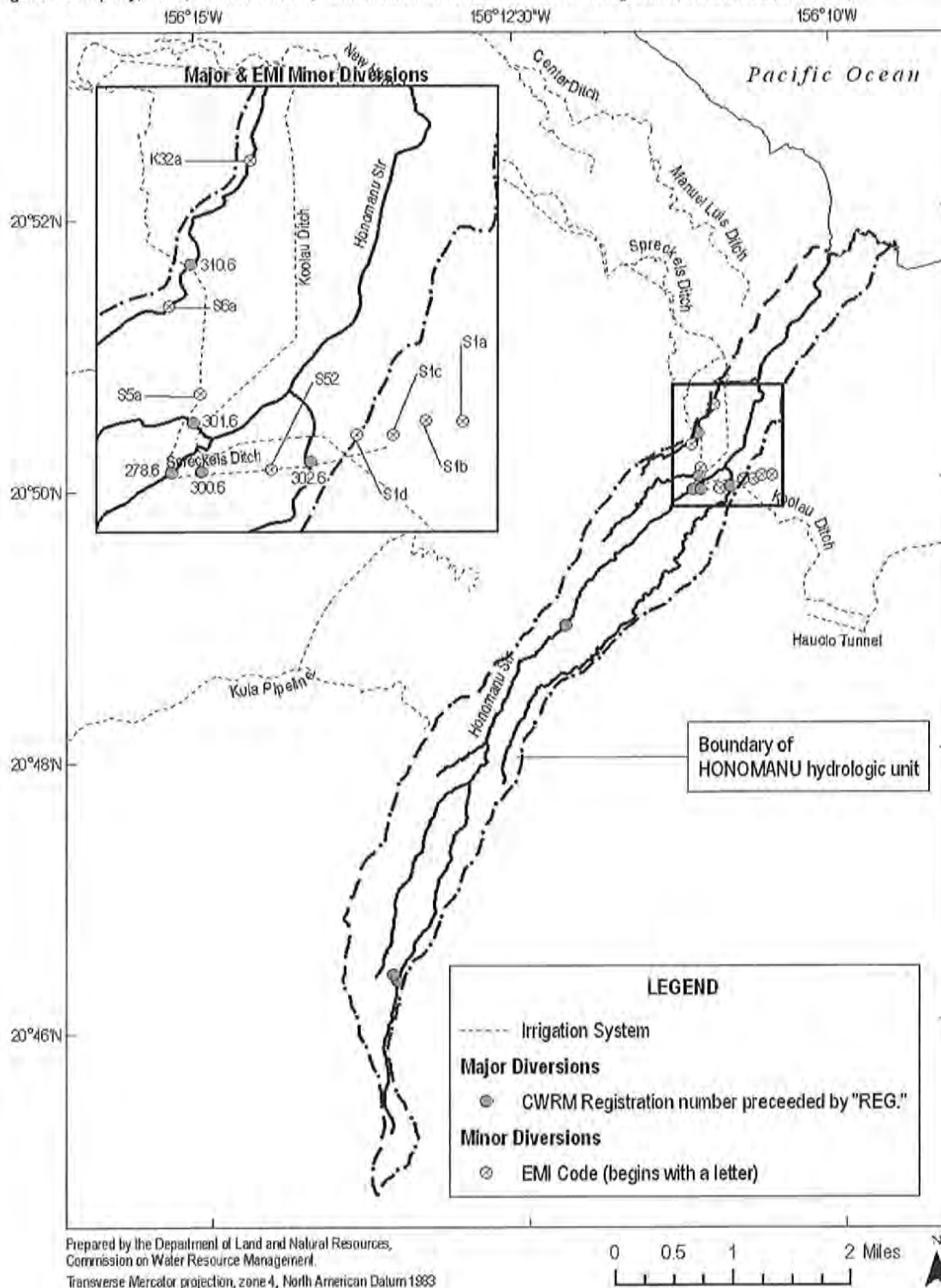
captures additional water from Kailua Stream. The transmission line passes through the Waikamoi Reservoirs (two 15 million gallons reservoirs) and the Kahakapao Reservoirs (two 50 million gallons reservoirs) before reaching the Olinda WTF.

The Lower Kula system (also known as the Waikamoi Lower Pipeline) is situated at the 2,900 feet altitude and captures surface water primarily from Honomanu Stream, Haipuaena Stream, all branches of Puohokamoa Stream, and the east and west branch of Waikamoi Stream. Water from this system is treated at the Piihola WTF and provides for domestic and agricultural uses in the Lower Kula region. Other than the 50 million gallon reservoir at the WTF, there are no other major reservoirs along the Lower Kula System.

The Makawao system is served by EMI's Wailoa Ditch that runs at approximately 1,100 feet elevation, and draws water from east Maui streams as far as Makapipi. Maui DWS treats the water at the Kamole Weir WTF and provides for domestic use in the Hailiimaile, Makawao, and Pukalani regions. It also serves as backup for the Haiku region in the event of pump failures or repairs and maintenance. During times of drought, water from this facility is pumped to the upper elevations to serve the Lower and Upper Kula regions (Maui DWS, 2009). Section 13.4.6 has more information on the Maui DWS Makawao system.

These three potable Upcountry systems are interconnected and rely on each other for backup during maintenance and repair. Surface water may also supplement the primary ground water sources (Haiku and Kaupakalua wells) for the region, but serves as backup in the event of pump failure or drought (Maui DWS, 2009). During drought conditions or times with lower than normal streamflow, water from the lower systems is frequently pumped to supplement the upper systems. Conversely, water from the upper systems may also be made available to supplement the lower systems during periods of higher than normal rainfall.

Figure 13-19. All registered diversions and EMI minor diversions identified in the Honomanu hydrologic unit (Source: East Maui Irrigation Company, 1970; State of Hawaii, Commission on Water Resource Management, 2008f; USGS, 2001b).





**Table 13-2.** Minor diversions on the EMI System in the Honomanu hydrologic unit.

Diversion ID	EMI Ditch System	Description
K-32a	Koolau	Uluini Stream diversion to Kolea Stream.

**Photos.** a) View of the diversion structure (EMI, 05/1989).



S-1d Spreckels West Nuuaailua small ditch intake.

**Photos.** a) View of the diversion intake structure (EMI, 05/1989); Close-up view of the diversion intake pipe.



**Table 13-2.** Continued. Minor diversions on the EMI System in the Honomanu hydrologic unit.

Diversion ID	EMI Ditch System	Description
S-2a	Spreckels	East Honomanu 2-inch driscoe pipe intake.

**Photos.** a) Concrete catch basin captures seepage and conveys water to Spreckels Ditch via a 2-in. driscoe pipe (EMI, 05/1989); Another view of diversion intake (RMT, 10/2007).

a)



b)



S-5a Spreckels West Honomanu 2-inch pvc pipe intake.

**Photos.** a) Concrete catch basin captures seepage and conveys water to Spreckels Ditch via a 2-in. PVC pipe (EMI, 05/1989).

a)



**Table 13-2.** Continued. Minor diversions on the EMI System in the Honomanu hydrologic unit.

Diversion ID	EMI Ditch System	Description
S-6a	Spreckels	Uluini 2-inch driscoe and pvc pipe intake diversion to Uluini intake.

**Photos.** a) Concrete catch basin captures seepage and conveys water to Koolau Ditch via a 2-in. driscoe and PVC pipe (EMI, 05/1989); Close-up view of the concrete impoundment (RMT, 10/2007).

a)



b)

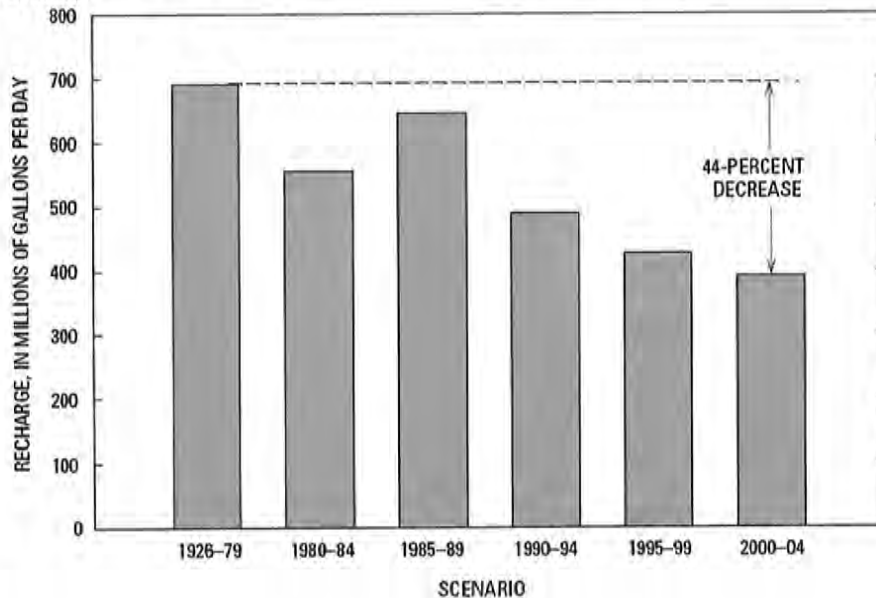


### 13.2 Ground Water Recharge

Following the establishment of instream flow standards, one of the proposed measures to increase streamflow may be to decrease the amount of water diverted from streams. Such a measure has important implications to ground water recharge because it affects the amount of water available for irrigation. Decreasing the amount of water diverted at the ditches located in east Maui affects the amount of water available for the irrigation of crops in west and central Maui. Since the early 20th century, about 100 billion gallons of water (274 million gallons per day) have been diverted each year from Maui streams for irrigation in west and central Maui. More than half of this diverted water, 59 billion gallons per year (162 million gallons per day), comes from east Maui (Engott and Vana, 2007).

The effects of irrigation water on ground water recharge can be analyzed using the water budget equation<sup>20</sup>. Engott and Vana (2007) at the USGS conducted a study that estimated each of the water budget components for west and central Maui using data from 1926 to 2004. Components of the water budget include rainfall, fog drip, irrigation, runoff, evapotranspiration, and recharge. Results of the study were separated into six historical periods: 1926-79, 1980-84, 1985-89, 1990-94, 1995-99, and 2000-04. From 1979 to 2004, ground water recharge decreased 44 percent from 693 million gallons per day to 391 million gallons per day (Figure 13-1). The low recharge rate in 2004 coincides with the lowest irrigation and rainfall rates that were 46 percent and 11 percent lower than those in 1979, respectively. During this period, agricultural lands decreased 21 percent from 112,657 acres in 1979 to 88,847 acres in 2004. Further analysis revealed that a 20 percent decrease in irrigation rate could result in a 9 percent reduction in recharge. A similar study by Izuka et al. (2005) reported that a 34 percent decrease in irrigation rate constituted a 7 percent reduction in recharge in the Lihue basin in Kauai, Hawaii. Since over half of the irrigation water for central Maui comes from east Maui, a 20 percent decrease in the amount of water diverted from streams in the east can potentially reduce recharge in central Maui by 5 percent.

**Figure 13-1.** Estimated recharge for six historical periods between 1926 and 2004, central and west Maui, Hawaii (Source: Engott and Vana, 2007).

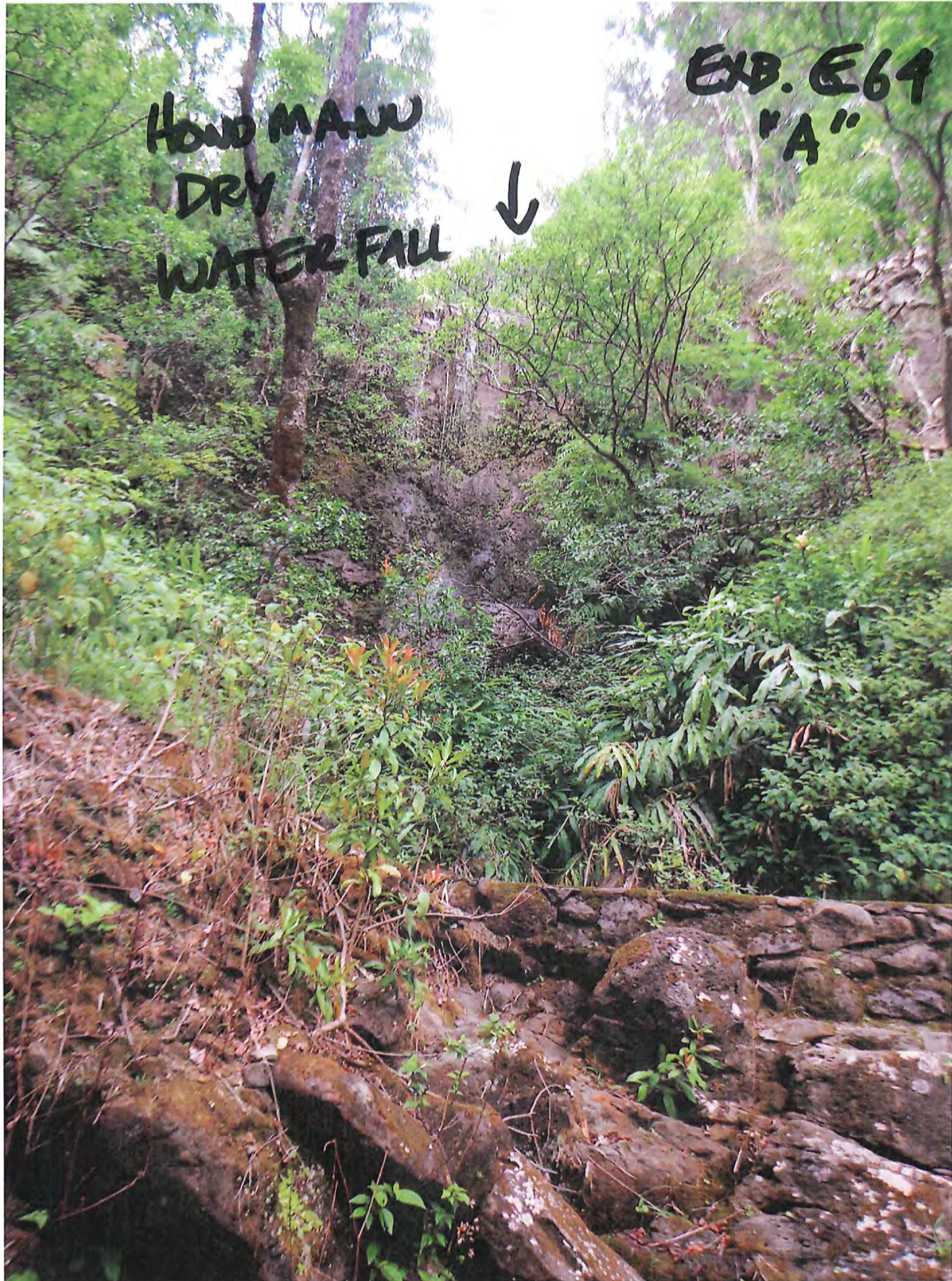


<sup>20</sup> Water-budget is a balance between the amount of water leaving, entering, and being stored in the plant-soil system. The water budget method/equation is often used to estimate ground water recharge.

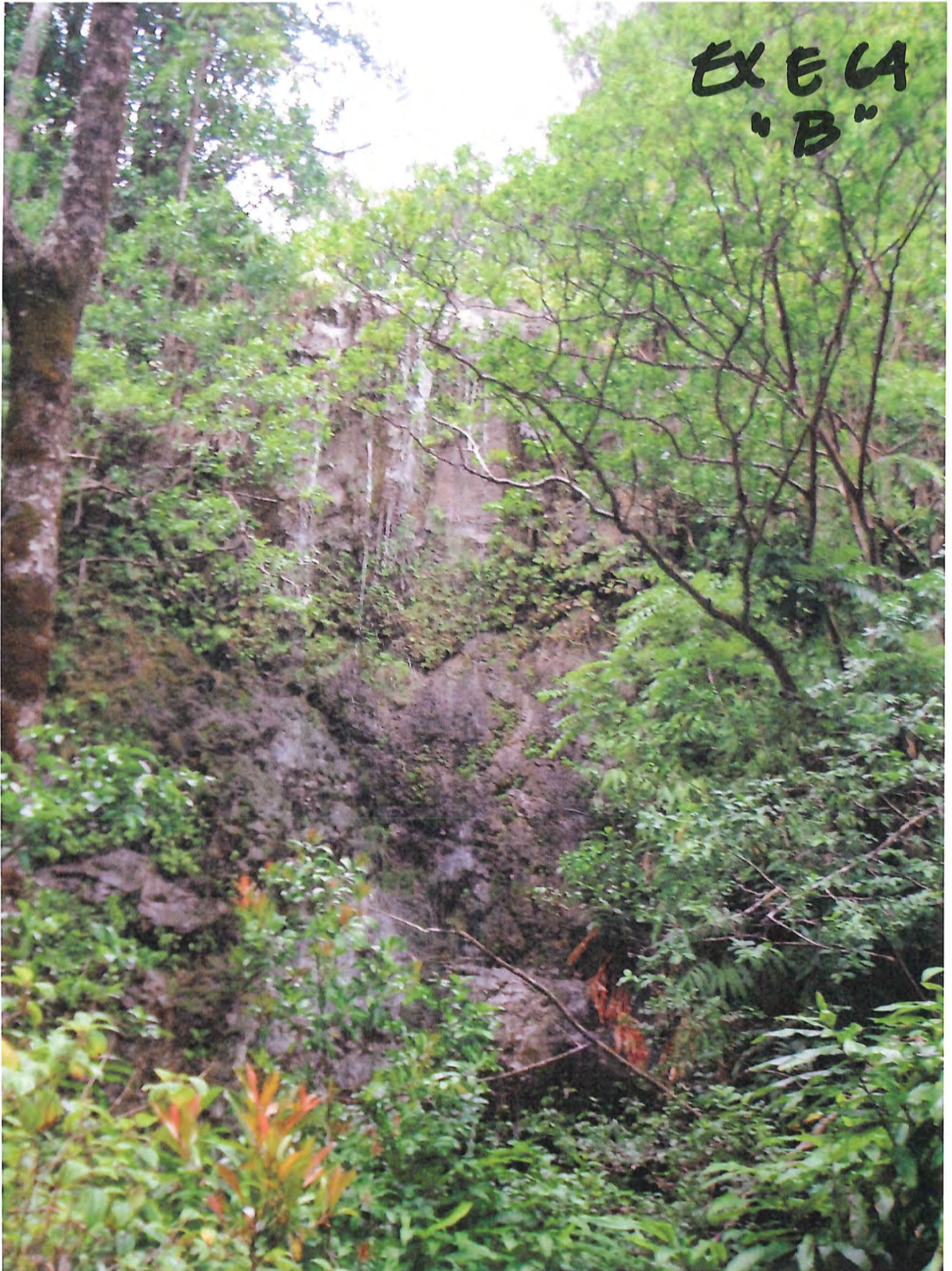
HOW MANY  
DRY  
WATER FALL



EXP. E64  
"A"

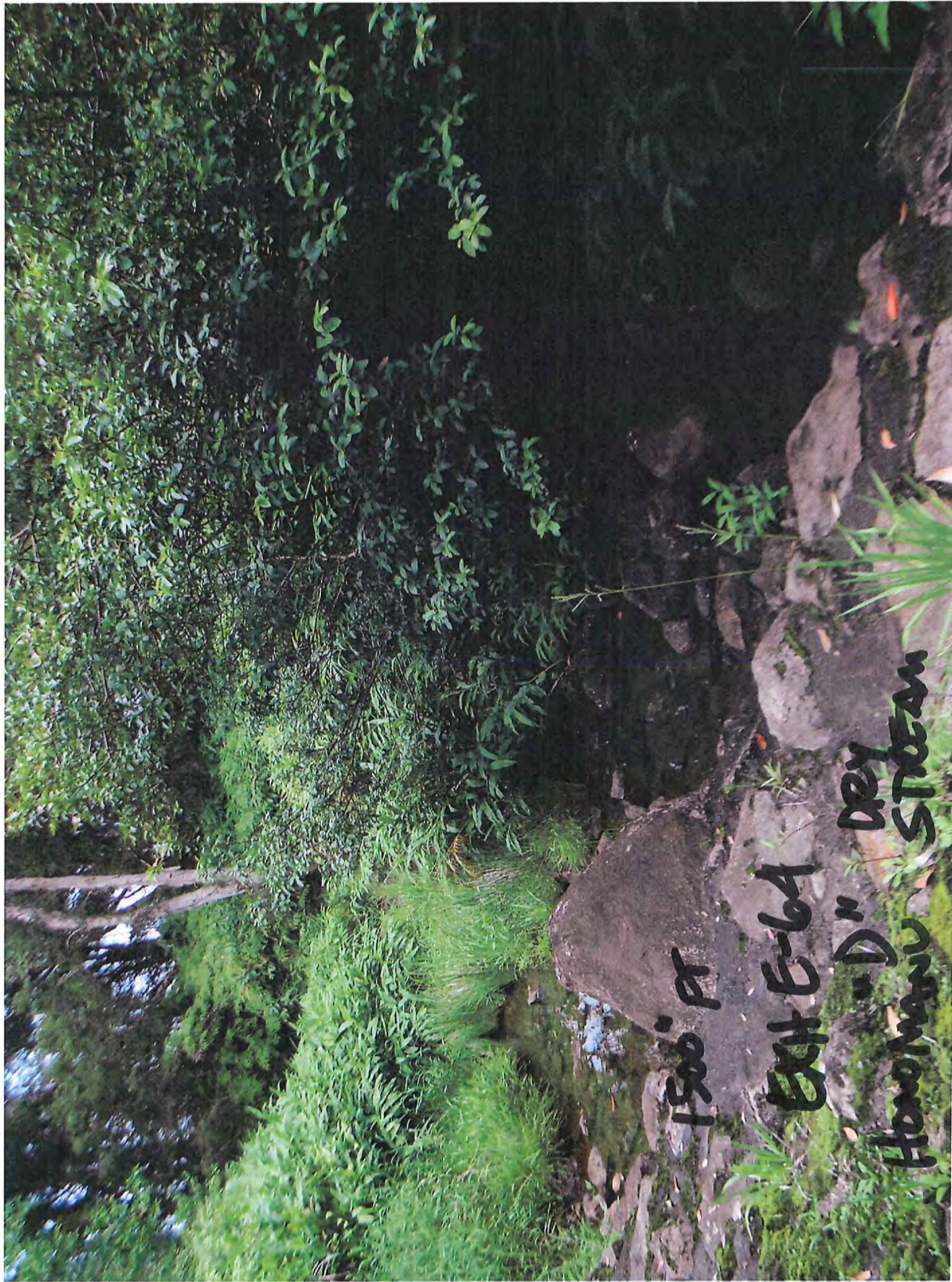


EXE LA  
"B"





EXH. E-6A  
"C"



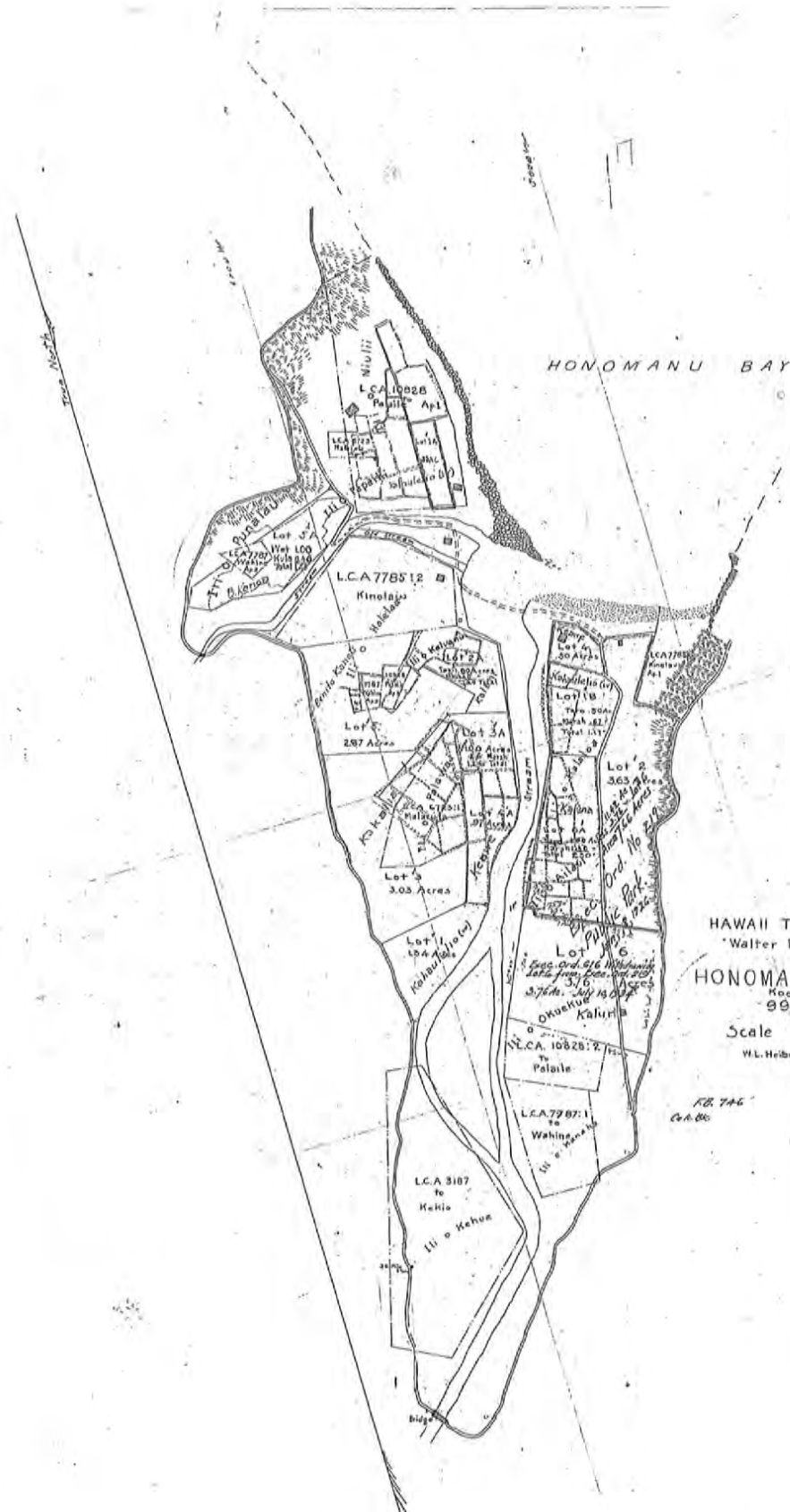
1500 FT

Exit E-64

Hono Manu "D" Dry Stream



TMK - 1-1-01  
Dr. 82 (33)



HAWAII TERRITORY SURVEY  
 Walter E Wall, Surveyor  
**HONOMANU HOMESTEADS**  
 Koolau, Maui.  
 999 Lease  
 Scale 1 inch = 200 feet  
 W.L. Hebron Jan. 1903

18.746  
 C.A. 86  
 Reg. Map No. 2467  
 E.H.M.H.P.T.

**EXHIBIT E-65**

**2014 STATE OF HAWAII WATER QUALITY MONITORING AND  
ASSESSMENT REPORT:**  
Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress  
Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117)



The Hawaii State Department of Health  
Clean Water Branch  
Honolulu, Hawaii  
September 2, 2014

**EXHIBIT** : E-606

MAUI Stream Waters

Assessed Water Body	Water Body Type	Scope of Assessment	Geocode ID	Season	Enterococci	TN	NO <sub>3</sub> +NO <sub>2</sub>	TP	Turbidity	TSS	Other Pollutants	Category	TMDL Priority
Aielele	Stream	EN	6-5-20		?	?	?	?	?	?		3	
E. Wailuaiki	Stream	EN	6-4-16		?	?	?	?	?	?		3	
Haipuaena	Stream	EN	6-4-07		?	?	?	?	?	?		3	
Hanawi	Stream	EN	6-4-22		?	?	?	?	?	?		3	
Hanehoi	Stream	En	6-3-11		?	?	?	?	?	?		3	
Hawawana	Stream	EN	6-3-13		?	?	?	?	?	?		3	
Hoalua	Stream	EN	6-3-12		?	?	?	?	?	?		3	
Honokohau	Stream	EN	6-1-11	Dry	?	A	A	A	A	A		2,3	
Honokohau	Stream	EN	6-1-11	Wet	?	Ac	Ac	Ac	A	Ac		2,3	
Honokowai	Stream	EN	6-1-07		?	?	?	?	V	?		3,5	M
Honolua	Stream	EN	6-1-10		?	?	?	?	?	?		3	
Honomanu	Stream	EN	6-4-09		?	?	?	?	?	?		3	
Honopou	Stream	EN	6-3-08	Wet	?	?	?	?	A	?		2,3	
Hoolawa	Stream	EN	6-3-09		?	?	?	?	?	?		3	
Iao	Stream	EN	6-2-09		?	?	?	?	V	?	Trash	3,5	M
Kaaiea	Stream	EN	6-4-02		?	?	?	?	?	?		3	
Kahakuloa	Stream	EN	6-2-03	Dry	?	A	A	A	A	A		2,3	
Kahakuloa	Stream	EN	6-2-03	Wet	?	?	?	?	A	?		2,3	
Kahana	Stream	EN	6-1-08		?	?	?	?	V	?		3,5	M
Kahoma	Stream	EN	6-1-05		?	?	?	?	V	?		3,5	M
Kailua	Stream	EN	6-3-14		?	?	?	?	?	?		3	
Kakipi	Stream	EN	6-3-07		?	?	?	?	?	?		3	
Kauaula	Stream	EN	6-1-04		?	?	?	?	?	?		3	
Kaupakulua	Stream	EN	6-3-03		?	?	?	?	?	?		3	
Kolea	Stream	EN	6-4-03		?	?	?	?	?	?		3	

Decision Codes: ? = insufficient data, A = attained, Ar = attained (TMDL approved for parameter), Ac = attained (with combined season data), N = not attained, Nr = not attained (TMDL approved for parameter), Nc = not attained (with combined season data), N1 = not attained (2x the standard), N1c = not attained (with combined data, 2x the standard), V = visual listing from 2001-2004, Y = previous listing from 1998 or earlier, Category: 1 = all uses attained, 2 = some uses attained, 3 = not enough data to evaluate, 4 = at least one use not attained, but no TMDL needed, 4a = TMDL approved, 5 = at least one use not attained, TMDL needed: TMDL Priority Codes: High (H), Medium (M), & Low (L) priority for initiating TMDL development within the current monitoring and assessment cycle (through October 31, 2013); IP = TMDL development in progress; prior assessments confirmed with new data are shaded; category changes are bolded, italicized, underlined & shaded.

MAUI Marine Waters

Water Body Type	Scope of Assessment	Geocode ID	Wet/Dry Criteria	Enterococci	TN	NO <sub>3</sub> +NO <sub>2</sub>	NH <sub>4</sub>	TP	Turbidity	Chl a	Other Pollutants	Category	TMDL Priority
C	Ahihi-Kinaiu Natural Area Reserve	HIW00084	Dry	?	?	?	?	?	?	?		3	
C	Alaeloa Beach	HI616569	Dry	?	?	?	?	?	?	?		3	
C	Awalua Beach	HI839739	Dry	?	?	?	?	?	?	?		3	
C	Father Jules Papa	HI525524	Dry	?	?	?	?	?	?	?		3	
C	Fleming Beach North	HI253548	Dry	A	?	?	?	?	N	N		2,3,5	M
C	H.A. Baldwin Beach Co. Park	HI846900	Dry	A	?	?	?	?	N	?		2,3,5	L
C	Hamao	HI287670	Dry	?	?	?	?	?	?	?		3	
C	Hana Bay	HI996835	Dry	?	?	?	?	?	?	?		3	
C	Hanaka'o Beach Co. Park	HI797917	Dry	A	A	N	N	N	N	N		2,5	M
C	Hanaka'o Station*	HIW00165	Dry	?	?	N	?	?	N	?		3,5	M
C	Hata's	HI553820	Dry	A	?	?	?	?	?	?		2,3	
C	Honokeana Bay	HI229021	Dry	?	?	?	?	?	?	?		3	
C	Honokohau Bay	HI432902	Dry	?	?	?	?	?	?	?		3	
C	Honokowai Beach Co. Park	HI412391	Dry	A	A	N	N	A	N	N		2,5	M
C	Honokowai Point to Kaanapali	HIW00139	Dry	?	N	A	N	A	A	A		2,3,5	M
C	Honolua Bay	HI280286	Dry	A	N	N	N	N	?	N		2,3,5	L
C	Honomanu Bay	HI985873	Wet	N	?	?	?	?	?	?		3,5	L
C	Ho'okipa Beach Co. Park	HIW00024	Dry	A	?	?	?	?	N	?		2,3,5	L
C	H-Poko Papa	HI901232	Dry	?	?	?	?	?	?	?		3	
C	Huakini Bay	HI385800	Dry	?	?	?	?	?	?	?		3	
C	Kaanapali (Kahekili Beach)	HI643627	<i>Wet</i>	A	A	<u>A</u>	<u>A</u>	A	N	A		2,5	M
C	Kaanapali (Sheraton Kaanapali Shoreline)	HIW00022	Dry	A	?	?	?	?	N	N		2,3,5	M
C	Kahana (Mahinahina Condo Shoreline)	HI160433	Dry	A	N	N	N	N	N	N		2,5	M

**Decision Codes:** ? = insufficient data, A = attained, A<sub>T</sub> = attained (TMDL approved for parameter), N = not attained (TMDL approved for parameter), V = visual listing from 2001-2004, Y = previous listing from 1998 or earlier.; **Category:** 1 = all uses attained, 2 = some uses attained, 3 = not enough data to evaluate, 4 = at least one use not attained, but no TMDL needed, 4a = TMDL needed, 5 = at least one use not attained, TMDL needed; **TMDL Priority Codes:** High (H), Medium (M), & Low (L) priority for initiating TMDL development within the current monitoring and assessment cycle (through October 31, 2013); **IP** = TMDL development in progress; prior assessments confirmed with new data are shaded; *category changes are bolded, italicized, underlined & shaded.*

Table 13. Ranked diversions sites by amount of habitat returned. Type is FD = Flow diversion or return of water for habitat and barrier = improve fish passage due to entrainment issues or lack of migratory pathway.

Stream Name	Location	Watershed ID	Type	Habitat Units Lost	Rank	% Habitat Units Lost	Cumulative % Lost Habitat Units
Honomanū	Downstream D3	640095	FD	8,359	1	12.4%	12.4%
Puohokamoa	Between D2 – D3	640063	barrier	3,862	2	5.7%	18.1%
Hanawi	Upstream D1	640221	barrier	3,456	3	5.1%	23.3%
Honomanū	Between D2 – D3	640093	barrier	3,233	4	4.8%	28.1%
Kopili'ula	Upstream D1	640171	barrier	3,203	5	4.8%	32.8%
E. Wailua Iki	Upstream D1	640161	barrier	2,535	6	3.8%	36.6%
Waikamoi	Between D2 – D3	640043	barrier	2,442	7	3.6%	40.2%
W. Wailua Iki	Upstream D1	640151	barrier	2,364	8	3.5%	43.7%
Puohokamoa	Between D2 – D3	640063	FD	2,151	9	3.2%	46.9%
Haiqua'ena	Between D2 – D3	640073	barrier	2,009	10	3.0%	49.9%
Kopili'ula	Downstream D1	640175	FD	1,934	11	2.9%	52.8%
Makapipi	Downstream D1	640235	FD	1,921	12	2.9%	55.6%
Puohokamoa	Downstream D4	640065	FD	1,905	13	2.8%	58.4%
Makapipi	Upstream D1	640231	barrier	1,880	14	2.8%	61.2%
E. Wailua Iki	Downstream D1	640165	FD	1,841	15	2.7%	64.0%
W. Wailua Iki	Downstream D1	640155	FD	1,656	16	2.5%	66.4%
Waiohuc	Upstream D1	640181	barrier	1,499	17	2.2%	68.7%
Honomanū	Upstream D1	640091	barrier	1,489	18	2.2%	70.9%
Kapā'ula Gulch	Upstream D1	640211	barrier	1,467	19	2.2%	73.0%
Punalau	Between D3 – D4	640084	barrier	1,460	20	2.2%	75.2%
Waikamoi	Between D3 – D4	640044	barrier	1,299	21	1.9%	77.1%
Waikamoi	Between D2 – D3	640043	FD	1,219	22	1.8%	78.9%
Waiohuc	Downstream D1	640185	FD	1,219	23	1.8%	80.8%
Punalau	Downstream D4	640085	FD	1,169	24	1.7%	82.5%
Haiqua'ena	Between D2 – D3	640073	FD	1,084	25	1.6%	84.1%
Puohokamoa	Between D3 – D4	640064	FD	1,020	26	1.5%	85.6%
Waikamoi	Downstream D4	640045	FD	962	27	1.4%	87.0%
Kālea	Upstream D4	640034	barrier	953	28	1.4%	88.5%
Waikamoi	Between D3 – D4	640044	FD	930	29	1.4%	89.8%
Punalau	Upstream D3	640083	barrier	897	30	1.3%	91.2%
Paakea Gulch	Upstream D1	640191	barrier	825	31	1.2%	92.4%
Puohokamoa	Between D3 – D4	640064	barrier	804	32	1.2%	93.6%
Haiqua'ena	Between D3 – D4	640074	barrier	757	33	1.1%	94.7%
Haiqua'ena	Between D3 – D4	640074	FD	732	34	1.1%	95.8%

EXHIBIT E-67

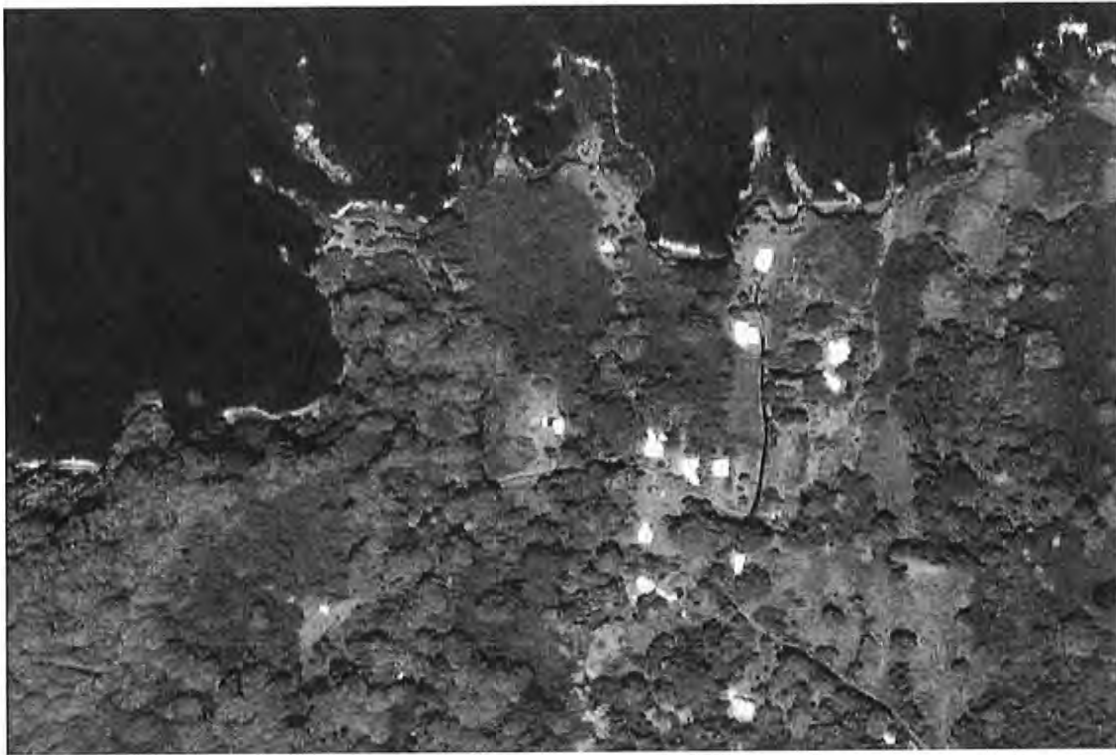
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**Instream Flow Standard Assessment Report**  
**Island of Maui**  
**Hydrologic Unit 6065**  
**Makapipi**

December 2009

PR-2009-16

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**State of Hawaii**  
Department of Land and Natural Resources  
Commission on Water Resource Management



**EXHIBIT E-68**

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#### 4.4 Distribution of Native Freshwater Species

The HSA inventory was general in nature, resulting in major data gaps, especially those related to the distribution and abundance of aquatic organisms – native and introduced – inhabiting the streams. The State of Hawaii Division of Aquatic Resources (DAR) has since continued to expand the knowledge of aquatic biota in Hawaiian streams. Products from their efforts include the compilation and publication of an *Atlas of Hawaiian Watersheds and Their Aquatic Resources* for each of five major islands in the state (Kauai, Hawaii, Oahu, Molokai, and Maui). Each atlas describes watershed and stream features, distribution and abundance of stream animals and insect species, and stream habitat use and availability. Based on these data, a watershed and biological rating is assigned to each stream to allow comparison with other streams on the same island and across the state. The data presented in the atlases are collected from various sources, and much of the stream biota data are from stream surveys conducted by DAR. Figure 4-4 illustrates the DAR survey locations on Makapipi Stream. Currently, efforts have been focused on updating the atlases with more recent stream survey data collected statewide, and developing up-to-date reports for Commission use in determining the interim IFS recommendations for east Maui. The following is a brief summary of findings for Makapipi Stream.

- **Point Quadrat Survey.** A number of native stream animals were observed in Makapipi Stream, including oopu naniha (*Stenogobius hawaiiensis*), oopu nakea (*Awaous guamensis*), oopu akupa (*Eleotris sandwicensis*), oopu alamoo (*Lentipes concolor*), opae kalaole (*Atyoida bisulcata*), and aholehole (*Kuhlia xenura*). During the most recent surveys, oopu alamoo was observed in the middle and upper reaches. Opaē kalaole was only observed in the upper reach; although it was recorded to inhabit the lower and middle reaches of Makapipi Stream. Introduced species such as river prawns (*Macrobrachium lar*) were also observed in the stream.
- **Estuary Survey.** Makapipi has a small estuary; however, no estuary survey was conducted.
- **Insect Survey.** Native damselfly species were observed in the upper and headwater reaches Makapipi Stream. Of the damselflies observed were blackburn's Hawaiian damselfly (*Megalagrion blackburni*), beautiful Hawaiian damselfly (*Megalagrion calliphya*), Hawaiian upland damselfly (*Megalagrion hawaiiense*), blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrohamatum*), and pacific Hawaiian damselfly (*Megalagrion pacificum*). The pacific Hawaiian damselfly is currently proposed for listing as Endangered under the Federal Endangered Species Act.
- **Watershed and Biological Rating.** Makapipi watershed rates fairly well (score of 8 out of 10) for Maui and statewide. A combination of forested lands, high rainfall amounts, and moderate reach diversity contribute to the rating of this watershed. The stream rates above average (score of 6 out of 10) on biota due to the high diversity of native species as well as introduced species observed in the stream.

Makapipi Stream provided poor instream habitats due to reduced streamflow and losing sections where water flowed subsurface. Many of the survey sites in the middle and upper reaches were dry, providing no instream habitat. Isolated pools of water had lower water temperatures, which was indicative of spring water input. Only the native shrimp was observed in the upper reach where flow was minimal, but not dry.

The SWCA Environmental Consultants, at the request of Hawaiian Commercial and Sugar Company, conducted a literature review of the existing data collected by DAR, USGS, and other investigators (Ford et. al., 2009). The objective of this document was to present biological information that may help the Commission in determining reasonable and beneficial instream and offstream uses of the surface water in

east Maui. The authors stressed that no data exists to suggest “any of the nine native Hawaiian amphidromous species is at risk of either endangerment and/or extinction in east maui streams or else where in the State”, and that dry reaches in diverted streams are periodically wetted by freshets, allowing streamflow continuity and the upstream migration of native species. On the other hand, there is no proof that continued habitat degradation in some of the streams due to dewaterment will not affect species survival (PR-2009-18, 85.0). Other investigators have reported that “hihiwai were limited to about 185 meters and 223 meters in the lower reaches of Waiohue and Waikolu Streams [Maui], respectively...and suggested this was due to the effect of dewaterment on habitat availability” (as cited in Ford et. al., 2009). It was also important to note that frequent changes in stream community structure, such as a change in the streambed composition due to a high flow event, that may result in absence of native stream animals should not be interpreted as a negative indicator of stream health.

The consultant summarized data mainly from the USGS habitat availability study (Gingerich and Wolff, 2005) and DAR’s Atlas of Hawaiian Watersheds and Their Aquatic Resources (Tables 4-5 and 4-6). Please note that Commission staff is awaiting updated data from DAR and will supplement the following tables with new data. Compared with the other east Maui streams, a diversity of stream animals were observed in Makapipi Stream. Akupa, nakea, nopili, alamoo, and opae kalaole were observed throughout the stream channel. However, extensive surveys conducted by the USGS revealed no alamoo above the diversions, and results from DAR surveys do not specifically indicate aquatic species observed above the diversions. According to Table 4-5, the opae was the most conspicuous species that was found in most of the east Maui streams except Punalau and Ohia. One alien amphidromous species, the Tahitian prawn was also present in Makapipi Stream. Since Makapipi Stream already has a diversity of native stream animals under diverted conditions, it has the potential to carry a full compliment of native stream fauna if allowed continuous mauka to makai flow.



Based on the two land cover classification systems, the land cover of Makapipi consists mainly of evergreen forests. The headwaters of Makapipi Stream are fed by dense native Ohia forests and native Uluhe shrub lands that lie within the Hanawi Natural Area Reserve. The intermediate slopes are dominated by native Uluhe shrub lands and some alien vegetation that lie within the Koolau Forest Reserve. The lower slopes are mostly alien forests and alien grasslands with scattered native Ohia forests.

The land cover maps (Figures 2-6 and 2-7) provide a general representation of the land cover types in Makapipi. Given that the scale of the maps is relatively large, they may not capture the smaller cultivated lands or other vegetation occupying smaller parcels of land. Land cover types may also have changed slightly since the year when the maps were published.

**Table 2-4.** C-CAP land cover classes and area distribution in Makapipi (Source: National Oceanographic and Atmospheric Agency, 2000).

Land Cover	Description	Area (mi <sup>2</sup> )	Percent of Unit
Evergreen Forest	Areas where more than 67 percent of the trees remain green throughout the year	2.78	84.5
Scrub/Shrub	Areas dominated by woody vegetation less than 6 meters in height	0.27	8.2
Grassland	Natural and managed herbaceous cover	0.20	6.1
Bare Land	Bare soil, gravel, or other earthen material with little or no vegetation	0.03	0.9
Low Intensity Developed	Constructed surface with substantial amounts of vegetated surface	0.01	0.2
Unconsolidated Shoreline	Material such as silt, sand, or gravel that is subject to inundation and redistribution by water	< 0.01	0.1
Water	Areas of open water with less than 30 percent of trees, shrubs, persistent emergent plants, or other land cover	< 0.01	< 0.1

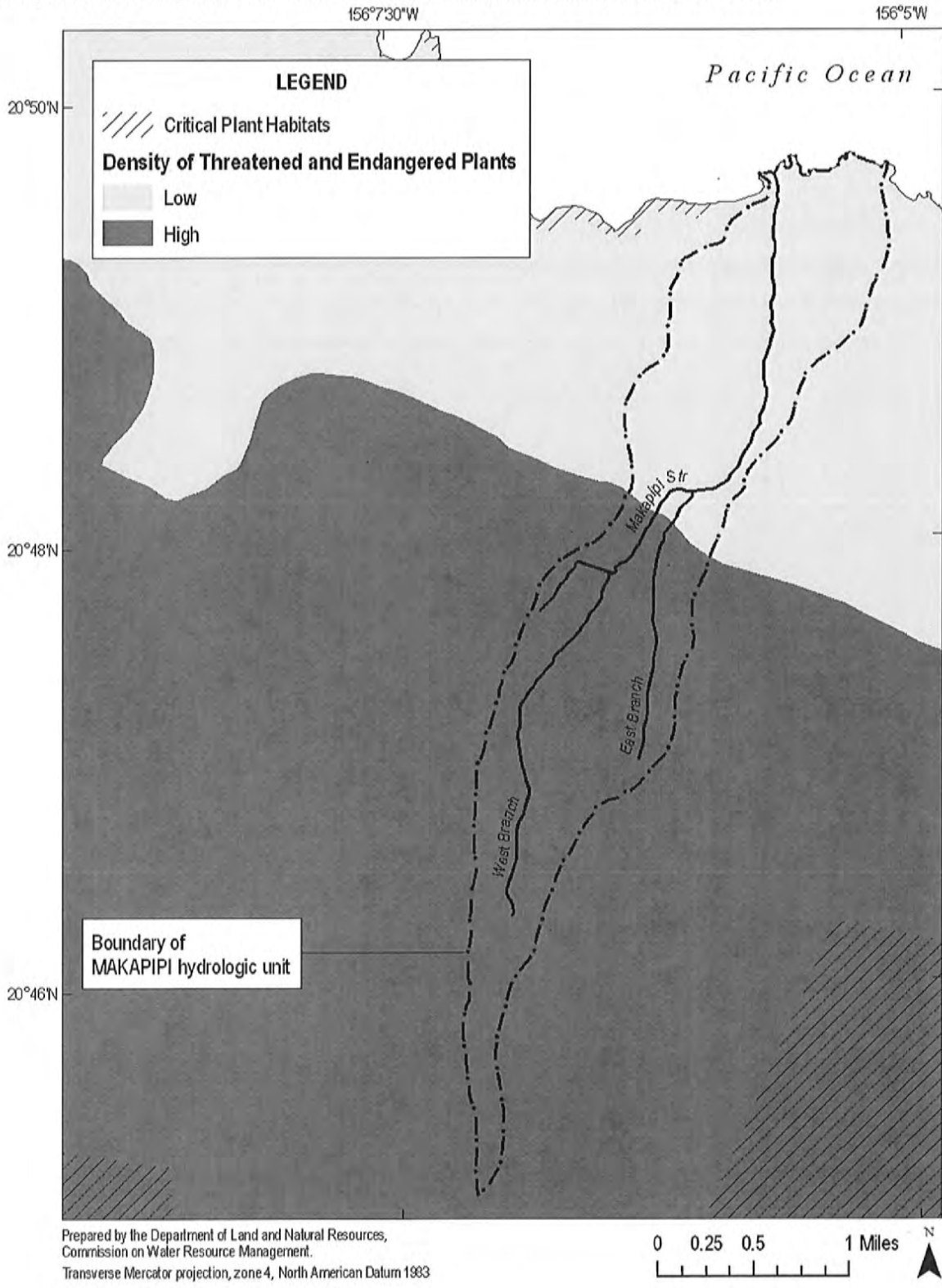
**Table 2-5.** HI-GAP land cover classes and area distribution in Makapipi (Source: HI-GAP, 2005).

Land Cover	Area (mi <sup>2</sup> )	Percent of Unit
Alien Forest	1.55	47.2
Open Ohia Forest (uluhe)	0.83	25.3
Closed Ohia Forest (native shrubs)	0.39	11.9
Closed Ohia Forest (uluhe)	0.31	9.5
Uncharacterized Open-Sparse Vegetation	0.16	4.8
Very Sparse Vegetation to Unvegetated	0.02	0.5
Alien Grassland	0.01	0.3
Uluhe Shrubland	0.01	0.3
Undefined	< 0.01	< 0.1
Uncharacterized Forest	< 0.01	< 0.1

## 2.8 Flood

Floods usually occur following prolonged or heavy rainfall associated with tropical storms or hurricanes. The magnitude of a flood depends on topography, ground cover, and soil conditions. Rain falling on areas with steep slopes and soil saturated from previous rainfall events tends to produce severe floods in low-lying areas. Four types of floods exist in Hawaii. Stream or river flooding occurs when the water level in a stream rises into the flood plain. A 100-year flood refers to the probability of the flood happening once in a hundred years, or 1 percent chance of happening in a given year. Flash floods occur within a few hours after a rainfall event, or they can be caused by breaching of a flood safety structure such as a dam. Flash flooding is common in Hawaii because the small drainage basins often have a short

**Figure 6-4.** Critical plant habitats, and density of threatened and endangered plant species for Makapipi hydrologic unit (Source: Jacobi, 1989; Scott et al., 1986; State of Hawaii, Office of Planning, 1992, 2004b; 2004d; USGS, 2001b).



## 5.0 Outdoor Recreational Activities

Water-related recreation is an integral part of life in Hawaii. Though beaches may attract more users, the value of maintaining streamflow is important to sustaining recreational opportunities for residents and tourists alike. Streams are often utilized for water-based activities, such as boating, fishing, and swimming, while offering added value to land-based activities such as camping, hiking, and hunting. Growing attention to environmental issues worldwide has increased awareness of stream and watershed protection and expanded opportunities for the study of nature; however, this must be weighed in conjunction with the growth of the eco-tourism industry and the burdens that are placed on Hawaii's natural resources.

The State of Hawaii Department of Health (DOH) maintains water quality standards (HAR 11-54) for recreational areas in inland recreational waters based on the geo-mean of *Enterococcus*, a fecal indicator: 33 colony-forming units per 100 mL of water or a single-sample maximum of 89 colonies per 100 mL. This is for full-body contact (swimming, jumping off cliffs, etc.). If *Enterococcus* exceeds those values, the water body is considered to be impaired. DOH also has a standing advisory for *Leptospirosis* in all freshwater streams. The marine recreational zone, which extends from the shoreline seaward to 1,000 feet from shore, requires an *Enterococci* geo-mean of less than 7 colony-forming units per 100 mL of water, to protect human health.

The recreational resources of Makapipi Stream were classified as "substantial" by the HSA's regional recreation committee. The HSA identified opportunities for hiking, fishing, hunting, swimming, and scenic views related to Makapipi. Of these four recreational opportunities, fishing and scenic views were considered to be high-quality experiences (National Park Service, Hawaii Cooperative Park Service Unit, 1990) (Table 5-1).

**Table 5-1.** Hawaii Stream Assessment survey of recreational opportunities by type of experience.

	Urban		Country		Semi-Natural		Natural	
	Norm	High	Norm	High	Norm	High	Norm	High
Camping								
Hiking			■					
Fishing				■				
Hunting					■			
Swimming			■					
Boating								
Parks								
	Trail		Road		Ocean		Air	
Scenic Views						■	■	
Nature Study	Educational		Botanical					

According to public hunting data, Hunting Unit B on the island of Maui consists of portions of the Koolau Forest Reserve and Hunting Unit N1 consists of portions of the Hanawi Natural Area Reserve. Hunting Unit B within Hanawi occupies approximately 13 percent of the hydrologic unit, whereas Hunting Unit N1 occupies 38 percent of the unit (Figure 5-1). A permit is required for the hunting of wild pigs and goats, using rifles, shotguns, bows and arrows, and dogs. Bag limits are two pigs and two goats of either sex per day, while the hunting season is open year-round on Saturdays, Sundays, and State holidays. Handguns are allowed for the hunting of pigs with or without dogs.

According to Gingerich (1999b), Makapipi Stream is dry in the 0.7 mile reach between the Koolau Ditch to the stream gaging station (station 16507000). Streamflow records show no flow during the period of 1932 to 1945, indicating that the stream is not perennial in that reach of the stream. This is also the same period when there is no ground water flow input from Makapipi Spring. It is unknown whether the stream is gaining or losing in other sections of the stream. Base flow estimates show that the average annual base flow at the station is about 1.96 million gallons per day (Gingerich, 1999b), and part of this flow may be gained from Makapipi Spring.

In cooperation with the Commission on Water Resource Management, the USGS conducted a study (Gingerich, 2005) to assist in determining reasonable and beneficial noninstream and instream uses of surface water in northeast Maui. The purpose of the study was to develop methods of estimating natural (undiverted) median streamflow, total flow statistics (TFQ), and base flow statistics (BFQ) at ungaged sites where observed data are unavailable. The study area lies between the drainage basins of Kolea Stream to the west and Makapipi Stream to the east. Basin characteristics and hydrologic data for the study area were collected and analyzed. One of the products of the study is a set of regression equations that can be used to estimate natural (undiverted) TFQ<sub>50</sub>, BFQ<sub>50</sub>, TFQ<sub>95</sub>, and BFQ<sub>95</sub> at gaged and ungaged sites. The subscripts indicate the percentage of time the flow, either total or base flow, is equaled or exceeded. Results of the study show that the streams in the eastern side of the study area (i.e., east of Keanae Valley) have the lowest reductions in streamflow due to diversions at the 1,300 feet elevation. Therefore, the stream reaches immediately downstream from the diversions are dry most of the time.

Streamflow statistics at the gaging station was estimated using the regression equations, and then compared to the measured flow to assess the accuracy of the regression method by computing the relative error. Relative error is the percent difference between the measured flow and the estimated statistic. The flow statistics and associated statistical comparisons for station 16507000 in Makapipi Stream are presented in Table 3-6. Note that the measured flows are different from the TFQ<sub>50</sub> values in Table 3-4. That is because the measured flows in the study were adjusted to a common base period for comparison so that the differences in flow among stations reflect spatial differences in climate and basin characteristics as well as temporal differences in rainfall (Gingerich, 2005). The adjusted flows are listed in Table 3-5.

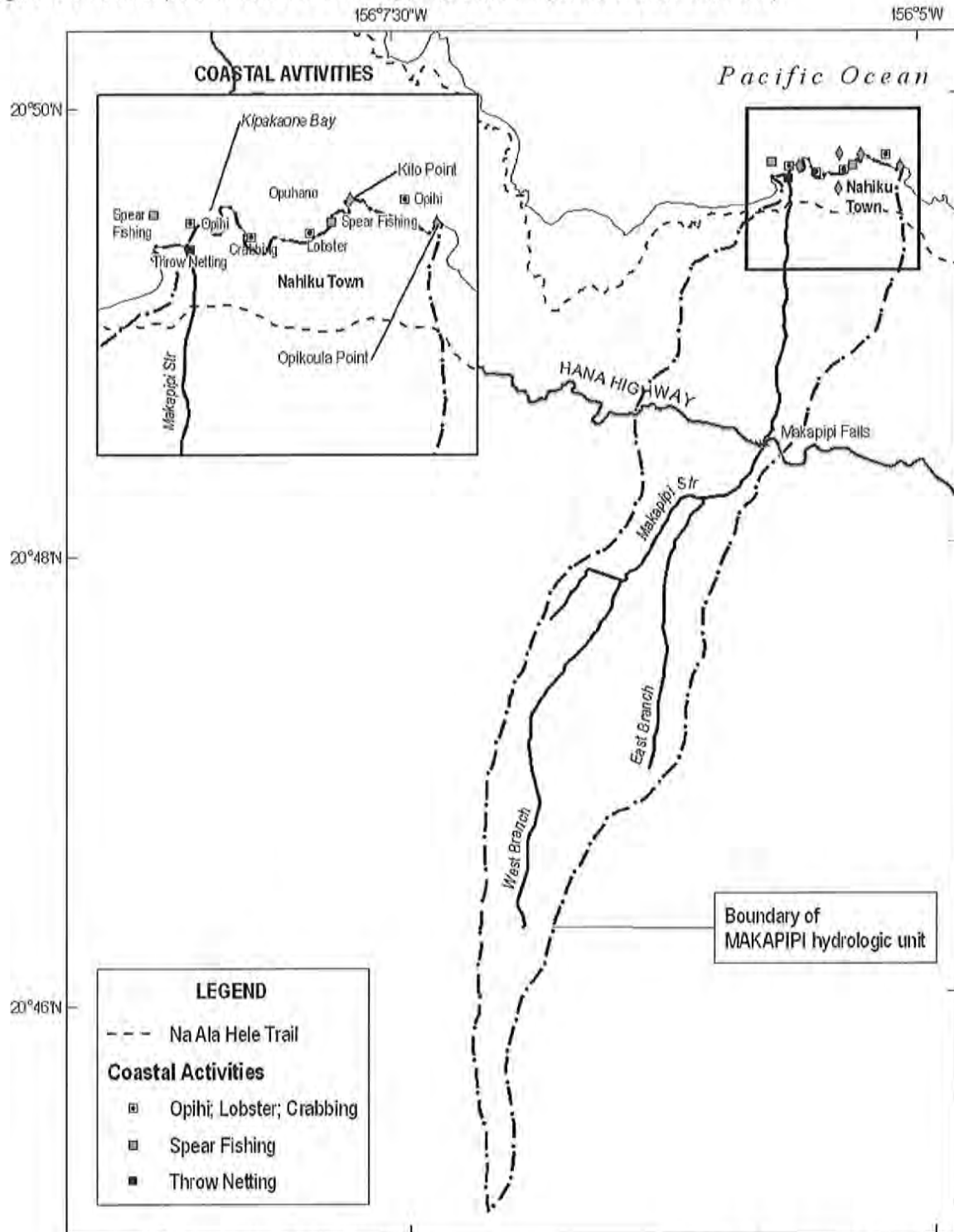
**Table 3-5.** Selected estimated median and low-flow characteristics for the continuous-record site in the Makapipi hydrologic unit (Gingerich, 2005, Table 2).

[Qxx is the xx percent flow duration of streamflow; ft<sup>3</sup>/s, cubic feet per second; base period is 1914-17, 1921-2001; gaging-station number is preceded by 16 and ends in 00; active stations are shown in *bold italics*; +, combined with record from indicated station; index station is station 5180; -, no adjustment; NA, not applicable]

Gaging-station number	Length of concurrent record (years)	TFQ <sub>50</sub>		BFQ <sub>50</sub>		TFQ <sub>95</sub>		BFQ <sub>95</sub>	
		during concurrent period (ft <sup>3</sup> /s)	adjusted to index station (ft <sup>3</sup> /s)	during concurrent period (ft <sup>3</sup> /s)	adjusted to index station (ft <sup>3</sup> /s)	during concurrent period (ft <sup>3</sup> /s)	adjusted to index station (ft <sup>3</sup> /s)	during concurrent period (ft <sup>3</sup> /s)	adjusted to index station (ft <sup>3</sup> /s)
5070	13	2.9	2.2	1.6	1.3	0	0	0	0

The regression equations performed poorly in predicting the higher flow statistics (TFQ<sub>50</sub> and BFQ<sub>50</sub>) and the lower flow statistics (TFQ<sub>95</sub> and BFQ<sub>95</sub>) for the stream gaging station in Makapipi Stream. The high flow statistics were largely overestimated because the regression equations did not account for flow losses in the dry reach between the Koolau Ditch and the gaging station, where flow was mainly dependent on spring discharge. Relative errors between measured and estimated flows for the lower flow statistics were not available and not necessarily meaningful since the stream is intermittent and it goes dry during low flow conditions.

Figure 7-1. Aesthetic points of interest for the Makapipi hydrologic unit (Source: USGS, 1996; 2001b).



Prepared by the Department of Land and Natural Resources,  
Commission on Water Resource Management.  
Transverse Mercator projection, zone 4, North American Datum 1983



Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources,  
Commission on Water Resource Management

## Effects of Surface-Water Diversions on Habitat Availability for Native Macrofauna, Northeast Maui, Hawaii

Scientific Investigations Report 2005-5213

U.S. Department of the Interior  
U.S. Geological Survey

**EXHIBIT** E-69

**Table 8.** Summary of PHABSIM modeled habitat for intensively studied diverted stream sites, northeast Maui, Hawaii.

[ft<sup>3</sup>/s, cubic foot per second; ft<sup>2</sup>, square feet; values shown represent a range of results for all aquatic species except opae using riffle models A and B; NA, not applicable]

Stream site	Median base flow remaining in stream (ft <sup>3</sup> /s)		Habitat available at diverted median base-flow conditions relative to habitat available at natural median base-flow condition (percent of natural habitat)	Flow needed to produce habitat relative to habitat available at natural median base-flow conditions (ft <sup>3</sup> /s)			Amount of habitat relative to habitat available at natural median base-flow conditions with flow at percentage of natural base flow
	Diverted conditions	Natural (undiverted) conditions		50 percent of natural habitat	90 percent of natural habitat	90 percent of natural base flow	
Hanawi lower	21	26	99-101	NA	NA	NA	99-101
Hanawi middle	11	16	99-101	NA	NA	NA	100-101
Kopiinula lower	2.8	9.5	51-53	2.6-2.7	7.6-7.7	70-71	94-95
Kopiinula middle	1.2	6.5	51-52	1.1-1.2	4.8	77-78	96-97
Wailanui lower	1.1	6.7	51-52	1-1.1	4.2-4.4	83-84	97
Wailuanui middle	1.0	6.1	50-54	.66-1	4.7-4.9	73-75	95-96
Honomanu lower	0	9.0	0	.94-1	4-4.5	90-92	99-100
Waikamoi middle-lower	.20	6.7	27-46	.13-1.1	4.9-5.1	78-82	96
Waikamoi middle-upper	1.6	6.6	56-57	1.2	3.8-4.1	81-84	99

**Table 9.** Summary of PHABSIM modeled opae habitat for intensively studied diverted middle stream sites, northeast Maui, Hawaii.

[ft<sup>3</sup>/s, cubic foot per second; ft<sup>2</sup>, square feet; values shown represent a range of results using riffle models A and B; NA, not applicable]

Stream site	Median base flow remaining in stream (ft <sup>3</sup> /s)		Habitat available at diverted median base-flow conditions relative to habitat available at natural median base-flow condition (percent of natural habitat)	Flow needed to produce habitat relative to habitat available at natural median base-flow conditions (ft <sup>3</sup> /s)			Amount of habitat relative to habitat available at natural median base-flow conditions with flow at percentage of natural base flow
	Diverted conditions	Natural (undiverted) conditions		50 percent of natural habitat	90 percent of natural habitat	90 percent of natural base flow	
Hanawi middle	11	16	94-95	NA	NA	NA	98-99
Kopiinula middle	1.2	6.5	65-66	NA	4.4-4.5	82-83	97
Wailuanui middle	1.0	6.1	64-70	NA	4.1-4.4	82-84	97
Waikamoi middle-lower	.20	6.7	40-64	.61	2.4-4.4	84-92	97-98
Waikamoi middle-upper	1.6	6.6	70	NA	3.7-3.8	86-87	98

## Waikamoi Stream & Waterfalls

Last updated 28 May 2009 by Walker's Adventures & Sight (94) on 4, Road (nature), Road to Hana, Road to Hana sites, Waterfall

Hana, Road to Hana sites, Waterfall



A visitor stands at the top of Waikamoi Stream's small waterfall, just a few steps from the road.

Rating: ★★★★★

*In a nutshell: A drive-up stop, one waterfall and pool are right next to the road. The second, larger waterfall and pool just upstream are impressively beautiful, and tragically underrated by other guidebooks.*

*Minuses: Unpredictable flow; also unpredictable visitor count (can be packed or empty, with no rhyme or reason.)*

*Sound bite: "This is all I wanted to do in Hawaii!"*

### DETAILS:

A popular, user-friendly (but frequently under-rated) stop on the Road to Hana. The reason this is so underrated by the other guidebooks is that they came to see it on the wrong day. The water source is heavily tapped and diverted above and these falls can be essentially "turned off" by [1] to feed thirsty sugar plantations. You can tell if this is worth a stop by looking at the waterfall closest to the road. If it is flowing, then you're in for a treat.

The first waterfall is literally steps from the road, and has a beautiful pool tailor made for swimming. The bigger second waterfall has multiple places to sit at the bottom and let the water fall on you. The last time I was there, a family was sitting under the waterfall, and I overheard the father blabberly claim "this is all I ever wanted to do in Hawaii." I don't know if I personally would be satisfied with just Waikamoi - but it is a really sweet place, that is so easily accessible without any serious hiking, that for someone doing an unplanned drive thru, it could be the nicest waterfall they swim in.

Getting to the second fall requires a scramble up a (usually) mostly-dry stream bed - but unless the water is raging, it is pretty easy (and if the water is raging, don't even try it).

### Key info:

Mile Marker: 49.9 (Hana Hwy aka Hwy 300)

GPS Coordinates: 20.872256, -156.187316

Facilities: No facilities

[Get directions](#)



A couple enjoy sitting under the larger falls at Waikamoi.

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## Waikamoi Stream & Waterfalls

Last updated 28. May. 2009 by Walker In Adventures & Signs | Rd to H, Pools (natural), Road to Hana, Road to Hana Sites, Waterfalls



A visitor stands at the top of Waikamoi Stream's small waterfall, just a few steps from the road.

Rating: ★★★★★

**In a nutshell:** A drive-up stop, one waterfall and pool are right next to the road. The second, larger waterfall and pool just upstream are impressively beautiful, and tragically underrated by other guidebooks.

**Minuses:** Unpredictable flow; also unpredictable visitor count (can be packed or empty; with no rhyme or reason.)

**Sound-bite:** "This is all I wanted to do in Hawaii."

### DETAILS:

A popular, user friendly (but frequently under-rated) stop on the Road to Hana. The reason this is so underrated by the other guidebooks is that they came to see it on the wrong day. The water source is heavily tapped and diverted above and these falls can be essentially "turned off" by [EMI](#) to feed thirsty sugar plantations. You can tell if this is worth a stop by looking at the waterfall closest to the road. If it is flowing, then you're in for a treat.

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Getting to the second fall requires a scramble up a (usually) mostly-dry stream bed - but unless the water is raging, it is pretty easy (and if the water is raging, don't even try it!)

### Key Info:

**Mile Marker:** #6.9 (Hana Hwy aka Hwy 300)

**GPS Coordinates:** 20.872358, -156.187316

**Facilities:** No facilities

[Get directions](#)



A couple enjoy sitting under the larger falls at Waikamoi

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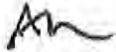
EXHIBIT E-71

State of Hawaii  
Department of Land and Natural Resources  
DIVISION OF AQUATIC RESOURCES

May 17, 2010

TO: Ken C. Kawahara, Deputy Director-Water  
Commission on Water Resources Management

CC: Laura H. Thielen, Chairperson  
Department of Land & Natural Resources

FROM: Robert T. Nishimoto, Environmental Program Manager   
Division of Aquatic Resources

SUBJECT: Request for stream flow estimates for H<sub>50</sub> and H<sub>70</sub> and the Division of Aquatic Resources' position statement on Minimum Habitat Flows

The Division of Aquatic Resources (DAR) is responsible for the protection and management of living aquatic resources in the waters of Hawaii. The DAR realizes that the Commission on Water Resource Management (CWRM) has the responsibility of balancing the current and future value of multiple uses of water when rendering its decisions on specific Instream Flow Standards. By contrast, the DAR's recommendations focus only on the requirements of the native aquatic biota that fall within the scope of our authority, and do not consider additional instream or offstream uses of stream water. This memorandum reflects DAR's position on the recommendations that support restoration of native species habitat, migratory pathways for **upstream** recruiting individuals and downstream drifting larvae, and overall population structure and health for eight native fish and macroinvertebrate species inhabiting East Maui streams.

On March 11, 2010, the Division of Aquatic Resources met with Native Hawaiian Legal Corporation (NHLC), Commission on Water Resource Management (CWRM), Hawaiian Commercial & Sugar (HC&S), and Maui Department of Water Supply to discuss current data that CWRM has received to date. The DAR presented a spreadsheet of East Maui Stream flow ranks for H<sub>90</sub> and H<sub>100</sub> which are the percent of habitat based on the USGS IFIM study for East Maui Streams. It was requested that DAR recalculate the flow ranks for H<sub>50</sub> and H<sub>70</sub>. H<sub>50</sub> and H<sub>70</sub> were not presented by DAR as DAR staff had already determined that these flow rates for these habitat levels would not support all aspects of the native species life history requirements.

The former administrator to DAR misconstrued DAR's position to the March 11<sup>th</sup> meeting participants when he stated that DAR could calculate H<sub>50</sub> and H<sub>70</sub> flow rates. While DAR has the ability to calculate flows for any habitat level based on the USGS

EXHIBIT E-72

IFIM study, DAR does not believe that  $H_{50}$  or  $H_{70}$  reflect viable flow rates for the protection of native aquatic biota.

On May 4, 2010, the DAR was directed by the DLNR administration to provide the  $H_{70}$  and  $H_{50}$  flow estimates for the DAR recommended streams and these are provide in this document. It is understandable why such a request would be made. Almost by definition, there is an expectation that a linear relationship exists between the amount of habitat and the number of animals. Thus it is tempting to assume that  $H_{70}$  is only 20% less habitat then  $H_{90}$  and therefore would result in only 20% less animals. Similarly,  $H_{50}$  is only 20% less then  $H_{70}$  and therefore only an additional 20% less animals. This conclusion IS NOT supported by the DAR.

DAR fully comprehends the rationale, methods, and results of the USGS IFIM study, and thus understands that it considers only a limited portion of the life history requirements of the native species. The USGS IFIM study primarily considered the attributes of water depth, velocity, and substrate, yet did not consider important components like food production or availability, the presence of suitable refuges, pathways for migration, the availability of spawning habitats, flow mediated triggers for reproductive events, or seasonally variable flow rates. The is not intended as a criticism to the quality of the work provided by USGS, only that as USGS states in their report, "These results are intended to be used along with other biological and hydrological information in development, negotiations, or mediated settlements for instream flow requirements." DAR's position is that  $H_{min}$  ( $H_{90}$ ) or 64% of the naturally occurring base flow represents the minimum viable flow expected to provide suitable conditions for growth, reproduction, and recruitment of native stream animals. Flows lower than the minimum habitat flow would serve primarily maintenance flows where the adult animals "survive" until more suitable flows return.

The DAR's recommendations are based on several lines of evidence. First, DAR biologists and technicians spent considerable time and effort surveying habitat and animal populations in these streams. The results of these surveys found that while some areas within the streams do contain native animals, many stream sections had few or no native species. Second, the DAR compared the results of the stream surveys with estimates of expected native species occurrence by utilizing the Hawaiian Stream Habitat Evaluation Procedure (HSHEP) analytic model, with the results for the 19 East Maui streams provided to CWRM staff on November 20, 2009. The results of the HSHEP also suggest that native animals are missing from a number of stream sections where they should naturally exist. Finally, the DAR used available information and the extensive experience of its staff to develop a general life history description of island stream animals and used this in determining the final list of actions needed to support restoration of native species in these 19 streams.

A general consensus among DAR staff and many outside researchers regarding stream flow and native stream animals' life history is that the animals' behavior changes with changes in seasonal stream flow. For adult animals, periods of higher base flow triggers many reproductive events. The animals react to the higher flows to initiate courtship and

spawning. The animals attached the fertilized eggs to the substrate (fish and mollusks) or to their body (crustaceans). After a period of development, the larvae hatch from the eggs and drift downstream. The newly hatched larvae have a short period of time to reach the ocean before dying thus higher flows serve to successfully transport larger numbers of newly hatched larvae from spawning sites further inland. Once the larvae reach the ocean, they spend 3 to 5 months (in most species) developing in ocean waters. When the animals are ready to return to the stream, they usually return in mass in response to high stream flow events. The small animals, averaging  $\frac{1}{4}$  to 1 inch long, move upstream to find suitable adult habitat. The juveniles that find suitable habitat mature into adults. Adults live for multiple years and can spawn multiple times in a single spawning season. There is evidence in Hawaii and in other Pacific islands that native island stream animals' reproduction commences with the beginning of the wet season and recruitment of young animals peaks toward the end of the wet season. As a result of this generalized life history pattern, the creation of an artificial "wet season" with higher base flows in a flow controlled stream may support many of the animals life history requirements.

DAR supports the following positions regarding restoration efforts in East Maui Streams.

As a general position regarding stream diversion and native aquatic animals:

- The removal of stream diversions and the complete restoration of stream flow would be the best possible condition for native aquatic animals. DAR understands that management of the resource is a balance between the needs of the animals and the needs of people thus supports some use of water from East Maui Streams.
- In no case are additional diversions of stream water recommended, although current levels of stream flow diversion may be appropriate on some streams. Flow restoration is only recommended on 8 of the 19 streams under consideration.
- The prioritization of the East Maui Streams is based upon the "biggest bang for the buck" concept, where priority is placed on streams with the greatest potential to increase suitable habitat for native species.
- The restoration of suitable flows to a single stream is more appropriate than the return of inadequate flow to multiples streams. DAR supports the trade-offs on the restoration of a smaller number of streams with sufficient water (see below) over the return of insufficient water (for example at H<sub>50</sub> or H<sub>70</sub> levels) to a larger number of streams.
- Restoration of stream flow should reflect the water budget of the individual stream catchment. The use of trans-basin water diversions from ditches to restore stream sections should be avoided where at all possible.
- Co-mingling of stream and ditch flows should be avoided where at all possible to limit the potential spread of invasive aquatic species.
- Restoration of streams should be spread out in a geographic sense. This will provide a greater protection against localized habitat disruptions, a wider benefit to estuarine and nursery habitat for nearshore marine species, and result in more comprehensive ecosystem function across the entire East Maui sector.
- Implementation of a long-term monitoring program to analyze the effect of restored flows to native biota, their health, and all aspects of their life history.

With respect to amount of water flow needed in the stream:

- The goal of returning  $H_{min}$  during the wet season and  $C_{min}$  during the dry season is considered the minimum viable flow to achieve suitable conditions for native aquatic animals.
- Minimum viable habitat flow ( $H_{min}$ ) for the maintenance of suitable instream habitat is defined as 64% of Median Base Flow ( $BFQ_{50}$ )(also defined as  $H_{90}$  by USGS studies). DAR expects that these flows will provide suitable conditions for growth, reproduction, and recruitment of native stream animals.
- Minimum viable connectivity flow ( $C_{min}$ ) for the maintenance of a wetted pathway between the ocean and stream habitats is defined as 20%  $BFQ_{50}$ . These flows are expected to allow adult animals to move among habitats and allow recruiting animals to move upstream to suitable habitats. These flows are considered by DAR to be too low to expect suitable long-term growth and reproduction of native stream animals.
- Seasonally adjusted flows,  $H_{min}$  during the wet season and  $C_{min}$  during the dry season may mimic the natural flow variability observed in Hawaiian streams and support most ecological functions required by the stream animals. Seasonally adjusted flows would also provide maximum water for human use during periods of highest needs in the dry season and provide increased water to the stream animals during the period of lowest demand during the wet season. The increased wet season flows are intended to trigger reproductive events and maximize production of native animals.
- A “share-the-pain” approach in dealing with droughts may be appropriate. When an area is experiencing drought conditions then instream flow requirements may be suspended. The native aquatic animals in Hawaii streams have evolved in a system where droughts and the resultant low flows periodically occur and the animals can repopulate a stream when more favorable conditions return. This is not supportive of the continuous man-made artificial drought conditions currently experienced in many East Maui Streams as a result of stream diversion.

With respect to entrainment of native animals in stream diversions:

- The DAR realizes that complete elimination of entrainment for native stream animals is unlikely, but an avoidance of entrainment at diversion locations is important to maximize populations of native stream animals while minimizing the negative impacts from stream diversions.
- As newly recruiting animals move upstream to adult habitats, they follow the available path of water in the stream. Thus release of water from sluice gates in the immediate vicinity of diversion intakes serves to funnel animals to the intake and results in high rates of entrainment (and ultimately death) of animals migrating upstream. Therefore, water releases should provide a pathway as far away as possible from the point of diversion to minimize entrainment of upstream migrating animals.
- As newly hatched animals travel downstream to the ocean, they passively drift with the stream water. Thus release of water from sluice gates in the immediate vicinity of diversion intakes serves to concentrate animals near the intake and

results in high rates of entrainment (and ultimately death) of animals drifting downstream. Therefore, water releases should provide a pathway as far away as possible from the point of diversion to minimize entrainment of downstream drifting animals.

The following are the flow recommendations for the 8 East Maui Streams (Table 1). The  $H_{min}$  and  $C_{min}$  flow are provided (highlighted in green) along with the USGS  $H_{70}$  (removal of 63% of median base flow for all species less opae and 77% of median base flow for opae) and USGS  $H_{50}$  (removal of 83% of median base flow for all species less opae and >99% of median base flow for opae). The DAR recommendations of  $H_{min}$  and  $C_{min}$  flows represent essential actions that will greatly enhance native species habitat, connectivity, and overall population structure and viability. In no case are additional diversions of stream water recommended.

*Note: DAR has seen little evidence in its surveys across the State of Hawaii that substantial (83%) to nearly complete (>99%) removal of base flow from a stream results in only losing 50% of its animals as suggested by the USGS study and thus does not support the designation of these flow amounts as 70 and 50% of available habitat.*

Table 1. Various level of flow diversion for East Maui streams.

Stream	Average stream flow below lower most diversion BFQ <sub>50</sub> (cfs)	$H_{min}$ : DAR Recommended minimum habitat flow for wet season ( $H_{50}$ from USGS)	USGS $H_{70}$ for all animals less opae (not supported by DAR)	USGS $H_{70}$ for opae (not supported by DAR)	$C_{min}$ : DAR Recommended minimum connectivity flow for dry season	USGS $H_{50}$ for all animals less opae (not supported by DAR)	USGS $H_{50}$ for opae (not supported by DAR)
		Amount of flow (cfs) remaining after diversion of x% of Median Base flow (BFQ <sub>50</sub> )					
		$H_{min}$ : 36%	$H_{70}$ : 63%	$H_{70}$ : 77%	$C_{min}$ : 80%	$H_{50}$ : 83%	$H_{50}$ : 99%
Waikamoi	6.9	4.4	2.5	1.6	1.4	1.2	0.1
Puohokamoa	10.5	6.7	3.9	2.4	2.1	1.8	0.1
Haipuaena	5.2	3.3	1.9	1.2	1.0	0.9	0.1
W. Wailua Iki	7.0	4.5	2.6	1.6	1.4	1.2	0.1
E. Wailua Iki	7.0	4.5	2.6	1.6	1.4	1.2	0.1
Kopiliula	8.0	5.1	3.0	1.8	1.6	1.4	0.1
Waiohue	6.8	4.3	2.5	1.6	1.4	1.1	0.1
Hanawi	no flow restoration recommended only modification of diversion for passage						

We apologize for any confusion created by the lack of clarity surrounding DAR's position on suitable instream flow requirements to support native aquatic animals. We hope this memorandum clarifies DAR's position on the subject. We understand the developing appropriate instream flow standards is a complex and difficult task and hope we can continue to support CWRM by providing well-reasoned scientific information that supports DAR's mandate to protect and manage the living aquatic resources in the waters of the State of Hawaii.

**RICHARD "Dick" MAYER**  
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Kula, Maui, Hawaii 96790

**Occupation: Economics/Geography Professor (Retired: 2001)**  
**Maui Community College — 34 years**  
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**EDUCATION**

**B.A. (Economics): Brandeis University, (Waltham, Mass.), 1963**

**M.A. (International Business / Economic Geography): U. of Washington, 1967**

**Thesis: "Private Foreign Investment: The Costs and Benefits to a Developing Nation and to an Investor"**

**Advanced Work: University of California (Berkeley)**

**University of Hawaii at Manoa**

**Bowling Green University**

**WORK EXPERIENCE (SELECTED)**

**2004 Consultant: Maui County Planning Department – Analysis of County Planning Technical Studies**

**2003 Consultant on Maui Long-Term Care Project – Preparation of Demographic Reports**

**1967 – 2001 Maui Community College, Kahului, Maui, Hawaii, 96732**

**Title: Professor: Economics and Geography, Community Colleges (34 Years)**

**(Tenured since 1971) (Retired with title: Professor Emeritus)**

**1968-1969 Division Chairperson, Liberal Arts**

**1975-1977 Division Chairperson, Social Science/Humanities**

**1985 - 2013 Expert Witness in Economics (at numerous L.U.C. hearings)**

**1963 - 1965 Peace Corps/Nepal: Community Development**

**1970 U. S. Federal Census: Crew Leader on Maui**

**1972 Research Project: Maui County: Analysis of Maui County Employment and Manpower Needs**

**1984 - 1985 Consultant: Financial Planning, State Retirement System**

**COMMUNITY AND PROFESSIONAL ORGANIZATIONS / ACTIVITIES (SELECTED)**

**Maui County: Planning Commission, Member**

**Maui County: Upcountry Community Plan, Citizens Advisory Committee, Vice-Chair**

**Maui Island General Plan Advisory Committee (GPAC), Vice-Chairman**

**SELECTED COMMITTEE WORK (Within University of Hawaii system)**

**UNIVERSITY OF HAWAII SYSTEM LEVEL - COMMITTEES (APPOINTED BY UNIVERSITY PRESIDENT)**

**Hawaii State Open University (H.O.P.E.)**

**University of Hawaii General Education Core Requirements**

**UH Environmental Center: Environmental Impact Statement Review**

**University of Hawaii Academic Affairs Committee**

**COMMUNITY COLLEGE SYSTEM LEVEL - COMMITTEES (APPOINTED BY COM. COL. CHANCELLOR)**

**Community College Master Plan**

**"Directions for the 80's" Committee**

**University Reorganization Committee**

**System-wide Accreditation Committee**

**EXHIBIT E-73**

**MAUI COMMUNITY COLLEGE - COMMITTEE WORK**

**Curriculum Committee**



Budget Committee: Chairperson  
Maui County Educational Needs Assessment Survey  
Faculty Senate Executive Committee: Vice-Chairperson  
Faculty Senate Charter Review Committee: Chairperson

**Moderator for several community forums:** air pollution; geothermal power; Maui's airport needs; etc.  
Moderator for political candidates forums: Mayoral, Maui County Council, and State Legislature  
Akaku Cable-TV: Election night commentator

## **RECOGNITION and AWARDS**

<b>1975 American Lung Association</b>	<b>"Blue Sky Award" for Efforts in Clearing Up Air Pollution</b>
<b>1976 Chamber of Commerce</b>	<b>Outstanding "Young American" Award</b>
<b>1981 + 1989 Maui Community College</b>	<b>Faculty Merit Award</b>
<b>1987 University of Hawai'i Board of Regents</b>	<b>"Excellence in Teaching" Award</b>
<b>1991 Maui Peace Network</b>	<b>Ho'omalulu Peace Award</b>
<b>1996 University of Hawai'i System</b>	<b>"Faculty Service to the Community" Award</b>
<b>1997 + 2001 Maui County Council</b>	<b>2 Resolutions recognizing service to the Maui community</b>
<b>2010 Sierra Club, Maui Chapter</b>	<b>'Onipa'a Award</b>
<b>2010 F.A.C.E. Maui</b>	<b>Community Service Recognition Award Maui County Upcountry Community Plan, Citizen's Advisory Committee, Vice-Chairman</b>

**University of Hawai'i Environmental Center: Environmental Impact Statement Reviewer, Maui**  
**Hawaii Public Utilities Commission: Statewide Integrated Resources Plan Committee**  
**Alliance of Maui Community Associations, Coordinator**  
**County: Board of Adjustments and Appeals, Member**  
**Maui County: Advisory Committee to Mayor on Energy Policy, Chairperson**  
**Kula Community Association, Board of Directors, Vice-Pres. + Committee Chair**  
**Mayor Arakawa's Committee to pick Boards + Commissions Members, Chairman**  
**Maui County Council: Energy Advisory Sub-Committee**  
**Maui Chamber of Commerce: Economic Development Committee**  
**State of Hawaii: Air Pollution Control Committee, Maui County, Chairperson**  
**Hawaii State Statistical Data Center (Agency of DBEDT), Maui County Representative**  
**Maui Economic Development Board: Statistics Committee**  
**Kula Elementary School PTA, Vice-President + President**  
**UH Maui Outreach Program (Established BA & grad programs on Maui), Organizer + first director**  
**King Kekaulike High School, Chair of committee to establish and locate a new public High School**  
**Maui Electric Company: Integrated Resources Plan (I.R.P.) Advisory Committee**  
**Moderator: Numerous Political Candidate Forums**

## ***ACKNOWLEDGMENTS***

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**Alan Arakawa, Mayor**  
**Keith Regan, Managing Director**  
**William Spence, Planning Director**  
**Michele McLean, Deputy Planning Director**

### **COUNTY COUNCIL**

Danny A. Mateo, Chair  
Joseph Pontanilla, Vice-chair  
Gladys Coelho Baisa  
Robert Carroll  
Elle Cochran  
Donald G. Couch, Jr.  
G. Riki Hokama  
Michael P. Victorino  
Mike White

### **MAUI PLANNING COMMISSION**

Wayne Hedani, Chair  
Bruce U'u, Vice-chair  
Donna Domingo  
John Guard, IV  
Kent Hiranaga  
Ward Mardfin  
Lori Sablas  
Warren Shibuya  
Jonathan Starr

### **MAUI GENERAL PLAN ADVISORY COMMITTEE**

Thomas Cannon, Chair	Lisa Hamilton	Warren Shibuya
Dick Mayer, Vice-chair	Kennard Kekona	Jeanne Skog
Joe Bertram III	Carl Lindquist	Warren Suzuki
John Blumer-Buell	Douglas MacCleur	Frank Sylva
Lesley Bruce	Hans Michel	Stacie Thorlakson
Thomas Cook	Susan Moikeha	Trevor Tokishi
Antoinette deNaie	Walette Pellegrino	Mercer Vicens
Kehau Filimoeatu	Hinano Rodrigues	Warren Watanabe
Stanley Franco		

### **PLANNING DEPARTMENT, LONG RANGE DIVISION**

John F. Summers, Planning Program Administrator	Daniel McNulty-Huffman, GIS Supervisor
Joy Paredes, Division Secretary	Mark King, GIS Analyst
David Yamashita, Planner Supervisor	Michael Napier, GIS Analyst
Simone Bosco, Senior Planner	Peter Graves, GIS Analyst
Stanley Solamillo, Senior Planner	Connie Tucker, GIS Technician
Kathleen Kern, Senior Planner	Richele Lesa, Office Operations Assistant
Mary Jorgensen, Senior Planner	

### **CONSULTANT TEAM**

**PRIMARY CONSULTANT**  
PlanPacific, Inc.  
Robin Foster, Vice-President

### **SUB-CONSULTANTS**

Chris Hart & Partners, Inc.  
Chris Hart, President  
Michael Summers, Senior Planner  
David Sereda, Landscape Architect  
Jennifer Maydan, Planner

### **SPECIAL STUDIES**

Fern Tiger & Associates – WalkStory / PlanStory  
John Knox & Associates – Housing / Economy  
Maui Economic Development Board – WalkStory/  
PlanStory  
RM Towill, Inc. – Public Facilities  
SMS Consulting – Socio-Economic Forecast  
Tom Dinell & Associates – Housing / Economy  
Wilson Okamoto & Associates – Infrastructure

## MEMO CONFERENCE

EMI: PAST, PRESENT, AND FUTURE

DEC 14, 1986

Robert L. Warzecha  
Vice President and Manager  
East Maui Irrigation Company

I would like to thank the Maui Economic Development Board and the Maui Chamber of Commerce for giving me this opportunity to tell you the story of the East Maui Irrigation Company. I take great pride in relating the history of our EMI ditch system as it is, in my opinion, Hawaii's most dramatic water story and certainly one of tremendous courage and foresight.

### History

The EMI story begins over 100 years ago in 1876, when Samuel Alexander first conceived of a plan to bring water from the rainy, windward slopes of Haleakala to the dry sugarcane fields in Central Maui. At the time, Samuel Alexander and H. P. Baldwin, the founders of Alexander & Baldwin, were partners in a growing, but struggling, plantation business in Central Maui. A severe water problem threatened to put them out of business. Something had to be done to provide a more reliable and steady source of water to their fields in order for their business to survive.

At the stockholders meeting of the Haiku Sugar Company in August 1876, Samuel Alexander outlined a proposal to construct a ditch to bring the waters of East Maui to his cane fields on the west side of Maliko gulch. His plan was based on a pioneer practice he had seen twenty years earlier, in 1856, on Kauai. There, William Hyde Rice of the Lihue Plantation had just completed the construction of a 10-mile long irrigation ditch—a project which was spurred on by the terrible drought conditions of the previous year.

Alexander's plan called for an investment of \$25,000 and construction time of one year. The stockholders approved his plan and agreed to put up half of the needed funds. In September 1876, a lease was obtained from the kingdom to construct an aqueduct over government lands and collect the waters of East Maui between Honopou and Naliilithaele streams. However, the lease stipulated that the construction of the ditch had to be completed in two years or the lease would lapse and any work done would revert to the government. The lease was granted to a partnership of five plantations who in turn formed the Hamakua Ditch Company in November 1876. The Hamakua Ditch Company was the forerunner of the present East Maui Irrigation Company.

Construction of the ditch progressed very well under the capable leadership of H. P. Baldwin. Baldwin's work crew, which numbered 200 at times, was an unusual lot of people. There wasn't a trained engineer in the group. His superintendent was a carpenter by trade and his overseers were shipwrecked sailors. The remainder of the crew were local people with little or no experience in this type of work. Baldwin

## MAUI WATER AND ENERGY: FUTURE NEEDS AND DIRECTIONS

### Proceedings of a Conference

Cosponsored by

Maui Chamber of Commerce

Maui-Pacific Institute

Subsidiary of the

Maui Economic Development Board, Inc.

Maui Electric Company, Ltd.

December 14, 1986

EXHIBIT E-75

himself was without engineering training and there is no record of his receiving any professional assistance.

Nevertheless, by July 6, 1877, after less than one year of construction, the crew had reached the east side of Maliko gulch. All that was left of the project was to cross the Maliko gulch. However, this is where the real story unfolds. The Maliko gulch was a formidable ravine, 450 feet deep, with very steep sides. Alexander's plan called for the use of a 1,100-foot long 24-inch steel pipe inverted siphon to carry the water across the gulch. The installation of this siphon required the workers to lower themselves over the cliffs on rope, hand over hand, to lay sections of the pipe up and down the precipitous sides of the gulch. At first, the workers refused to go down into the gulch, terrified at the thought of risking falls of hundreds of feet onto the jagged rocks below. To inspire them and give them courage, H. P. Baldwin, who had recently lost an arm in a mill accident, made the first leap and lowered himself, literally single-handed, down the rope and into the gulch. Baldwin repeated this feat day after day to inspect the work and to continually give the workers confidence.

By this time, the Hamakua Ditch Company was racing against the two-year deadline for the completion of the ditch. To add to the stakes, Claus Spreckels, the "Sugar King," had also received a lease from King Kalakaua to construct a ditch and collect waters from Haleakala to Waiuku. Spreckels' lease stated that if the Hamakua Ditch was not completed in time, Spreckels would assume possession of the constructed portion of the Hamakua Ditch.

Baldwin and his team raced against time—and won as you might have guessed—just barely meeting the two-year deadline. The completed Hamakua Ditch was some 17 miles long with a capacity of 60 MGD. In the end, it cost \$80,000 and took two years to complete—substantially more time and more money than Alexander had initially estimated. But this spectacular feat of construction made possible the profitable cultivation of sugar cane in Central Maui. The U.S.-Hawaii Reciprocity Treaty, signed in 1876 at the time of the start of ditch construction, served as the impetus for the expansion of the sugar industry in Hawaii. Additional ditches were constructed in East Maui prior to the turn of the century to accommodate this growth; these consisted of the Haiku, Spreckels, Center, Mannal Luis, and Lowrie Ditches. The new Hamakua, Kaunika, and Koolau Ditches were built before World War I. Finally, the Waihoa Ditch—the largest ditch and last major construction—was completed in 1923.

## Present

Today, the East Maui Irrigation Company is a wholly-owned subsidiary of Alexander & Baldwin, Inc. EMI's purpose is to collect, store, distribute and deliver water to HC&S, the largest sugar plantation in Hawaii and a division of A&B. HC&S cultivates approximately 35,000 acres on Maui and utilizes the EMI water for its irrigation and mill needs. EMI also provides water to Maui Land & Pineapple Company, a few private pineapple growers, and the County of Maui for its upcountry diversified ag and domestic water needs. Furthermore, EMI has an agreement with

the Department of Water Supply whereby we manage the county's Waikamoi collection system.

The system that found its beginnings in a 17-mile ditch with a capacity of 60 MGD today consists of 74 miles of ditch and tunnel, 12 inverted siphons, 8 reservoirs with a total storage capacity of 290 million gallons, and numerous dams, pipes, and flumes. Total delivery capacity is now 450 MGD. In addition, there are 62 miles of private telephone lines connected to 13 telemarks to give instantaneous readings on ditch flows and status of the system.

The EMI system can generally be described as four parallel ditches which collect water through 388 intakes or sources located between Nahiku and Haiku. The ditches bring this water to HC&S's cane fields in Central Maui at four levels of delivery. Although parallel, the ditches do interact so as to efficiently provide the most water at the highest elevation possible through numerous automatic overflow devices.

The EMI system collects water, primarily surface runoff, from a total watershed area of 57,000 acres stretching from Nahiku to Maliko gulch. Nineteen thousand of these acres are owned by EMI with the remaining 38,000 acres owned by the state who leased EMI the right to collect the water off of these East Maui lands. In return, EMI pays the state approximately \$120,000 a year for this right.

The EMI system is continuously maintained and regulated by a small but highly skilled 20-person crew. These dedicated people, who live and work in the ditch country, are the main reason for EMI's success. EMI currently spends \$850,000 a year in maintaining the aqueduct system and auxiliary facilities. Thus, at least \$1 million is spent each year for water fees and system maintenance to insure a secure supply of water to the plantation.

As an aside, unlike many large water projects throughout the U.S., the EMI system has received no government funding—the total cost of water development, system installation, and maintenance has been paid for with private monies.

EMI's average deliveries are about 60 billion gallons of water per year, meeting roughly 55 percent of HC&S's annual irrigation water needs. Even with these deliveries, it is estimated that EMI collects only 15 percent of the total annual rainfall in the watershed area. During periods of high rainfall, the EMI system's delivery capacity of 450 MGD is rapidly filled, and most of the rainfall goes to the ocean. However, during dry periods when the system collects virtually all of the water above the ditches, HC&S is severely short of water. For example, during last year's drought, EMI's deliveries dropped to 10 MGD of which the county was taking roughly 5 to 6 MGD for its upcountry needs. As a result, one-year old cane had to be prematurely harvested due to rot, 2,500 acres were fallowed because there was no water to justify the replanting of the fields, and employees were prematurely laid off. So, as you can see, in the dry periods, the plantation needs every drop of water we can collect. On the average, there is insufficient water 24 percent of the time.

Also incorporated into the EMI ditch system are three hydroelectric plants which utilize the energy of the water, when available, as it drops from one ditch to another to produce power for our mill needs. These facilities will be fully described shortly by Sach Masumoto, our A&B representative.

Thus, the EMI system is an extensive, complex machine with many moving parts—parts which are constantly being regulated so as to provide water to the plantation in the most consistent and efficient way possible. A model in Hawaii, the EMI system is unique in the world. HC&S's expansion and success was made possible by the foresight of its founders in bringing East Maui waters to the central valley. And, after more than a century, the EMI system remains a vital part of Hawaii's largest sugar plantation and an important source of water for the plantation's upcountry neighbors.

#### State Water Code

With the understanding of EMI's courageous beginnings and its growth and evolution into the impressive system it is today, the lifeline of HC&S, I would like to take this opportunity to comment on an issue which is of vital and imminent concern to us—the state water code. Since, as we are talking here today about the importance and role of water in our economy and community and the value that can be extracted from using our water resources flexibly and more efficiently, I think it is appropriate to address the effects the proposed state water code could have on future water usage.

First, let me briefly explain how and why the code came into being. In 1978, Hawaii's Constitution was amended to call for the establishment of a comprehensive water management program "to regulate the use of Hawaii's water resources". In response to this constitutional mandate, the 1982 Legislature enacted Act 170 which created an advisory water commission and charged it with the task of formulating a state water code for Hawaii. The water commission, consisting of both private and public sector representatives, deliberated for two years, submitting their final report to the Legislature last year. The Senate passed an amended version of the commission's code during the 1985 session which now goes before the House of Representatives in 1986 for their consideration.

Because of our vital dependence on water, we have closely monitored the development of the water code from the very beginning. We have participated in all public hearing forums regarding the code and consistently voiced our concerns and comments. Yet, we still find the code following a course that threatens to strip away the basic tenets which EMI, HC&S and, in fact, the entire Hawaiian sugar industry, relied upon when developing their extensive water systems. The water code, as currently drafted, refuses to recognize the very laws and principles which served to support and promote the investment of great sums of money by the private sector in the development of water sources and the construction of transmission systems. Thus, the very laws and principles responsible for much of the economic development of our islands (as all agricultural, commercial, residential, and industrial development is dependant on securing dependable water resources) will be

thrown out—laws and principles which have evolved over the course of hundreds of years of Hawaiian history, the result of ancient customs, laws, rulings, and court decisions.

The water code proposed by the water commission and amended by the Senate is based on the establishment of a restrictive permit system for water usage. We feel that this permit system is an example of over-regulation on the part of the government. It will only serve to make it difficult, if at all possible, to operate efficiently and cost-effectively.

Let me give some specific examples of the effects the proposed code would have on EMI's and HC&S's operations. The code required that permits obtained for water usage are to be source-specific, quantity-specific, use-specific, place of use-specific, and location of well or diversion-specific. Furthermore, any time the use or place of use changes, the quantity of use is increased, or there is "any change...which may have a material effect upon any person or upon the water resource", you lose your permit and must apply for a new one. As I mentioned earlier, the EMI system has many moving parts. Thus, such a rigid system would be an administrative nightmare for us. With 388 sources and 35,000 acres of cane, applications and reapplications for water permits would be a continuous task. We view this as an unnecessary expenditure of managerial time and money that will not provide any added protection to our water resources. Rather, the proposed permit system will serve as a disincentive to creative water conservation and efficiency practices—it will discourage people from altering their water usage patterns because people will be afraid to make changes, no matter how beneficial and cost-efficient the change, for fear of losing their entire water allotment.

Over the past 12 years, HC&S has spent over \$106 million in improvements to its irrigation and factory facilities and expended great human effort in an attempt to remain an economically viable plantation. We have survived these past few difficult sugar years only through the successful implementation of a cost-cutting and efficiency improvement program which addresses all areas of plantation operations including temporary layoffs. The proposed code would endanger our survival by imposing excessive costs and making it difficult to operate cost-efficiently. Furthermore, without a secure supply of water, no amount of cost-cutting can keep us in business. The proposed code strips us of this security by replacing ownership rights to use water with a revocable permit.

We believe that a water code focused primarily on strict regulation will only serve to harm our economy by retarding and delaying needed water development. We believe that the people of Hawaii can only benefit from a code which balances protection, control and regulation with positive incentives for resource conservation and development. Rather than governmental allocation by permit, the sugar industry has been promoting a regulated market approach to water allocation. That is, to let market economics, a system we are all familiar with, determine the best use of water subject to broad policies and guidelines enforced by the government (i.e., setting sustainable yields, protecting against third party impairment, enforcing beneficial use requirements, etc.) Again, this balanced system gives water consumers incentive

to conserve and water suppliers incentive to develop and deliver water more efficiently.

Remember, EMT's aqueduct system dates back to 1876 when, under the encouragement by King Kalakaua, the first ditch was constructed to bring water from East Maui to the central isthmus. From this beginning over a hundred years ago, HC&S has prospered because of the assurance of the use of its water and the ability to utilize this water in the most efficient manner. We submit that a water code for the State of Hawaii must recognize vested water rights and Hawaii's long history of water law developed from monarchy days through statehood to avoid being challenged in court.

Again, thank you for this opportunity to tell you the EMI story.

EXHIBIT A

Agricultural Lands Assessment  
for  
Alexander & Baldwin, Inc.  
Maui Lands

April 2009

Prepared for: Alexander & Baldwin, Inc.  
822 Bishop Street  
Honolulu, Hawaii 96813

Prepared by: PBR Hawaii & Associates, Inc.  
1001 Bishop Street  
ASB Tower, Suite 650  
Honolulu, Hawaii 96813

A=B  
EXHIBIT A

EXHIBIT E-76

## Introduction/Purpose

To support a Petition for Declaratory Order to Designate 'Important Agricultural Lands' ('IAL'), an Agricultural Lands Assessment was prepared for lands owned by Alexander & Baldwin, Inc. and its related companies on Maui.

HRS § 205-44(c) provides the standards and criteria to identify IAL. HRS § 205-44(a) provides that lands identified as IAL need not meet every standard and criteria listed in HRS § 205-44(c); rather, lands meeting any of the criteria in HRS § 205-44(c) shall be given initial consideration, provided that the designation of IAL shall be made by weighing the standards and criteria with each other to meet the constitutionally mandated purposes in article XI, section 3, of the Hawaii Constitution and the objectives and policies for IAL in section 205-42 and 205-43. The standards and criteria of section 205-44(c) are as follows:

- 1) *Land currently used for agricultural production;*
- 2) *Land with soil qualities and growing conditions that support agricultural production of food, fiber, or fuel-and energy-producing crops;*
- 3) *Land identified under agricultural productivity rating systems, such as the agricultural lands of importance to the State of Hawaii (ALISH) system adopted by the board of agriculture on January 28, 1977;*
- 4) *Land types associated with traditional native Hawaiian agricultural uses, such as taro cultivation, or unique agricultural crops and uses, such as coffee, vineyards, aquaculture, and energy production;*
- 5) *Land with sufficient quantities of water to support viable agricultural production;*
- 6) *Land whose designation as important agricultural lands is consistent with general, development and community plans of the county;*
- 7) *Land that contributes to maintaining a critical land mass important to agricultural operation productivity;*
- 8) *Land with or near support infrastructure conducive to agricultural productivity, such as transportation to markets, water or power.*

The following exhibits were prepared to qualify and quantify the agricultural lands being proposed to be designated 'IAL.'

### Figure 1: Existing Cultivated / Farmed Land

Based on the Crop Type Map prepared by Hawaiian Commercial & Sugar Co. (HC&S), the proposed IAL lands are currently utilized for active agricultural purposes. Approximately 87% of the lands are actively used for the cultivation of sugar cane, and 6% are used for the cultivation of seed corn, pineapple, and pasture. The field numbers and the different crop types are shown on the Figure 1. The remaining 7% of the lands are not in cultivation, however are essential elements of the agricultural operations such as gulches and steep slopes which serve a drainage function or other key agricultural infrastructure, such as reservoirs and irrigation distribution infrastructure.



### Figure 2: Agricultural Soils Productivity Ratings

The Detailed Land Classification System and Agricultural Land Productivity Ratings by the Land Study Bureau (LSB), University of Hawaii are based on a five-class productivity rating system using the letters A, B, C, D, and E, with A representing the class of highest productivity and E the lowest. As illustrated in Figure 2, over 70% of the proposed IAL lands are rated A (59%) and B (14%). Approximately 27% are rated C, D, and E. The balance of the proposed IAL lands (less than 1%) not classified by LSB are essential elements of the active agricultural operation (drainage gulches, reservoirs, etc.).

### Figure 3: Solar Radiation

Based on the Sunshine Maps prepared in 1985 by the State Department of Business, Economic Development and Tourism, formerly known as the State Department of Planning and Economic Development, Energy Division, approximately 84% of the proposed IAL lands receive an annual average of 450 calories of solar energy per square centimeter per day.

### Figure 4: Agricultural Lands of Importance to the State of Hawaii (ALISH)

The Agricultural Lands of Importance to the State of Hawaii (ALISH) classification system was developed in 1977 by the State Department of Agriculture. The system is based primarily, but not exclusively, on the soil characteristics of lands. There are three classes of ALISH lands – Prime, Unique, and Other. Approximately 76% of the proposed IAL lands are classified as Prime and 13% as Other. The balance of the proposed IAL lands are farmed and/or include essential elements of the active agricultural operation, such as the gulches and reservoirs, and are not classified under ALISH.

### Figure 5: Agricultural Infrastructure and Water Resources

The Agricultural Infrastructure and Water Resources Map shows that the proposed IAL lands will be served by HC&S' existing irrigation system, consisting of brackish water wells, reservoirs and two surface water ditch systems. All fields within the proposed IAL lands are currently served by a drip irrigation system.

The East Maui Irrigation (EMI) ditch system is owned, operated and maintained by East Maui Irrigation Company, a wholly owned subsidiary of Alexander & Baldwin, Inc. The West Maui Ditch System is co-owned, operated and maintained by HC&S and the Wailuku Water Company, formerly Wailuku Sugar Company. The delivery capacity of the two ditch systems total approximately 570 million gallons per day (EMI system: 450 mgd; West Maui ditch system: 120 mgd). The long-term average water delivery from the two systems is approximately 195 mgd (this includes only the water delivered from the West Maui system used by HC&S, not the total delivery of the system). In addition, HC&S owns and operates 15 brackish water wells with a total pumping capacity of approximately 228 mgd which are used to supplement ditch flows as needed.

The cultivated areas within the proposed 27,133 acres of IAL have been in cultivation for over 100 years and have historically relied upon these water sources to sufficiently meet their irrigation needs.

In addition to the existing wells, reservoirs and irrigation system, the proposed IAL lands also receive an average of 15.8 to 59.1 inches of rain annually. Therefore, the proposed IAL lands have sufficient quantities of water to support viable agricultural production.

#### Figure 6: Maui Island Plan (Draft)

The Draft Maui Island Plan (April 2008) is a part of the County's on-going effort to prepare the General Plan 2030 of the County of Maui. Intended to provide a long-term comprehensive strategic planning document for the physical, economic, environmental development and cultural identity of the county, it encompasses goals, policies, programs and actions that are recommended based on an assessment of current and future needs and available resources.

According to the Land Use Policy Map published in this document, the entire proposed IAL lands are outside the proposed Urban Growth Boundary, Resort Areas, and Developed Areas.

#### Figure 7: Maui Community Plans

As a more detailed land use element of the General Plan, the Community Plans are land use planning documents that guide government action and decision-making for the total of nine community planning districts within the County of Maui. The documents are district specific and include planning goals, objectives, policies and implementation considerations that provide for optimum planning effectiveness and benefits for the residents in the respective community districts.

Three of the Community Plans Land Use Maps are included for assessment of the proposed IAL lands. The proposed IAL lands are designated Agriculture on the 1990 Wailuku-Kahului Community Plan Land Use Map<sup>1</sup> (Figure 7A). The 1998 Kihei-Makena Community Plan Land Use Map also designates the proposed IAL lands as Agriculture, with Waikapu Stream and a few small areas outside Kealia Pond National Wildlife Refuge designated Open Space (Figure 7B). The 1995 Paia-Haiku Community Plan Land Use Map designates the proposed IAL lands as Agriculture (Figure 7C).

#### Figure 8: State Land Use District Boundary Map

Utilizing the official State Land Use District Boundary Maps, the proposed IAL lands are illustrated to confirm that all the proposed IAL lands are within the Agricultural District. Where the proposed IAL lands are contiguous to the Urban District boundary, the proposed IAL boundary follows the Urban District boundary.

---

<sup>1</sup> As amended by Ordinance No. 3061 (Wailuku – Kahului Community Plan 2002), effective June 5, 2002.

**Legend**

Crop Type

- Light
- Prunus
- Sweet Corn
- Pasture/Other
- Presently Important Agricultural Lands

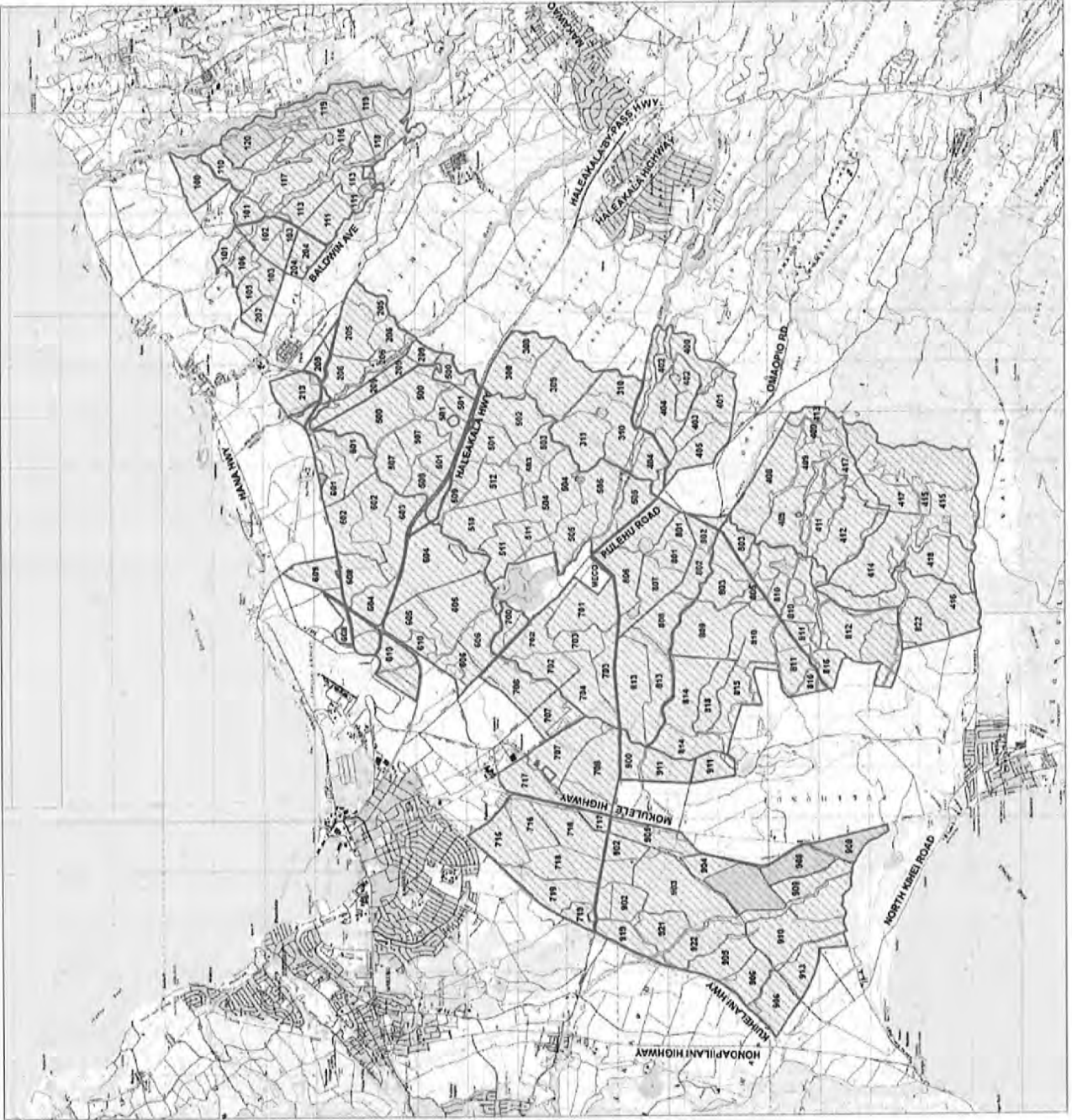


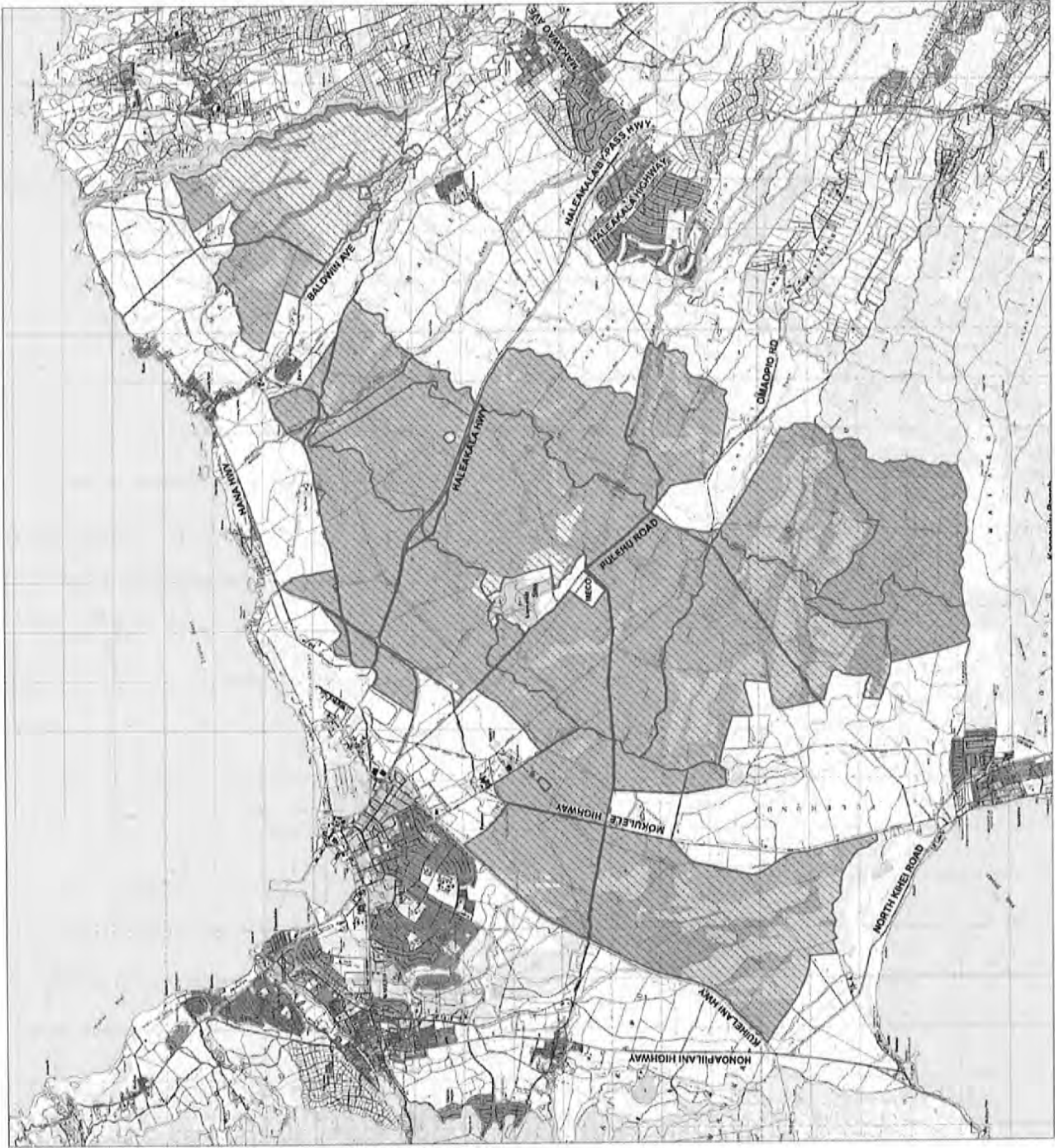
Figure 1  
Existing Cultivated / Farmed Land  
**A&B IAL Maui**

MAUI COUNTY  
PLANNING DEPARTMENT  
MARCH 2020



**Legend**

- Agricultural Soils Productivity Rating**
- A (Excellent)
  - B (Good)
  - C (Fair)
  - D (Very Poor)
  - E (Very Poor)
  - Not Classified
  - Proposed Important Agricultural Lands



Soil Data Source: USDA  
US Department of Energy  
This document is available for download at [www.energy.gov](http://www.energy.gov)

**Figure 2**  
Agricultural Soils Productivity Ratings  
**A&B IAL Maui**

US EIA  
SCALE: 1:50,000  
MAPS  
HONOLULU, HAWAII  
MARCH 2009

**Legend**

Solar Radiation (cal/sq.cm/day)




400  
450  
500

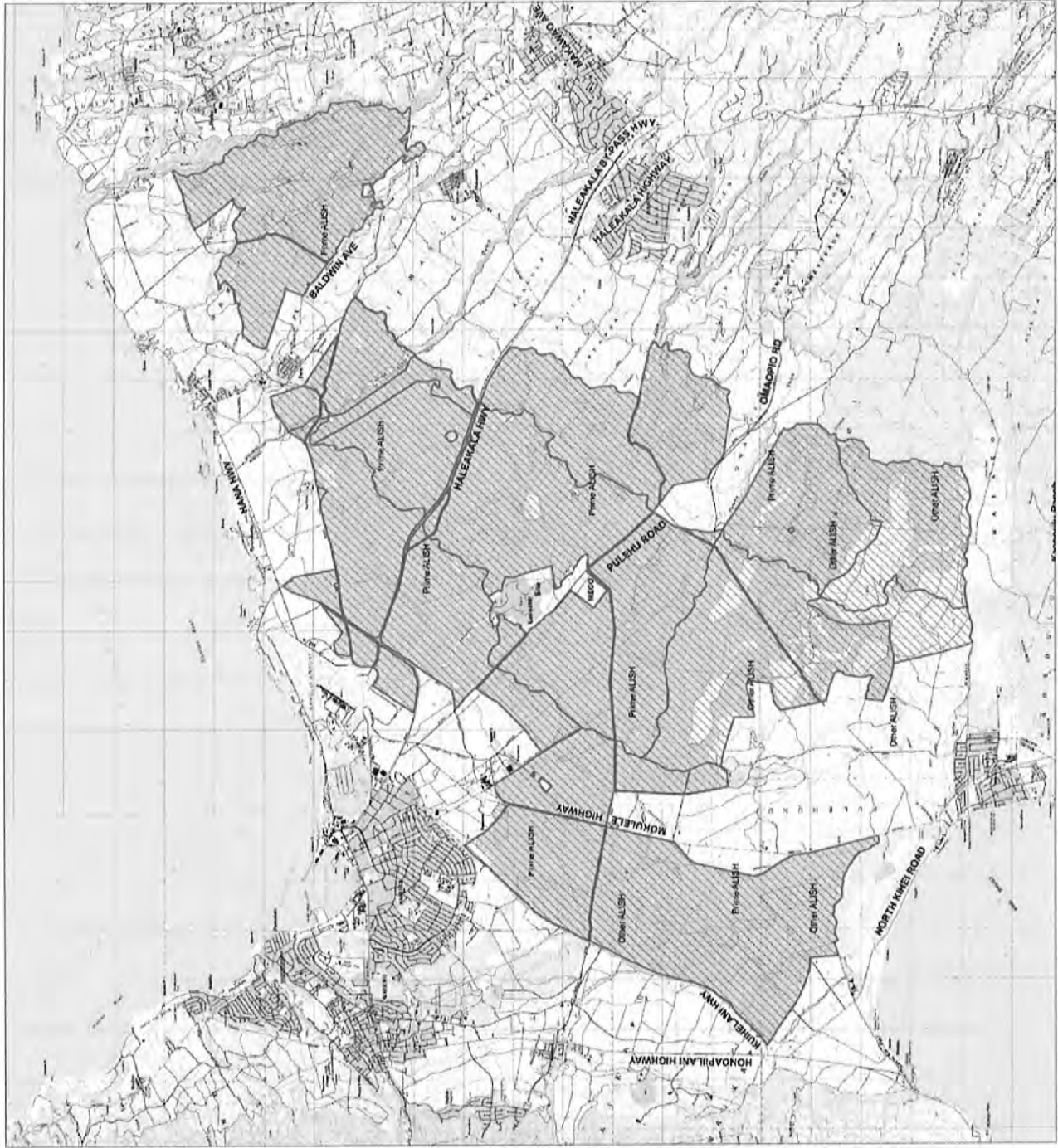
Proposed Important Agricultural Lands



Map  
Data  
Source  
USGS  
Topographic  
Map  
Scale  
1:50,000  
Projection  
NAD 83  
Datum  
NAD 83  
Units  
Feet  
Date  
2005

**Legend**

-  Prime AULSH Lands
-  Other AULSH Lands
-  Proposed Important Agricultural Lands



MAUI  
STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
2006

**Figure-4**  
Agricultural Lands of Importance to the State of  
Hawaii (AULSH)






**A&B IAL Maui**

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
2006



March 2006

**Legend**

-  Served by the Effi Ditch System
-  Served by the West Maui Ditch System
-  Well Locations
-  Annual Rainfall
-  Proposed Important Agricultural Lands



Maui Water Commission, Project 20  
 U.S. Customary Units  
 This document is prepared for general planning purposes only.

**Figure 5**  
 Agricultural Infrastructure / Water Resources  
**A&B IAL Maui**

1000' 1" = 1000' FEET  
 1:50,000  
  
 DEPARTMENT OF WATER RESOURCES  
 HONOLULU, HAWAII

- Legend**
- Urban Growth Boundary
  - Recent Areas
  - Developed
  - Sensitive Lands
  - Proposed Important-Agricultural Lands



Source: County of Maui, Total Land Use Data (2002).  
 Data were compiled for general planning purposes only.

**Figure 6**  
 Maui Island Plan (Draft) Land Use Policy Map  
**A&B IAL Maui**


  
 COUNTY OF MAUI  
 DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT  
 1100 S. MOA AVENUE  
 MAUI, HAWAII 96753  
 PHONE: (808) 243-3100  
 FAX: (808) 243-3101  
 WWW: www.co.maui.hi.gov  
 MARCH 2009





**Figure 7A**  
**Wailuku-Kahului Community Plan Land Use Map**  
**A&B IAL Maui**

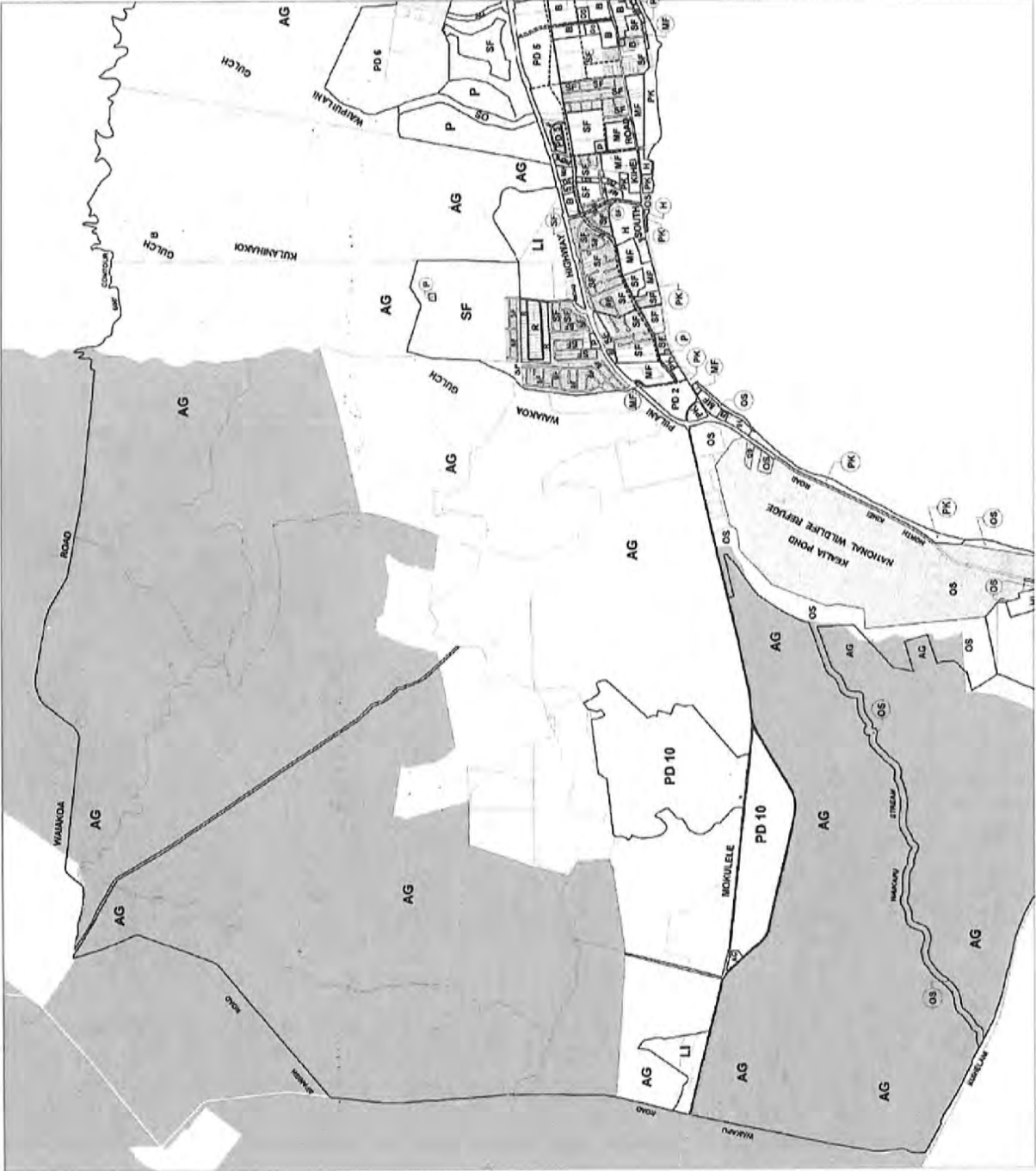
PLANNING DEPARTMENT  
 MAUI COUNTY, HAWAII  
 MARCH 2009

- Legend**
- (A) Agriculture
  - (B) Rural
  - (C) Family Residential
  - (D) Multi-Family Residential
  - (E) Business/Commercial
  - (F) Business/Multi-Family
  - (G) Light Industrial
  - (H) Heavy Industrial
  - (I) Hotel
  - (J) Public/Quasi-Public
  - (K) Open Space
  - (L) Project District
  - (M) Airport
  - (N) Conservation
  - (O) State/County
  - (P) Residential
- Proposed Important Agricultural Lands

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 This map is a reproduction of the original planning department map.

**Legend**

AG	Agriculture
R	Rural
SF	Single Family Residential
MF	Multi-Family Residential
BR	Business/Residential
BI	Business/Industrial
LI	Light Industrial
HI	Heavy Industrial
P	Public
PK	Park
OS	Open Space
PD	Project District
CO	Community
CB	Community Business
SR	Service Residential
SA	Special Agricultural



City of Maui, Maui County, Hawaii  
 Ordinance No. 2007-01 (Maui County Community Plan 2023) effective June 3, 2007  
 This and all other maps are subject to the provisions of the Maui County Ordinance No. 2007-01.

Figure 7B  
 Kihikihi-Makona Community Plan Land Use Map

**A&B IAL Maui**

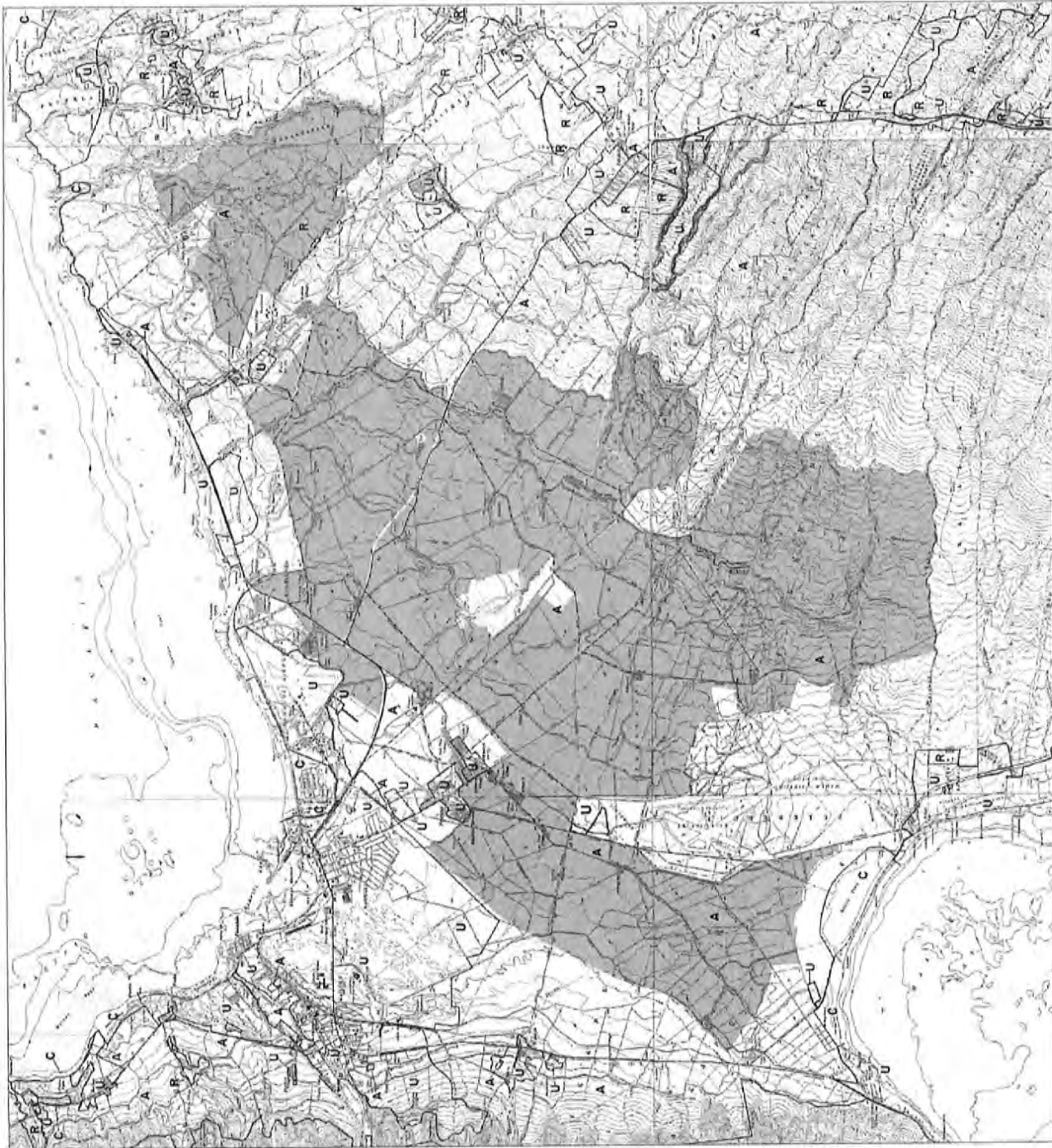


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 MARCH 2009



**Legend**

Proposed Interstate Agricultural Lands



Source:  
State of Hawaii, Department of Land and Natural Resources  
This map was prepared by a private contractor.

**Figure 8**  
State Land Use

**A&B IAL Maui**

SCALE: 1:100,000  
DATE: 1/10/2000  
PROJECT: IAL MAUI  
DRAWN BY: [unintelligible]  
CHECKED BY: [unintelligible]  
APPROVED BY: [unintelligible]  
DATE: 1/10/2000





OPEN HC&S DITCH SYSTEM  
IN CANE FIELDS —  
LOTS OF OPPORTUNITYS FOR  
WATER LOSS

EXHIBIT **E-77-B**



EXHIBIT E-77 A

a belt of persistent clouds and rain (right). The map at right shows the Kona rainfall belt as a narrow, yellow strip upslope of the Kona coast. This zone is home to the farms that produce world-famous Kona coffee. Uplift is enhanced in the afternoons when the sun warms these slopes. Strong trade winds and intense heating during the summer also increase lifting, clouds, and rainfall on the Kona slopes. As a result, this is the only area in Hawai'i with an afternoon rainfall peak, and with more rain in the summer than other seasons (see mean monthly rainfall at Kona station Honaunau, right).

### Changes in Hawai'i Rainfall

The maps comprising the 2011 Rainfall Atlas of Hawai'i depict average rainfall for the 30-year period ending in 2007. This gives an up-to-date picture of normal rainfall amounts and patterns. But, we must be aware that rainfall varies over time. For example, we have strong evidence that rainfall in Hawai'i is affected on a year-to-year time scale by the occurrence of El Niños and La Niñas. These events are part of a large-scale interaction between the ocean and atmosphere centered in the equatorial Pacific, known as El Niño-Southern Oscillation (ENSO). In particular, El Niño is consistently associated with lower than normal rainfall during winter months in Hawai'i. Because Hawai'i is relatively close to the center of action of ENSO, its effects are strong here. El Niños and La Niñas recur on average about every 3 to 7 years. This gives rise to large year-to-year variability in rainfall in Hawai'i.

Another, perhaps less familiar ocean-atmosphere interaction, known as the Pacific Decadal Oscillation (PDO), also exerts a strong influence on Hawai'i rainfall. The PDO is somewhat similar to ENSO, but varies much more slowly, with each phase lasting up to 30 years. During most of the base period for the 2011 Hawai'i Rainfall Atlas of Hawai'i (1978-2007), the PDO was in its positive phase, which is generally associated with lower rainfall in Hawai'i.

In addition to natural variations in rainfall, we are now aware of long-term trends that might be caused by global warming. Over the past 90-100 years, while the effects of ENSO and PDO caused large ups and downs, rainfall in Hawai'i has slowly declined overall. This decline has been especially apparent during recent decades, in part, because it coincides with the low rainfall phase of the PDO. However, the rainfall record and other evidence point to a downward trend in mean rainfall that may persist at least through the end of this century. One possible explanation for the decline has to do with the weather disturbances that regularly disrupt the trade wind inversion and produce widespread rainfall over the islands. These disturbances, often associated with incursions of mid-latitude weather systems into the Hawai'i region during winter, have declined in frequency, as storm tracks have apparently migrated northward. This shift in storm tracks is thought to be a result of global warming and is predicted to continue. If these predictions are borne out, we will continue to see ups and downs in rainfall in the future related to ENSO and PDO, but mean rainfall will decline, and drought will become more frequent.

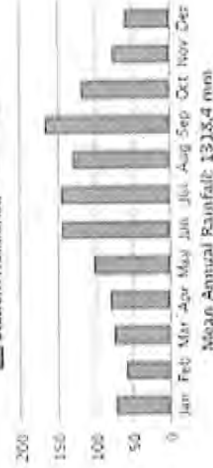
In the Kona coffee growing region of the Island of Hawai'i, some stations have experienced dramatic rainfall declines since the early 1980s. Many believe that this change can be traced to the effects of the eruption of Kilauea Volcano, which has been in its current active phase since 1983. A plume of aerosol-rich volcanic smog ("vog") streams downwind of Kilauea and makes its way around the southern flanks of Mauna Loa and up through the South Kona District. The vog has been a chronic nuisance to the Kona area since the start of the current eruptive phase. The particulates forming the vog can act as cloud condensation nuclei (CCN), helping to produce more cloud droplets. Hence, the areas within the plume may experience greater cloudiness. However, this does not necessarily translate to more rainfall. In fact, it is likely that it is having the opposite effect. With an overabundance of CCN, the water condensed in rising, cooling air is divided into a greater number of droplets. As a result, these droplets are too small to fall as rain and fewer of them are able to grow to a sufficient size to eventually become raindrops.



Mean Monthly Rainfall (mm)

Rainfall Atlas of Hawai'i 2011, University of Hawaii

Station: Honaunau



LOW-FLOW FREQUENCY AND STOCHASTIC ANALYSIS OF  
IRRIGATION DITCH FLOWS FOR CENTRAL MAUI, HAWAII  
FINAL REPORT

by  
Yu-Si Fok  
Clyde S. Miyasato

Technical Report No. 99

November 1976

Project Completion Report  
for

DROUGHT FREQUENCIES FOR SELECTED AREAS IN HAWAII

OWRT Project No. A-055-HI  
Grant Agreement No.: 14-31-0001-5011  
Principal Investigator: Yu-Si Fok  
Project Period: 1 December 1974 to 30 November 1975

The programs and activities described herein were supported in part by funds by the United States Department of the Interior as authorized under the Water Resources Act of 1964, Public Law 88-379; and the Water Resources Center, University of Hawaii.

EXHIBIT E-79



## INTRODUCTION

From 1971 to 1975, Maui, the second largest island of the state of Hawaii, experienced extensive drought damage in its central area. In the severe summer drought of 1973 in particular, the Maui Department of Water Supply was forced to take the emergency action of rationing and trucking water for domestic use to the drought-affected agricultural communities of Kula, Olinda, Makawao, Pukalani, Pe'ahi, and 'Ulupalakua.

A more serious consequence was the severe losses of important vegetable crops due to the irrigation water shortage. During the summer of 1973, Hawaiian Commercial and Sugar Company in Puunene, the largest sugar plantation in Hawaii, reported that 3,561 ha (8,800 acres) planted in sugarcane along the lower slopes of Haleakala were in real danger of dying (Rho 1974). In 1973, this company suffered an overall loss of 9% in sugar production, i.e., a loss of 16,780,000 kg (18,500 tons) of sugar. This loss was the direct result of the nearly 72% reduction of the irrigation water supply (diverted from East Maui to the sugarcane fields) which normally has a flow rate of 492,050 m<sup>3</sup>/day (130 mgd). But during the 1973 drought, for a period of more than a month, only 136,260 m<sup>3</sup>/day (36 mgd) of water was delivered.

A study of droughts on Maui was initiated in 1974 by Fok and Miyasato (1975) to investigate the drought frequencies and possible implication on water resources management in the drought-affected areas on Maui. A set of low-flow frequency curves for the central Maui region was obtained. Since low-flow frequency curves can only provide the probability of occurrence of a drought in terms of a given magnitude, duration, and recurrence interval, their applicability is limited to an event basis. In other words, the probability of a given low-flow can be obtained from a low-flow frequency curve; however, the sequential occurrence pattern of the low-flows cannot be obtained.

This study was conducted to examine the occurrence of drought on an event-sequence basis, using a stochastic analysis of the summer low-flows in central Maui. The methods applied and the results obtained are presented in this report.

## GENERAL RAINFALL DISTRIBUTION ON MAUI

In general, the predominant northeasterly trade winds and the terrain influence the characteristics of climate in the Hawaiian Islands. Moisture-laden air carried inland from the sea by the trade winds is deflected upward by the higher mountains, resulting in cooling and condensation, and is precipitated as rain. If the Hawaiian Islands did not exist, the average annual rainfall where the islands lie would be about 63.5 cm (25 in.). Instead, the actual annual average is about 177.8 cm (70 in.).

In the study of the water resources of central Maui, the predominant parameter of climatology is the distribution of rainfall in Maui. It is recognized that steep rainfall gradients are exhibited in all the Hawaiian Islands and that Maui is not an exception. As a result of steep rainfall gradients, wide variations of water supply problems are not uncommon. In order to give a general picture of rainfall, a map showing the median annual rainfall distribution in Maui according to Taliaferro (1959) is shown in Figure 1.

Figure 1 also shows sugarcane fields located on the island's isthmus where the median annual rainfall is 88.9 cm (35 in.), whereas the windward side of northeastern Maui where water is abundant for water resources development, has a median annual rainfall of more than 381 cm (150 in.). These variations of rainfall distribution make irrigation necessary for sugarcane plantations in central Maui.

## BACKGROUND OF WATER RESOURCES DEVELOPMENT FOR IRRIGATION IN CENTRAL MAUI

The largest water resources development of Maui was the construction of a major ditch system to transport water for irrigation from the wet rain forest lands of the eastern and windward slopes of East Maui (Haleakala) to the sugarcane fields. According to Rho (1974, pp. 8-17), the first ditch, the Hamakua ditch which is 27.36 km (17 miles) long with a capacity of 227,100 m<sup>3</sup>/day (60 mgd), was completed in 1878. Other ditches were added later to the Hamakua ditch system: the Haiku, Spreckels, Center, Manuel Luis, and Lowrie ditches which were constructed before the turn of the century. The New Hamakua, Kauhikoa and Koolau ditches were completed before



World <sup>War</sup> ~~Water~~ I and the last major construction was the completion in 1923 of the Wailoa ditch. A map showing the general location of the ditch system is shown in Figure 2.

Initially, the various plantations shared the use of the water diverted from East Maui, this being proportional to their share of the construction costs of the ditch-tunnel water transportation system. Later the East Maui Irrigation Company (EMI) was founded to manage this vast irrigation ditch-tunnel system. Since then, the EMI has been developing and diverting water from watersheds in East Maui, 70% of which is state lands and 30% owned by EMI. In ensuing years, both the plantations and their waters were consolidated through a series of mergers. Finally in 1948, Hawaiian Commercial & Sugar Company (HC&S, a division of Alexander & Baldwin, Inc. and the largest plantation in Hawaii) became the sole plantation and, therefore, the principal user of the East Maui water. According to Rho (1974, pp. 14-20), the EMI system today includes 119 km (74 miles) of ditches and tunnels with a capacity of 1,722,175 m<sup>3</sup>/day (455 mgd) and there are also 8 reservoirs that can store 1,097,650 m<sup>3</sup> (290 mil gal). Generally the EMI system collects and transports all the water available during the dry seasons; however, during the wet seasons excess stream water is allowed to flow into the ocean.

On an average annual basis, the EMI system collects 15% of the annual rainfall from the 23,066-ha (57,000-acres) East Maui watersheds. In an average summer (June to September dry season), EMI delivers about 68,130,000 m<sup>3</sup> (18 bil gal) of water, but drought drastically affects the actual amount of water delivered, for during the 1973 drought only 37,850,000 m<sup>3</sup> (10 bil gal) was supplied for the same 4-mo period. The EMI system supplies more than 50% of the irrigation water to all the HC&S sugarcane fields of more than 12,950 ha (32,000 acres), which use 126 bil gal/yr (Rho 1974, p. 13), while 45% is obtained from mountain sources and 15 deep wells and pumping stations owned by HC&S and 5% contributed by the West Maui system. In addition, there are many small reservoirs in the HC&S sugarcane fields; however, due to the steep slopes and rugged terrain, the total storage capacity of these reservoirs is about 4,049,950 m<sup>3</sup> (1.07 bil gal). (Reservoirs are used mainly for overnight storage; stored water will be used for irrigation the next day.)

# WAI'ALE

FINAL ENVIRONMENTAL IMPACT STATEMENT

VOLUME 1 OF 2

PREPARED BY:



PBR HAWAII  
& ASSOCIATES, INC.

OCTOBER 2011

**EXHIBIT** E-80

top of the groundwater lens is approximately four feet above msl and consists of drinking quality water. The aquifer has not been designated a ground water management area.

Within and in the nearby vicinity of the property, there are several drinking quality groundwater wells. Wai'ale Well No. 1 (State No. 5129-04) and Wai'ale Well No. 2 (State No. 5129-05) are situated within the northeastern portion of the property. Two other small capacity drinking quality wells are located outside the property near East Waiko Road: Consolidated Baseyards (State Nos. 5129-02 and 03). North of the property within the Maui Lani development are Maui Lani Wells 5, 6, and 7 (State Nos. 5229-04, 05, and 06) which have been turned over to the County Department of Water Supply (DWS) for drinking quality water use.

The CWRM's Water Resource Protection Plan notes a sustainable yield of 1 million gallons per day (MGD) for the Kahului Aquifer, commenting specifically that this "Sustainable Yield ignores significant importation of surface water into Kahului from outside the aquifer system area. This explains the ability to withdraw fresh water from the aquifer at significantly higher rates than the sustainable yield without apparent negative impacts (i.e. rising chloride concentrations or decreasing water levels)" ~~The State Commission on Water Resource Management (CWRM) has set the sustainable yield of the Kahului Aquifer at 1.0 million gallons per day (MGD) based on its estimate that approximately 20 percent of the rainfall directly on the 9.5-square mile area becomes recharged to the underlying groundwater and that 44 percent of this recharge can be safely pumped by wells. As mentioned above, this sustainable yield estimate, however, reflects natural recharge, i.e., rainfall only. As discussed below, the Kahului Aquifer is also fed by other sources and has long yielded significant amounts of brackish water far in excess of this sustainable yield figure. The aquifer has a long history of substantial pumpage of brackish water by HC&S for sugarcane irrigation. In more recent years, the pumpage has been reduced to the range of 25 MGD.~~

The Kahului Aquifer is recharged by several other sources of substantially greater magnitude other than rainfall. These include: 1) underflow from Haleakalā, which passes through the Pā'ia Aquifer into the Kahului Aquifer with no known hydrological impediment, 2) underflow from the West Maui Mountains (Mauna Kahalawai), which moves into the Kahului Aquifer through the weathered surface and alluvium of the mountains, 3) irrigation return flow from sugarcane fields and other agricultural activities, and 4) leakage from the Wai'ale Reservoir. Another contributor in the vicinity is irrigation return flow from the nearby golf course (The Dunes at Maui Lani). In examining these contributing sources of groundwater recharge, it should be noted that any future reductions due to reduced irrigation return flow from agricultural activities would be offset by less pumpage from the aquifer for agricultural irrigation.

The development of new groundwater sources from the 'Īao Aquifer system is not planned for the Wai'ale project. The 'Īao Aquifer system has been designated a State groundwater management area and as such is under the management of the CWRM. The CWRM regulates water withdrawals through a water use permit process. The sustainable yield of

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# Comparison Map Current (2010) HC&S Ag Lands and Lands Committed to Future Ag as IAL.

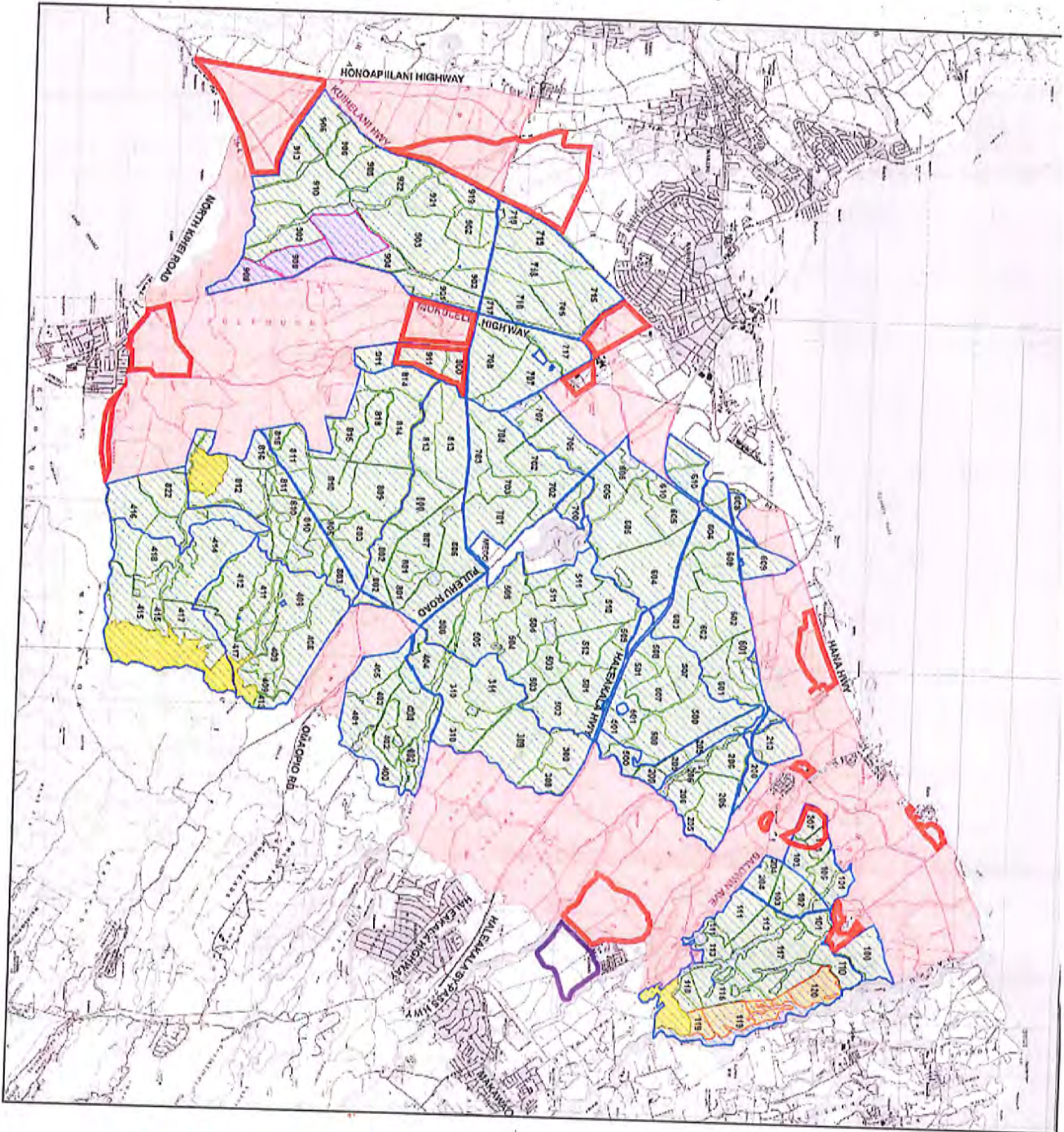
Current HC&S Lands in Ag Production:  
35,000 Acres

HC&S Lands Designated as Important Ag Lands  
2009 by LUC:  
27,133 Acres

Current Water Use for 35,000 Acres from East  
Maui Sources 160mgd

- Legend**
- Crop Type
    - Sugar
    - Pineapple
    - Seed Corn
    - Pasture/ Other
  - Proposed Important Agricultural Lands
  - Existing HC&S Crop Lands not in IAL Boundary
  - Development Areas Proposed During Maui Island Plan Process by A&B Inc. (Approx. 3,000 Acres)
  - Proposed MLP Development Area

Map Source: HC&S IAL Application to LUC  
Composite Map Provided by Maui Tomorrow May 2010





For a further discussion about our business developments in 2013, see “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” in Item 7 of this annual report.

**Description of Business**

*Real Estate*

Our Real Estate segment includes all land planning, entitlement, development and sales activities of our landholdings on Maui. Our principal real estate development is the Kapalua Resort, a master-planned, destination resort community located in West Maui encompassing approximately 3,000 acres. A summary of our landholdings as of December 31, 2013 follows:

	West Maui	Upcountry Maui	Total
Fully entitled urban . . . . .	1,200		1,200
Agricultural zoned . . . . .	8,300	2,000	10,300
Conservation/watershed . . . . .	11,800		11,800
	<u>21,300</u>	<u>2,000</u>	<u>23,300</u>

*Real Estate Planning and Entitlements*—Appropriate entitlements must be obtained for land that is intended for development. Securing proper land entitlement is a process that requires obtaining county, state and federal approvals, which can take many years to complete and entails a variety of risks. The entitlement process requires that we satisfy all conditions and restrictions imposed in connection with such governmental approvals, including, among other things, construction of infrastructure improvements, payment of impact fees—for conditions such as parks and traffic mitigation—restrictions on permitted uses of the land, and provision of affordable housing. We actively work with the community, regulatory agencies, and legislative bodies at all levels of government in an effort to obtain necessary entitlements consistent with the needs of the community.

We have approximately 1,500 acres of land in Maui that are in various stages of the development process. The breakdown of these acres is as follows:

Location	Number of Acres	Zoned for Planned Use	Anticipated Completion Dates	Deferred Development Costs (millions)	Projected Costs to Complete (millions)
Kapalua Resort . . . . .	900	Yes	2019 - 2039	\$7.0	\$500 - \$1,000
Pulelehua . . . . .	300	Yes	2019 - 2024	\$0.6	\$200 - \$300
Hali’imaile . . . . .	300	No	2029 - 2034	\$0.1	\$100 - \$200

We are engaged in planning, permitting and entitlement activities for our development projects, and we intend to proceed with construction and sales of the following projects, among others, when internal and external factors permit:

- *Kapalua Resort*: We began development of the Kapalua Resort in the early 1970’s. Today, the Kapalua Resort has become known as an internationally recognized world-class golf resort destination and residential community. We presently have entitlements to develop a variety of projects in the Kapalua Resort. Two that are currently planned include Kapalua Mauka and Kapalua Central Resort.

Kapalua Mauka is the long-planned expansion of the Kapalua Resort located directly upslope of the existing resort development. As presently planned, it encompasses 800 acres and includes up to 639 residential units with extensive amenities, including up to 27 additional holes of golf. State and County land use entitlements have been secured for this project.

Kapalua Central Resort is a commercial town center and residential community located in the core of the Kapalua Resort. It is comprised of 46 acres and is planned to include up to 61,000 square feet of commercial space and 188 condominium and multi-family residential units. State and County land use entitlements have been secured for this project.

- *Pulelehua*: This project is designed to be a new working-class community in West Maui. It encompasses 312 acres and is currently planned to include 882 single and multi-family residences, 95,000 square feet of commercial and retail spaces, an elementary school, churches and a community center. State and County land use entitlements have been secured for this project.
- *Hali'imaile Town*: An expansion of the existing plantation town in Upcountry Maui, this project is contemplated to be a holistic traditional community with agriculture and sustainability as core design elements. The project includes 290 acres designated as urban "Small Town" in the Maui county's general plan. We are in the early stages of this project's development, which will require further county and state approvals which are expected to take several years.

Projected development costs are expected to be financed by debt financing, through joint ventures with other development or construction companies, or a combination of these methods.

*Real Estate Sales*—Our wholly-owned subsidiary, Kapalua Realty Company, Ltd. provides general brokerage services for resales of properties in the Kapalua Resort and surrounding areas.

Revenues from our Real Estate segment totaled \$5.4 million, or approximately 36% of total operating revenues for the year ended December 31, 2013.

The price and market for luxury and other real estate in Maui is highly cyclical based principally upon interest rates, the general real estate markets in the mainland United States and specifically the West Coast, the popularity of Hawaii as a vacation destination and second-home market, the general condition of the economy in the United States and Asia, and the relationship of the dollar to foreign currencies. Our real estate business faces substantial competition from other land developers on the island of Maui, as well as in other parts of Hawaii and the mainland United States.

### *Leasing*

Our Leasing segment activities include commercial, light industrial and agricultural land leases, licensing of our registered trademarks and trade names, and stewardship and conservation efforts.

*Commercial and Industrial Leases*—We are the owner and lessor of approximately 290,000 square feet of commercial retail and light industrial properties, including the majority of the restaurants and retail outlets, buildings and activities in the Kapalua Resort. The following summarizes information related to our building leases as of December 31, 2013, including the total square footage of all properties held for lease, the average occupancy of such properties and the range of lease expiration dates for the various properties within each area of Maui in which we hold properties for lease:

	<u>Total Square Footage</u>	<u>Average Occupancy Percentage</u>	<u>Lease Expiration Range</u>
Kapalua Resort . . . . .	103,414	79%	2014 - 2028
Hali'imaile Town . . . . .	119,095	88%	2014 - 2029
Other West Maui . . . . .	66,185	38%	2015 - 2019

*Agricultural Leases*—We are the lessor of 1,900 acres of diversified agriculture land leases in West and Upcountry Maui.

HAWAIIAN COMMERCIAL & SUGAR COMPANY (HC&S)\*  
AGRICULTURAL WATER USE

The Hawaiian Commercial & Sugar Company (HC&S) cultivates sugarcane on over 35,800 acres in Central Maui. Our total annual water needs, which are satisfied by a combination of surface and ground waters, approximate 130 billion gallons. On the average, the plantation's irrigation needs are met 55% by surface water and 45% by ground water.

An adequate supply of irrigation water is an ever-present concern of the plantation due to the seasonal fluctuations in surface supplies over the high cost and limited use of pumped ground water. Over the years, HC&S has expended substantial effort and substantial sums of money to insure that available water resources are used as efficiently as possible. All of HC&S' cane land is now equipped with drip irrigation except for 1,600 acres which utilize the excess mill water for irrigation, a project which took eleven years and over \$35 million to complete. Prior to the installation of drip, the plantation implemented a water "development" program which focused on "developing" water through water conservation. All the plantation's major supply and distribution ditches were concrete-lined, selected reservoirs were lined, reservoir capacity increased, irrigation layouts improved, flume outlets improved, and experiments with overhead sprinklers undertaken.

\*This section from A&B, Inc.

Efficient water management continues to be a critical issue for HC&S today, a key item in the plantation's strategy for survival.

#### Surface Water

Surface waters are imported to the plantation from East Maui and West Maui streams through extensive and complex plantation ditch systems.

HC&S' East Maui Irrigation (EMI) system is a network of four major ditches which operate in parallel to collect water from some 100 East Maui streams located between Nahiku and Haiku. The EMI system consists of 74 miles of ditch and tunnel and collects surface runoff from a watershed area of 57,000 acres, 38,000 acres of which are state-owned and 19,000 acres owned by EMI. EMI for over the past 100 years has operated continuously under agreements with the government to collect waters off of the government-owned lands.

EMI's average deliveries are approximately 60 billion gallons a year, or an average of 164 MGD. Actual daily flows, however, vary greatly throughout the year depending on rainfall conditions. During periods of high rainfall, the capacity of the EMI system (450 MGD) is rapidly filled and most of the rainfall flows to the ocean. During periods of low rainfall, HC&S is severely short of water. Flows as low as 10 MGD have been experienced. Our records indicate that there is insufficient water to meet HC&S' irrigation needs 24% of the time, or roughly 90 days a year.

The water provided by the East Maui watershed is absolutely essential to the viability of HC&S. HC&S has 10,000 acres of cane land dependent entirely on East Maui ditch flows for irrigation. In addition, the EMI system provides essential water to the County of Maui for the domestic and agricultural needs of their Upcountry Maui consumers, some 21,000 residents and farmers, and to some private pineapple growers.

The West Maui ditch system is owned and utilized by HC&S in conjunction with Wailuku Agribusiness Company, Inc. This Waihee system provides HC&S with an average of 25 MGD for its western fields. This enables HC&S to utilize more of its East Maui waters for those 10,000 acres totally dependent on the EMI ditch system (shown in Page R-7).

#### Ground Water

The plantation utilizes 16 ground water wells to supplement its rainfall-dependent surface water sources (shown in Page R-8). These wells are capable of supplying a total of 254 MGD. However, in addition to being very expensive to pump, this water is limited in use due to the low elevation locations of the wells and the salt content of the water. During low rainfall periods, HC&S will pump these costly wells in order to keep the cane alive. Actual use, therefore, varies from year-to-year depending on rainfall conditions.

### Other Water Facilities

Other plantation water facilities include 47 reservoirs scattered throughout the plantation with a total storage capacity of 1.065 billion. There are also three hydro-electric plants incorporated into the EMI ditch system which utilize the energy of the water, when available, as it drops from one ditch to another. This power is utilized by our mills and is also sold to Maui Electric.. Priority use of the water, however, is for the irrigation of HC&S' cane lands.

### Conclusion

Despite the capability of the plantation's water systems and water infrastructure to handle large quantities of water, it is important to realize that water shortages are common at HC&S. HC&S is continually looking at means of utilizing water more efficiently and stabilizing its water supplies.

PRIVATE - AGRICULTURAL WATER SYSTEM  
 HC&S CO. - A&B, INC.\*  
 INVENTORY OF EXISTING SOURCES

Aquifer Sector

Surface Water Sources	Koolau	Wailoa Ditch System
	Koolau	Kauhikoa Ditch System
	Koolau	Lowrie Ditch System
	Koolau	Haiku Ditch System
	Wailuku	Waihee Ditch System

	<u>DLNR Well No.</u>	<u>Well - Pump *</u>	<u>Number of Pumps</u>
	5520-01	Maliko Pump 11	2
	5522-01	Kuau Pump 12	1
	5423-02	Lower Paia Pump 16	2
	5422-01	Paia Pump 13	2
	5422-02	Paia Pump 17	1
	5424-01	Spreckelsville Pump 4	1
	5323-01	Paia Pump 2	2
	5224-02	Puunene Pump 9	1
Ground Water Sources	5226-01	Puunene Pump 5	1
	5226-02	Puunene Pump 6	2
	5128-02	Waikapu SH Pump F	2
	5321-01	Kaheka Pump 18	2
	5227-04	Puunene Pump 8	3
	5227-05	Puunene Pump 19	2
	4825-01	Puunene Pump 3	2
	4727-01	Puunene Pump 1	1

\*Surface water sources shown in Page R-7 and ground water sources shown in Page R-8.

\*All wells within Central Sector Aquifer.





# MAUI GOLD

*The Gold Standard of Pineapple*



Home About Maui Gold® Tips & Facts Stores Shop Online Contact Us

## DID YOU KNOW?

Pineapple does not need to be yellow to be ripe. We pick our pineapple when it is ripe.

## TAKE A TOUR

For information about our Maui Gold Pineapple Tour please go to our web site [MauiPineappleTour.com](http://MauiPineappleTour.com) or call for reservations **(808) 665-5491.**

## PINEAPPLE WINE

Maui's Winery at

## ABOUT MAUI GOLD® PINEAPPLE

### Who grows Maui Gold®?

Maui Gold® is grown exclusively by Maui Gold Pineapple Company. Locally owned and operated, Maui Gold Pineapple Company was created by former Maui Pineapple Company employees who were committed to saving the 100 year tradition of pineapple on Maui. As skilled local farmers, we have been cultivating the Maui Gold® variety for over 25 years. Although there are many "Gold" options available on the market, they're not equally sweet and delicious. The quality of the land and the quality of the grower are directly linked to the quality of the pineapple. We strive for perfection in all three.

### Where is Maui Gold® grown?

Maui Gold® pineapple is grown across 1,350 acres on the slopes of Haleakala. Maui Gold Pineapple Company's main farming operation, together with its packing facility and administrative offices, is located in Hali'imaile at an elevation of 1,100 feet. This small plantation town - which is also home to Bev Gannon's Hali'imaile General Store - has been an integral part of the pineapple community since the 1930s. Our idyllic location in upcountry Maui provides the perfect growing conditions for Maui Gold®: warm sunny days, cool nights, fresh water and rich volcanic soil.

### How long does it take to grow a Maui Gold® pineapple?

Although it takes a full 18 months to grow a Maui Gold® pineapple, the fruit is



F-84

EXHIBIT

### Water Charges

#### Water Use Charges for Fiscal Year 2015

All figures are in dollars per 1,000 gallons. The Fiscal Year runs from July 1 to June 30. For example, Fiscal Year 2015 is from July 1, 2014 to June 30, 2015.

#### Rates for Single-Family Dwellings with 5/8" Meters

Gallons	Total
0 - 5,000	\$1.90
5,001 - 15,000	\$3.60
15,001 - 35,000	\$5.40
Over 35,000	\$6.05

#### General Rates for All Other Water Consumers

Gallons	Total
0 - 5,000	\$1.90
5,001 - 15,000	\$3.60
Over 15,000	\$5.40

#### Agricultural Rates

Gallons	Total
Over 15,000	\$1.00

#### Non-Potable Agricultural Rates

Gallons	Total
All usage	\$0.75

Water Service Charges  
Below are regular and agricultural water service charges.

Size of Meter Cost Per Meter Per Month

# EXHIBIT E-85



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Water Charges

How To Read Your Water Bill

Agricultural Water Rates

Automatic Bill Payment

How To Read Your Water Meter

Online Services

Employment Opportunities

Email Notifications

Emergency Preparedness

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Honolulu, HI 96813-4212  
Telephone: (808) 521-9200

Attorneys for  
HAWAIIAN COMMERCIAL AND SUGAR  
COMPANY

2014 FEB 18 PM 4:18

COMMISSION ON WATER RESOURCE MANAGEMENT  
OF THE STATE OF HAWAII

In the Matter of:

IAO GROUND WATER MANAGEMENT  
AREA HIGH-LEVEL SOURCE WATER  
USE WUPAS AND PETITION TO AMEND  
INTERIM INSTREAM FLOW STANDARDS  
OF WAIHEE, WAIIEHU, IAO, & WAIKAPU  
STREAMS CONTESTED CASE HEARING

Case No. CCH-MA-06-01

HAWAIIAN COMMERCIAL AND SUGAR  
COMPANY'S REBUTTAL BRIEF;  
DECLARATION OF RICK W. VOLNER,  
JR.; DECLARATION OF GARRET S.  
HEW; DECLARATION OF  
CHRISTOPHER J. BENJAMIN; EXHIBITS  
E-R32, E-R33, E-R34 AND E-R35;  
CERTIFICATE OF SERVICE

Hearing:

Date: March 10-28, 2014

Hearing Officer: Dr. Lawrence Miike

**HAWAIIAN COMMERCIAL AND SUGAR COMPANY'S  
REBUTTAL BRIEF**

**I. INTRODUCTION**

HC&S respectfully submits this rebuttal brief to respond to the arguments in the responsive briefs filed by Hui/MT and OHA. In summary, Petitioners' arguments should be rejected for the following reasons:

- **System Losses:** The IIFS should not be increased by the amount of seepage loss from Waiale Reservoir because CWRM has already taken such seepage into account in

amending the IIFS, and HC&S has responded to CWRM's mandate that it explore solutions for mitigating such losses. Petitioners' position that HC&S should be held to the percentage level of system losses that WWC has allegedly been able to achieve is overly simplistic because it overlooks important differences between the infrastructure that makes up the HC&S system versus the WWC system. Moreover, HC&S's analysis of the seepage rate factors for various materials in irrigation conveyance systems contained in the National Engineering Handbook cited by WWC supports the system loss estimates of HC&S.

- **Fields 921 & 922:** OHA effectively concedes that Fields 921 and 922 are being reasonably cultivated. OHA then misleadingly selects just portions of HC&S's water application data to wrongly suggest that all of HC&S's seed cane fields require a lower water duty than the 5,958 gad contained in the 2010 D&O.
- **Well No. 7:** The tripping of the sump shutoff feature for the Well No. 7 pumps is not an equipment malfunction. It is plausibly explained by the lowering of the water level in Well No. 7, which is corroborated by the lowering of the water levels in other wells in Central Maui and is unsurprising given HC&S's increased usage of Well No. 7 and the diminished recharge of its water source due to the 2010 D&O IIFS amendments.
- **HC&S's Incremental Impacts Analysis Model:** The model that HC&S created to help CWRM understand the incremental impacts of various IIFS amounts on HC&S is valid for the purpose offered, notwithstanding Petitioners' criticisms.
- **Importance of Maintaining the Viability of HC&S:** A&B is committed to keeping its Maui agricultural lands in cultivation, but under HC&S's current business model, the availability of water is critical for HC&S to remain viable.

- **Petitioners' Failure to Quantify Their Water Needs:** Petitioners have not complied with the Hearings Officer's request that they quantify their water needs on a stream-by-stream basis and have failed to acknowledge the positive effects of the stream flows that have already been restored.

## **II. DISCUSSION**

### **A. No Further Reductions in HC&S's Allowance For System Losses Are Appropriate.**

OHA overreaches in arguing that 8 mgd, representing the upper end of the estimate of seepage loss from Waiale Reservoir, should be "summarily added to the IIFS." OHA Responsive Brief at 13. OHA demands that this amount be excluded from the calculation of HC&S's reasonable uses because HC&S has not taken steps to mitigate such loss. What OHA fails to mention is that CWRM has already taken into account the seepage loss due to Waiale Reservoir in setting the amended IIFS. Adding another 8 mgd to the IIFS as OHA suggests would count the same seepage loss against HC&S twice.

The 2010 D&O estimated that it is practical to prevent 6-8 mgd of losses through seepage of Waiale Reservoir. *See* 2010 D&O, COL 229. Hence, CWRM did not include any portion of the estimated seepage loss from Waiale Reservoir in estimating HC&S's reasonable uses. CWRM estimated HC&S's total reasonable uses to be 29.81 mgd, which includes 2 mgd representing half of 3-4 mgd estimated system losses *other than those attributable* to Waiale Reservoir. In calculating the 2 mgd allocation for system losses, CWRM expressly excluded the 6-8 mgd of seepage loss from Waiale Reservoir. *See id.*, COL 231. Thus, OHA's demand that another 8 mgd be added to the IIFS is unreasonable.

OHA also too hastily assumes that HC&S is content to allow the seepage from Waiale Reservoir to go unabated indefinitely. In fact, HC&S has responded to the mandate in the 2010

D&O regarding seepage loss from Waiale Reservoir. As HC&S previously reported to CWRM, HC&S has essentially three options: (i) line the existing reservoir with concrete or HDPE; (ii) line a smaller configuration and limit its use accordingly; or (iii) bypass the reservoir. See Declaration of Rick W. Volner, Jr. dated February 18, 2014 (“*Volner 2/18/14 Decl.*”) at ¶ 37.

If there will be a further reduction in deliveries to Waiale Reservoir due to a further amendment of the IIFS, HC&S will most likely choose the bypass option. This will reduce HC&S’ flexibility to store water when stream flows are high, but even if lined in its current configuration, the reservoir capacity is limited to two to three days of average daily irrigation demand. See *id.* at ¶ 38. Until the final IIFS is determined and average surface water deliveries identified, it is difficult for HC&S to perform an appropriate cost benefit analysis of the seepage mitigation options for Waiale Reservoir. Any further reduction in surface water flows will negatively impact any cost benefit analysis HC&S performs and will probably lead to HC&S severely limiting impounded water at Waiale Reservoir, or bypassing the reservoir completely. See *id.* ¶ 39. Once HC&S makes a final decision to elect one of the three options, and the chosen solution is implemented, the 6-8 mgd in seepage that was deducted from the estimate of HC&S’s reasonable use should be substantially reduced. Regardless of which option HC&S ultimately settles upon for Waiale Reservoir, however, there is no justification for Petitioners’ request to double the reduction already made to the amount of HC&S’s reasonable use allotment for purpose of determining the IIFS.

Petitioners have also argued that HC&S should be held to a system loss of 5% based on testimony submitted by Wailuku Water Company LLC (“*WWC*”) to the effect that WWC has reduced its estimated system losses to approximately 5%. This oversimplistic position overlooks important differences between the infrastructure that makes up the HC&S system versus the

WWC system. The WWC reservoirs, for example, are more in the nature of settling ponds, which overflow back into the ditch system, than true reservoirs, such as HC&S reservoirs 91 and 92, which are regulated with inlet control gates and outlet valves and are managed for the regular storage and release of irrigation water. Unlike HC&S, who is using its system for irrigation, WWC does not need all of its reservoirs and has closed several, contributing to a reduction in system losses. Further, WWC has closed off several ditches that it no longer uses and has completely stopped diverting water from North Waiehu Stream. HC&S, on the other hand, has not removed any portions of its system from its operations. *See* Declaration of Garret Hew dated February 18, 2014 (“*Hew 2/18/14 Decl.*”) at ¶ 4.

HC&S does not know exactly how WWC arrived at its estimate of its current system losses. HC&S has consulted the National Engineering Handbook referred to in WWC’s testimony, however, to obtain seepage rate factors that could be used to estimate rates of seepage from the various sections of the HC&S system. *See id.* at ¶ 5. Exhibit E-R33 is Figure 2-50 from the National Engineering Handbook, which graphs the relationship of different conveyance system materials to expected seepage loss rates. Exhibit E-R34 is a map depicting the sections of the HC&S West Maui irrigation system for which HC&S has estimated seepage loss rates utilizing Exhibit E-R33. *See id.*

In order to estimate expected seepage loss for the HC&S system, excluding Waiale Reservoir, HC&S prepared a table which summarizes, for each section of the system, its length, average surface area under water and the type of material that holds or conveys the water. To calculate an expected range of seepage, HC&S selected what it believes would be a relatively low seepage factor along with what it believes would be relatively a high seepage factor from Exhibit E-R33. Exhibit E-R35 is a copy of the resulting table. This exercise produced an

expected range of seepage from a low of 2.05 mgd to a high of 4.10 mgd. This corresponds to a percentage rate of loss of from 8.7% to 17.3%. *See id.* at ¶ 6.

Exhibit E-R35 also contains a table that HC&S prepared to estimate the average daily amount of evaporation that can be expected from the surface of the water contained in the HC&S system, excluding Waiale Reservoir. This was calculated by multiplying the average daily evaporation rate of 0.40 acre-inches by the average daily surface area of the water in the system, which yielded an average daily evaporation loss of 95,889.51 gallons, or 0.096 mgd. The total expected seepage losses from seepage and evaporation combined range from 2.15 mgd to 4.20 mgd. This corresponds to a percentage rate of loss of from 9% to 17.7%. *See id.* at ¶ 7.

This range of expected seepage and evaporation losses compares well with the 3-4 mgd estimate that HC&S provided at the initial hearing, and demonstrates that the 2 mgd allowable system loss established in the 2010 D&O is actually a little too low. There are additional system losses, besides seepage and evaporation, than are reasonably to be expected but are difficult to measure and to estimate. These include water lost during the backflushing of sand filters, during the startup and shutdown of irrigation rounds (when water pressure is established and the drip tubes are purged), and during the repair and water testing of the irrigation system prior to planting of the crop. *See id.* at ¶ 8.

Accordingly, as set forth in the testimony of Garret Hew and supported by the exercise set forth in Exhibit E-R35, HC&S respectfully submits that a reasonable allowance for system losses for HC&S' West Maui system, excluding Waiale Reservoir, would be 4 mgd. *See id.* at ¶ 9.

**B. A Reduction in the Water Duty For Fields 921 and 922, and the Balance of HC&S's Seed Cane Farm, is Not Justified Based on OHA's Analysis, Which Arbitrarily Cherry-Picks Irrigation Data For HC&S's Seed Cane Fields.**

OHA initially argued that it would be wasteful for HC&S to irrigate Fields 921 and 922,



# Central Maui Recycled Water

## Verification Study



Prepared for:  
County of Maui, County Council

Prepared by:  
Department of Environmental Management,  
Wastewater Reclamation Division

Department of Water Supply  
Water Resource Planning Division

December, 2010

**EXHIBIT 'E-88'**

## CHAPTER 1 – INTRODUCTION

This study was prepared as required by a fiscal year 2011 budget provision that stated:

*“Provided, that prior to expending funds the Department of Environmental Management shall work with the Department of Water Supply and private entities on a new verification study that provides the Council with future alternatives for the transmission and optimization of R-1 recycled water from the Kahului Wastewater Reclamation Facility (WWRF) in order to provide a source of irrigation water for existing and planned future projects, and to provide alternatives to the use of injection wells. The Department of Environmental Management shall transmit a status report regarding this matter to the Council by January 1, 2011.”*

This study includes data on the current status of R-2 recycled water usage in the Central Maui area, as well as, information regarding developing planned and future projects.

### **Background**

The Kahului WWRF serves the Central Maui area from Waiehu to Kuuu (Figure 1-1). The current dry weather flow capacity is 7.9 million gallons per day (mgd). Currently, all of the wastewater processed by the facility is treated to R-2 recycled water standards meaning that there are restrictions on its uses and applications. Key restrictions on the use of R-2 water via spray irrigation are that R-2 water can only be used at night and there must be 500 foot buffer zones between the area being spray irrigated and adjacent properties or roadways. In order for the recycled water from the Kahului WWRF to be utilized in the urban environment such as for spray irrigation at commercial properties, the facility would need to undergo an upgrade to enable it to produce R-1 water. An R-1 upgrade at Kahului WWRF would improve the facility's capability of consistently producing recycled water that meets or exceeds regulatory standards. It also allows greater flexibility of use for R-1 water customers.

While the Hawaii Department of Health (DOH) has approved the use of R-2 water for sugar cane irrigation, HC&S has indicated their preference for R-1 water due to its user flexibility and concerns about workers coming in direct contact with the recycled water.

The current average dry weather wastewater flow to the Kahului WWRF is 4.40 mgd. The volume of R-2 water reused from the facility ranges from 3 to 7% of the incoming wastewater flow. The daily average of R-2 water used is 0.2 mgd with most of the recycled water utilized within the Kahului WWRF for landscape irrigation and industrial uses. Some of the R-2 water is sold to construction companies that use it for dust control.

## CHAPTER 2 – KAHULUI WWRF R-1 WATER UPGRADE

The purpose of this chapter is to provide a cost estimate to upgrade the Kahului WWRF to R-1 water capability. As explained in Chapter 1 of this report, the Kahului WWRF currently produces R-2 recycled water. While R-2 water may be used for spray or drip irrigation of some agricultural crops, it has limited potential for landscape irrigation at commercial properties as most properties utilize spray irrigation and the Hawaii DOH requires 500 foot buffer zones for R-2 water applied via spray irrigation. Thus, an R-1 upgrade would be required at the Kahului WWRF if the recycled water from the facility was to be distributed to Central Maui commercial properties for landscape irrigation. While an R-1 upgrade would not be required if the recycled water was distributed to HC&S for irrigation of sugar cane or other crops, it would still be desirable since it would significantly increase the reliability of recycled water service as well as provide HC&S with more flexibility when utilizing the recycled water. With R-1 water, no buffer zones would be required and workers would be more at ease when coming in direct contact with this highly treated recycled water. In addition, HC&S has stated that the most desirable location to use the recycled water would be in the vicinity of Maui Lani towards Maalaea where seed cane is cultivated. The recycled water distribution system could be designed and constructed so that it provides R-1 water to commercial properties for landscape irrigation and then provides whatever excess R-1 water is left over to HC&S where it could be used for seed cane irrigation.

R-1 water is recycled water that is at all times oxidized, filtered, and then exposed to a high level of disinfection. Coagulation capability is required to remove excess solids, if present, from the recycled water prior to filtration and continuous turbidity monitoring is also required to insure that the turbidity of the recycled water is low enough to insure satisfactory disinfection. The Kahului WWRF utilizes activated sludge to achieve oxidation and the facility has existing traveling bridge sand filters that while approved for the production of R-1 water, are limited because the loading rate to these filters can not exceed 2 gallons per minute per square foot. The existing filter basins could be retrofitted with a coagulation system and another type of filter with a higher loading rate. Therefore, the equipment that would need to be installed to upgrade the Kahului WWRF to R-1 water capability includes a coagulation system, a filtration system, a turbidity monitoring system, an automatic diversion system for use when R-1 turbidity standards are not met and an ultra violet disinfection system.

Based on the above R-1 water equipment requirements, the budgetary construction cost estimates to upgrade the Kahului WWRF to R-1 water capability are shown below in Table 4-1. The R-1 water capacity after the upgrade would be 6.0 mgd. The addition of a third UV channel could increase the R-1 capacity to the facility's hydraulic and treatment capacity of 7.9 mgd.

**Table 2-1: Budgetary Cost Estimate – Kahului WWRF R-1 Water Upgrade**

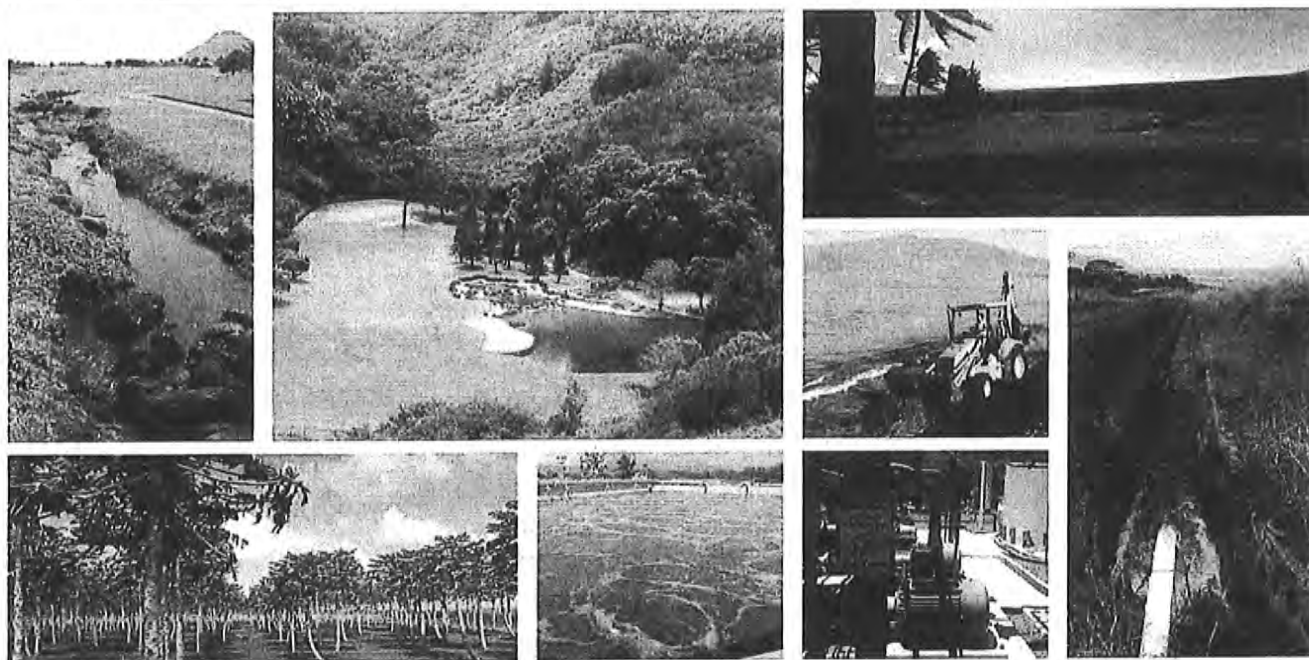
Equipment	Number of Required Units	Cost Estimate
Coagulation System	1	\$300,000
Filtration System	1	\$1,600,000
Turbidity Monitoring System	2	\$25,000
Diversion System	1	\$240,000
UV Disinfection System	2	\$2,800,000
<b>Budget Construction Cost Estimate</b>		<b>\$4,965,000</b>

# 2013 Update of the Hawaii Water Reuse Survey and Report



Prepared For  
Department of Land and Natural Resources  
Commission on Water Resource Management

JULY 2013



THE LIMTIACO CONSULTING GROUP  
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

**EXHIBIT 'E-89'**

## EXECUTIVE SUMMARY

Water reuse is well established in Hawaii and it continues to play an important role in sustaining our State's water resources. There are numerous benefits associated with water reuse including preservation of water supplies and the reduction of wastewater effluent disposal practices that may be detrimental to the environment. Despite these benefits, the annual volume of recycled water beneficially reused in Hawaii has not substantially increased since 2004, when the original Water Reuse Survey and Report was developed. Nearly nine years later, this report provides an update by describing current recycled water usage, opportunities, and challenges in Hawaii.

Various qualities of recycled water identified by the Department of Health are produced at municipal and private wastewater reclamation facilities for reuse throughout Hawaii's counties. The County of Maui's Wastewater Reclamation Division and the City and County of Honolulu, Board of Water Supply are the most progressive municipal agencies with regards to water reuse and have invested heavily in their programs. Both agencies have near and long-term plans to expand their programs. The County of Kauai also has made significant strides in recent years by upgrading two of its wastewater reclamation facilities to tertiary treatment capability and by implementing a plan to develop a recycled water distribution system. Water reuse on the island of Hawaii occurs primarily at private resort areas.

**Table 1: Recycled Water Use by County**

	County of Maui	City and County of Honolulu	County of Kauai	County of Hawaii
R-1 (mgd)	3.03	6.54	1.72	0.71
R-2 (mgd)	0.05	1.48	1.29	0.60
R-3 (mgd)	< 0.01	0	0	0
R-O (mgd)	0	1.74	0	0
<b>TOTAL</b>	<b>3.08</b>	<b>9.76</b>	<b>3.01</b>	<b>1.31</b>

Traditionally, golf course irrigation has been the most common application for recycled water; however, the realm of applications has diversified over the years and continues to have more potential for growth. The number of landscape irrigation projects in urban areas has greatly increased since 2004 with the availability of higher quality recycled water. Use of recycled water in industry has also grown. Agricultural irrigation with recycled water is ongoing but limited; however, this application has great potential for expansion, since large volumes of water are needed to irrigate crops. In order to boost Hawaii's self-sufficiency by locally growing more produce, the State legislature has committed funding for U.S. Department of Agriculture projects. Recycled water has received attention in the State of Hawaii's 2013 Legislative session where House Resolution No. 187 and House Concurrent Resolution No. 232 (Appendix B) were introduced, which would establish a task

increase recycled water use and reduce reliance on injection wells for effluent disposal. In exchange for 185,000 gpd of R-1 water capacity, the Honua Kai Resort agreed to contribute funding to the design and construction of more UV disinfection capacity at the Lahaina WWRF as well as the design of a planned elevated 1.0 MG storage tank. The elevated tank will result in a fully-pressurized R-1 water distribution system and make recycled water available to commercial properties in west Maui that are near the WWRD's existing distribution piping.

The resort commenced using R-1 water in 2009; however, it only has adequate pressure from the main pipe line when the Lahaina WWRF is pumping R-1 water to the Kaanapali Resort and Golf Courses. Once the system is fully-pressurized, the Honua Kai Resort will be able to access the R-1 water at any time for irrigation of its landscaping.

The salinity of the R-1 water has presented some challenges for the resort. Salinity reduces osmotic uptake of water and may cause stunted plant growth, wilting and other damage (Tanji, 2006). To address this issue, a "fertigation" system that injects gypsum as well as organic-based fertilizers into the R-1 water was installed. Gypsum supplies calcium ions to replace excess sodium in the soil and results in increased water intake rates and improved soil aeration. Occasional flushing of sensitive landscape areas with potable water has also helped.

### **3.3.1.3. Water Reuse in Central Maui**

The County of Maui has not developed a recycled water distribution system in central Maui. Many of the potential projects that could use recycled water (such as parks, a golf course, and sugar cane fields) in the area are using high-quality, inexpensive non-potable water for irrigation. Kanaha Cultural Park previously utilized R-2 recycled water from the County's Wailuku-Kahului WWRF to help establish native plants and coconut trees; however, R-2 water use was discontinued in 2008 after it was discovered that the drip irrigation lines were being vandalized. A consultant for the County is currently preparing a feasibility study that will examine future water reuse opportunities in central Maui. Since the Wailuku-Kahului WWRF is located along the northern coast of Maui, the County is also once again exploring construction of a new wastewater treatment facility further inland to address the constant threats of tsunamis and salt air corrosion that are present at the current location.

The current water reuse projects in operation in central Maui are the Pukalani Country Club and the Haleakala National Park Visitor Center.

courses, as well as commercial buildings and industrial sites. Solids generated at the sewer mining treatment plants are typically returned to the collection systems for treatment at downstream wastewater treatment facilities.

Sewer mining is being used in Sydney, Australia for both urban and park irrigation. The Sydney Olympic Park Authority's Water Reclamation and Management Scheme at Homebush Bay is Australia's first large-scale urban recycling scheme using sewer mining. The recycled water is reused for irrigation and residential non-potable uses. Recycled water replaces 50% of the potable water that would otherwise be used at Sydney Olympic Park and Newington Estate (Sydney Water, 2013).

A potential area in Hawaii where sewer mining may be feasible is the resort community of Wailea, Maui. Wastewater from this area is pumped approximately seven miles to the County of Maui's Kihei WWRf for treatment. Research conducted for the MWWRD's South Maui Verification Study revealed that up to 1.0 mgd of potable water is currently used for landscape irrigation at Wailea's resorts and multi-family townhouses. A sustainable approach to managing Wailea's wastewater and reducing the substantial use of potable water for irrigation would be to construct a scalping MBR plant that treats wastewater from the region and produces R-1 water. The R-1 water could then be used locally, closer to where the wastewater was generated and treated, to supplant the use of potable water for landscaping irrigation at the resorts and townhouses. Waste solids from the MBR plants would be discharged back into the County's sewer system.

Urban Oahu also has potential sewer mining applications at commercial properties that use large volumes of water for irrigation and are close to main sewer lines. These properties include Kapiolani Park (300 acres with an estimated irrigation demand of 1.8 mgd), the Ala Wai Golf Course (121 acres with an estimated irrigation demand of 0.73 mgd), and the Honolulu Zoo (42 acres with an estimated irrigation demand of 0.25 mgd).

#### **5.1.13. Agriculture**

There is great potential for the use of recycled water at agricultural projects throughout Hawaii, as large volumes of water are necessary for irrigating crops. Should the agriculture industry accept the use of R-1 water as a viable and safe irrigation source, demand could easily outpace supply. In addition to reducing uses of other water sources, recycled water also carries useful nutrients beneficial to crops that can help lower the need for fertilizer. R-1 has been approved for direct contact with edible food crops by the DOH, and is used to grow many vegetables in the U.S. and throughout the world. Many

# **MAUI ELECTRIC COMPANY 2030 VISION**

September 9, 2014

**EXHIBIT 'E-90'**







using better management practices which are recorded on a web-based system.

The best thing about BMP is that growers who have already completed COMPASS training, taken part in Water Use Efficiency projects or developed Land and Water Management Plans, are one step ahead and well on the way to developing their own cost saving management tool. An added bonus for cane farmers is that government regulation is much less likely when farmers can prove that they are farming responsibly.

BMP is a powerful weapon to allow farmers to work in harmony with the wider community. Some areas where environmental concerns are already being addressed include:

#### **Chemical use**

Rural industries have developed chemical collection services and a self-regulatory training and education program for users of agri-chemicals. Over 60% of Queensland cane growers have completed a voluntary one-day course and have been accredited in the use of farm chemicals. The result has been a marked increase in proficient use and a reduction in application rates and frequency. New tech has become available which allows growers to target application to where it is needed.

#### **Green cane harvesting & trash blanketing**

One of the biggest cultural changes in cane growing has been the replacement of pre-harvest firing by the adoption of green cane harvesting and trash blanketing (GCTB). In 2014, some 80% of the Queensland crop was cut green compared with only 16% in 1987.

Adoption of GCTB has been driven by both ecological and efficiency reasons, and has yielded dividends in both environmental and productivity spheres.

Green cane harvesting has dramatically reduced the need for cane firing and its accompanying smoke issues, while the ensuing trash blanket protects soil from erosion during heavy rains and flooding. Blanketing increases the amount of organic matter in the soil, improving composition and structure. It also assists in weed control and conserving soil moisture. GCTB has also contributed to a reduction in nitrogen requirements, while at the same time elimination of burning has made harvesting schedules much more flexible.

#### **Irrigation**

More than 60% of all cane production is irrigated. Irrigation is costly, with water and associated pumping costs accounting for one third of all costs. Saving water is good business and environmentally responsible.

Irrigation water is monitored closely on all farms, with soil moisture readings an essential component of irrigation timing. Drip (or trickle) irrigation and low-pressure, overhead irrigation systems are being increasingly utilised, not just to save total volume but also to improve water use efficiency and productivity. Measurement of nutrient movement in irrigation run-off and ground water is widely practiced to ensure hard-won dollars are not wasted.

Tailwater dams are commonly used to ensure that water run-off after irrigation is captured and reused. The effect has been to dramatically reduce off-farm movement of nutrients, thus protecting fragile environmental systems while increasing production and reducing costs.

#### **Riparian management**

Clearance of existing vegetation is necessary to bring new land into production; however, recent recognition of both the environmental and economic importance of riparian zones (vegetation adjacent to watercourses) has changed practices of a lifetime. Trees are now being left adjacent to water ways on all new developments and trees are being replanted in already established areas, even though that replanting may reduce available area for cultivation.

Riparian zones have a major role in the filtration of nutrient run-off, stabilisation and prevention of bank erosion, and the siltation of waterways. They also play a vital part in the provision of wildlife corridors and in vermin control. Planting trees on river banks eliminates undergrowth, weeds and grasses, greatly reducing rat populations around cane fields. In turn, this dramatically reduces the need for costly chemical controls.

#### **Acid sulfate soils**

Some growers, particularly those near coastal regions in New South Wales, have encountered 'sour soils' - those with high acid content. These have provided generally poor levels of productivity. Exposure and drainage of acid sulphate soil has also had significant environmental ramifications, with acid run-off having the potential to affect fish breeding areas.

Recent awareness of both the economic and environmental consequences of cultivating acid soils has resulted in a more scientific approach being taken to mapping and identification of potential trouble spots, soil testing, drainage methods and neutralisation. This has produced positive environmental outcomes, while improving farm productivity.

#### **Research & extension**

The Australian sugar industry commits around \$38 million a year to research, development and extension with much of this targeted at improving sustainability as well as productivity.

As a direct result of the industry's aggressive research and development program, advances have been made in areas such as pest control, where many of our programs are world class and an example to other Australian industries. Many of the pest control programs now being developed are based on integrated pest management strategies involving biological control agents, transgenic canes, the use of chemicals and changed cultural practices.

#### **Impressive uptake of good farming practices**

These days good environmental guardianship is a normal part of running a cane growing business. Some of the good farming practices being adopted widely by growers are explained below.

GOOD FARM PRACTICE	BENEFITS
--------------------	----------

<p>Green cane harvesting and trash blanketing</p> <p><i>Retaining stubble from one year to the next and working the crop, including harvest, without burning the trash</i></p>	<ul style="list-style-type: none"> <li>• Increased soil moisture, plant available water and organic carbon percentages</li> <li>• Reduced potential for soil erosion</li> <li>• Reduced off-site leakage/loss of nutrients and pesticides</li> <li>• Increased beneficial soil micro-organisms, earthworms and other beneficial</li> </ul>
<p>Reduced tillage and minimum tillage systems</p> <p><i>Soil remains relatively untouched during the preparation and growing season by less working of the field. This includes separating where cane is grown from vehicle traffic in the paddock. This is achieved by matching wheel and rowspacing, reducing the impact of compaction to the same small area</i></p>	<ul style="list-style-type: none"> <li>• Improved soil health by conserving organic matter, preserving beneficial soil biota and soil fauna habitat</li> <li>• Reduced soil compaction</li> <li>• Increased rainfall infiltration and moisture holding capacity</li> <li>• Reduced crop damage and pest incursions</li> <li>• Improved fertiliser management</li> <li>• Reduced erosion risk</li> <li>• Improves nitrogen fixation by legume break crop</li> <li>• Improved weed control though reduced weed germination which lowers costs and facilitates uptake of banded/hooded herbicide application</li> <li>• Lowers costs of production</li> </ul>
<p>Rotation cropping and Legume break cropping</p> <p><i>The planting of fallowland, about 15% of a farm area, on an annual rotational basis with nitrogen fixing legumes (for example soybeans, peanuts and chickpea)</i></p>	<ul style="list-style-type: none"> <li>• Improved soil structure and moisture holding capacity</li> <li>• Returns nitrogen to soil and reduces need for fertilisers</li> <li>• Offers good weed control options</li> <li>• Assists to control cane pest and disease issues</li> <li>• Facilitates the uptake of minimum tillage by planting to suit controlled traffic configuration for cane</li> <li>• Delivers a better balanced soil biota</li> <li>• Fewer root pathogens</li> <li>• Increased ability to biologically fix nitrogen, improving soil condition and productivity</li> <li>• Reduce the need for irrigation through improved moisture holding capacity</li> <li>• Leads to improved profitability</li> </ul>
<p>Precision agriculture</p> <p><i>Matching crop agronomy to the production potential of different parts of paddock/farm</i></p>	<ul style="list-style-type: none"> <li>• Allows tailored application of inputs such as fertiliser/herbicides through use of mapping, soil tests, variable rate technology and hooded sprayers (which minimises over/under application)</li> <li>• Increases yield potential of farm by targeting input needs</li> <li>• Provides valuable yield and paddock variability data for decision making</li> <li>• Promotes improved farm record keeping</li> <li>• Facilitates uptake of better paddock design by identifying soil type variability, should result in better matching of irrigation system to soil type</li> <li>• Facilitates the uptake of better farming technology</li> <li>• Improved profitability after initial outlay</li> </ul>
<p>Controlled traffic</p> <p><i>Rowspacings match equipment</i></p>	<ul style="list-style-type: none"> <li>• Reduced soil compaction</li> <li>• Reduced damage to the cane plant and roots and ease of harvesting lodged crops with minimal impact on cane plant stalks and stool</li> <li>• Reduction in fuel and time due to reduced overlap</li> </ul>



 [Environment Report 2008 \(1.9 MB\)](#)



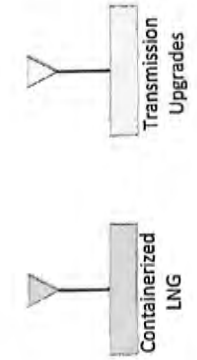
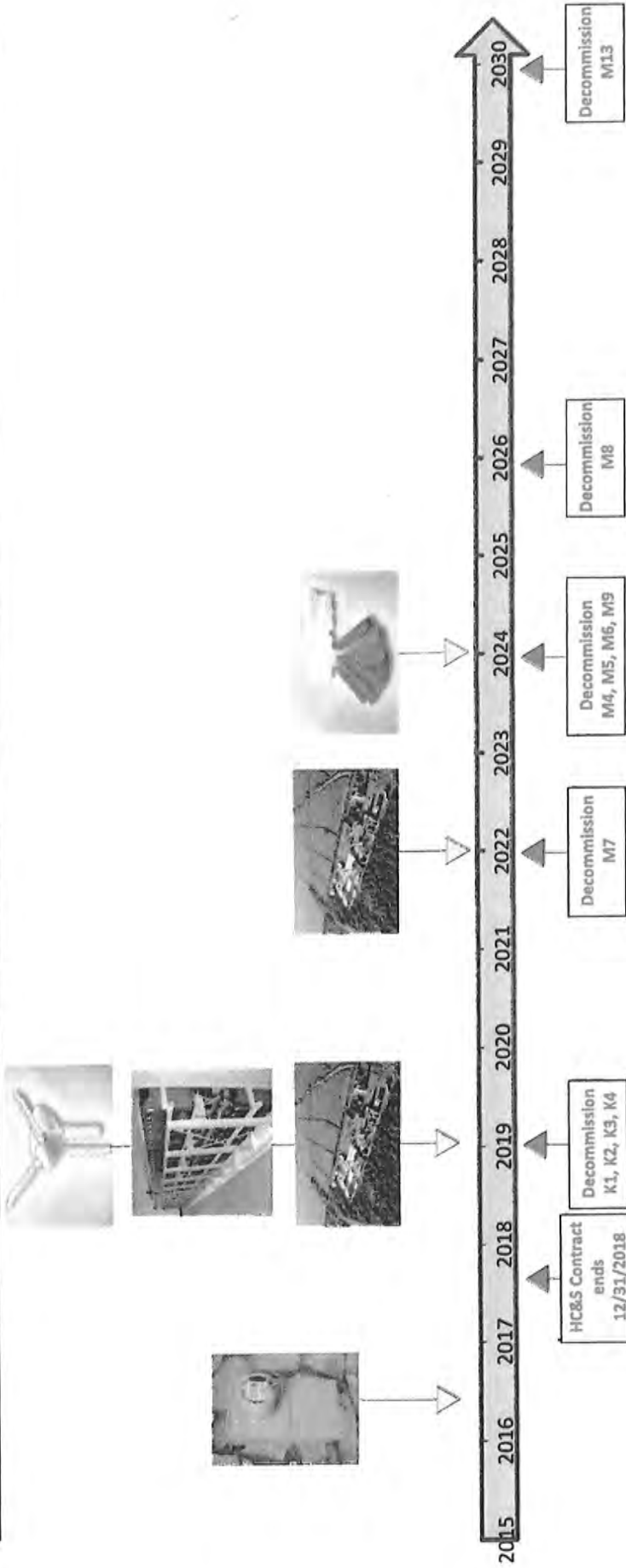
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 [Environment Report 2005 \(1.3 MB\)](#)

# RESOURCE PLAN - MAUI 2015-2030

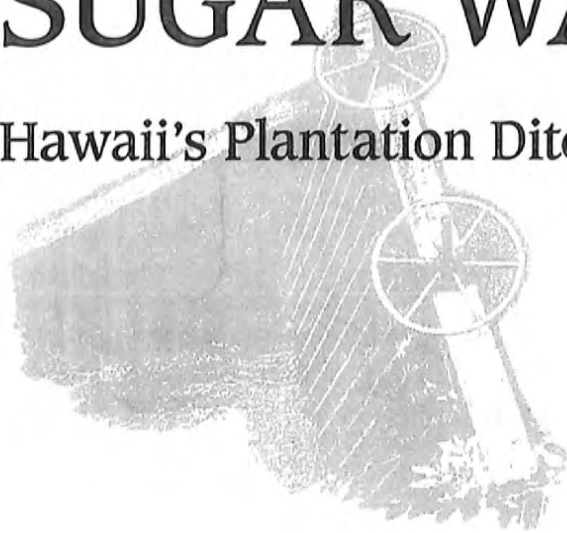
Demand Response Programs
Capacity Value of Wind
Distributed Generation PV (Forecasted to be ~129 MW in 2030)



CAROL WILCOX

# SUGAR WATER

Hawaii's Plantation Ditches



A Kolowalu Book  
University of Hawai'i Press, Honolulu

**EXHIBIT** E-92

## Sugar Water in Hawaii

U.S. Senate failed to ratify. King Kamehameha V continued this effort, sending an emissary to Washington in 1867. A treaty was approved by the U.S. president, his cabinet, and the Hawaiian legislature, but again it was defeated in the U.S. Senate, and again in 1869 and 1871. The cession of Pearl Harbor as part of reciprocity was discussed in 1873 during the reign of King Lunalilo, who died after reigning for only a year. He was succeeded in 1874 by King David Kalakaua, who in that same year became the first monarch of any country to visit Washington, where he petitioned President Grant and the Congress on behalf of reciprocity for Hawaii.

The Reciprocity Treaty was at last ratified by the U.S. Congress, and was signed by King Kalakaua in 1876. In addition to allowing tax-free trade for most products between Hawaii and the United States, it ceded to the United States certain rights to Pearl Harbor, rights that were later expanded. The overthrow of the Hawaiian Kingdom and establishment of the Provisional Government in 1893, and the country's subsequent annexation by the United States in 1898, ensured that these mutual benefits would continue. The Reciprocity Treaty was predicated on full government support of the fledgling sugar industry, including its efforts to develop water. Without that support, which included allowing the sugar planters to transport water out of the watershed, investors would not have been attracted to Hawaii.

Upon the adoption of the Reciprocity Treaty, prospective sugar planters began at once to invest in the development of both surface and groundwater. In 1878, with Baldwin and Alexander's successful Hamakua Ditch, and again in 1879, with James Campbell's successful artesian well, it was clear that water would be available in whatever quantities were needed, to be transported wherever needed. The water development systems went by the title of "ditches." It is a term both humble and misleading: misleading because they were not all ditches—many were mostly flumes, siphons, and tunnels—and humble because their size and scale were often quite large. And they were everywhere. Very few watersheds escaped the winding, burrowing network of ditches.

The development of Hawaii's surface water was unique in that it was done almost exclusively by the private sector. Water projects in the western United States, which was undergoing a parallel history of water development, were government-funded and controlled. The Hawaiian Kingdom, ever in debt, was unable to duplicate this effort. When Maui citizens petitioned King David Kalakaua to irrigate the dry plains of the Maui "commons," Kalakaua demurred. As the government explained in its 1878 agreement with Claus Spreckels: "The Hawaiian Government is not now ready or willing to undertake such works, and incur such expenses."<sup>1</sup> Although a dozen years later Kalakaua investigated the feasibility of bringing water out of Hawaii's Hama-

The changing times called for new ways to resolve disputes. In order to address conflicts associated with water rights and the newly established right to own land introduced by the *mahele*, King Kamehameha IV established Commissions of Private Ways and Water Rights in each region in 1860. These Water Commissions were the official courts of appeal. A glimpse into these troubled times is provided by Water Commissioner Daniels, who said in 1866: "There is going to be much trouble in Wailuku respecting Water as the plantations are taking all the water from the natives and I am sorry to say the natives will, if it continues, become very short of Kalo for food."<sup>9</sup> These commissions paralleled the *konobiki* system in several important respects, above all their local familiarity and accountability.

In 1888, Kalakaua consolidated the regional Commissions of Rights of Way and Water Rights into one commission for each area. In 1907, by which time Hawaii was a territory of the United States, the statute was changed so that the water commissioners were in fact the circuit court judges and the commissions ceased to exist. This centralization of authority differed fundamentally from the traditional water management and allocation system administered by a *konobiki*. It was difficult for a protesting farmer to expect redress from a formal, distant, and impersonal court.

The public record, however, seems to include little protest over the shift of water away from the land. The records of the commissioners would no doubt provide answers to the nature and depth of protest. But with two modest exceptions, these records have not been located. Therefore, we can only speculate why the remaining record—newspapers, court documents, oral tradition—is silent on this issue. For one thing, the decline of the Hawaiian population must have been the single overriding concern of the native people. In the 100 years after Captain Cook's arrival, the Hawaiian population decreased perhaps as much as 80 percent, leaving a native people of only 60,000 in 1876.<sup>10</sup> Some of the causes of this are known: introduced diseases became epidemic and lethal, the birth rate dropped dramatically, many young men joined ship crews and did not return. No group was spared, and just as the young King Kamehameha II and his Queen died in London in 1824, so at home did the *kabuna*, those teachers of dance and fishing, religion, and healing, and the *konobiki*, those in charge of overseeing the management of the land and its resources, the *ali'i*, the kings, queens, and chiefs, and the *maka'ainana*, the bulk and muscle of Hawaiian society. A degree of despair, fatalism, and chaos must have characterized those times. Large numbers of Hawaiians left their traditional homes in the rural areas. By the time of sugar's ascendancy, when the large water projects were diverting water away from the valleys and their villages, these villages did not have the population, organization, or will to protest.



## Sugar Water in Hawaii

*needs. The Court declared that surplus water went with the ahupuaas and ilis kupoos [sections of land] on which the waters originated making it possible for the industry to privately control most surface water sources; the Court said a water right gave the holder the power to divert the water to wherever he chose, a power crucial to sugar because most of the fields needing irrigation are distant from the water sources; adverse possession (technically here "prescription") of water rights became possible, making the stealing of a water right legal if you get away with it long enough; and early case references to riparian rights were in time weeded out or forgotten, and in any case never allowed to mature into a full-blown riparian system. Such a system, with its requirement that no one may divert outside the watershed nor take more water than would substantially diminish the natural flow of the stream, was anathema to sugar.<sup>13</sup>*

There were small but important rulings for riparian rights. There was a series of cases on Maui from 1902 to 1904, for example, which determined that HC&S could not deprive Wailuku Sugar of water in the lowlands. On Kauai, disputes over the water of the Hanapepe River led to a divided Hawaii Supreme Court decision in *Territory v. Gay* in 1930, which found that the upper 'ili did not have greater rights than a lower 'ili.<sup>14</sup> But the most important water cases occurred long after most water diversions were in place. And these were not between Hawaiian landowners or tenants and the sugar companies, but rather between two sugar companies in one case (the McBryde Decision) and between farmers and the Board of Water Supply in the other (the Reppun Decision).

The next great change in water use and rights occurred after World War II. During the 1940s Hawaii saw the increase of the military presence, tourism, and urban population. As Hawaii became less and less dependent on the sugar industry as the only source of income, the exclusive power it had enjoyed for decades began to wane. And with that loss of influence, it was natural that the industry's apparent absolute grip on water would be rethought.

There was again a shift in government's priorities for water and, not coincidentally, the makeup of the courts. This shift became even more pronounced after statehood, which brought significant changes in the composition of the Supreme Court. It was no longer dominated by justices with interests sympathetic to sugar. The new court shifted its emphasis to acknowledge some basic Hawaiian concepts of water law by way of two landmark cases: McBryde and Reppun.

*McBryde Sugar Co. v. Robinson*, also known as the Hanapepe Case,<sup>15</sup> brought up issues of water and the public trust. In 1973, the Supreme Court handed down what is generally accepted as Hawaii's most significant water decision in the twentieth century, known as the McBryde Decision. The con-



Nawiliwili with rice fields, 1913. For fifty years rice was the second-largest export after sugar. Ninety percent of Hawaii's rice was grown on Kauai and Oahu. Rice fields covered almost all of Kauai's lowlands, as well as the plains from Punchbowl to Diamond Head. (Photo: L. W. Hart. Private collection.)

ward, and from the public to the private. For years the Hawaiian government and then later the territorial government shared common goals with the sugar industry. During the territorial period, both the governor and justices of the Supreme Court were appointed by the U.S. president. Consequently, from 1900 to 1959, the Hawaii Supreme Court was composed of lawyers drawn from the prominent business interests whose commercial philosophy they upheld. As George Cooper summarized in his 1978 paper on the history of water rights:

*The Supreme Court in its approximately 50 water rights decisions prior to McBryde in 1973 has a rather perfect record of developing the law in ways conducive to sugar's*

and the pipes none at all from leakage."<sup>6</sup> The ditch was not completed until the last days of the deadline imposed by the government lease—on 30 September 1878—by which time it had been extended to Nailiilihale stream, intercepting the Kailua, Hoalua, Huelo, Hoolawa, and Honopou streams as well as smaller streams along the way. The costs of water projects in Hawaii were consistently underestimated, and Alexander's estimate was no exception. The length of the new ditch was only 17 (not 25) miles; its cost was \$80,000 (not \$30,000).

Besides the hazard of spanning Maliko gulch, Baldwin and Alexander were facing equally fearsome obstacles on the political front. There was no greater challenge than that posed by Claus Spreckels, who was to build the Haiku (Spreckels) Ditch. Claus Spreckels came to the Kingdom of Hawaii in 1876. He controlled the sugar refinery operation on the West Coast and hoped to gain control of the cane production side of the industry as well. He became friend and adviser to King Kalakaua, aligning himself with the king against the emerging sugar planters. Spreckels granted loans to the financially overextended monarch. Control of water on East Maui quickly became the focus of a dramatic struggle pitting King Kalakaua and Claus Spreckels against Sam Alexander and Henry Baldwin.

In 1878, Spreckels acquired lands on the central Maui plains to start a new sugar plantation. He bought an undivided interest in 16,000 acres of the Waikapu Commons from Henry Cornwell and leased 24,000 acres of adjacent Wailuku Commons crown lands from the government for \$1000 a year. Several years later, through a process that smacked of corruption and deals, the legislature granted these lands to Spreckels in fee.

Spreckels lost no time petitioning the government for water rights to irrigate his new plantation. Kalakaua, in one of the most controversial acts of his reign, and after a late-night meeting with Spreckels and others in a hotel, sent a messenger at two in the morning dismissing his cabinet and installing a new one. This new cabinet granted Spreckels his water rights the following week. A loan from Spreckels to the king was executed that same day.

A most revealing provision of the lease gave Spreckels the right to all water not already in use at a certain date (30 September 1878)—a date that corresponded with the completion requirement date for the Hamakua Ditch. This meant that if Alexander and Baldwin's Hamakua Ditch was not finished on schedule, Spreckels could lay claim to that water and possibly the Hamakua Ditch as well. Considering the delays being encountered at Maliko gulch, this was a good possibility. Nevertheless, the Hamakua Ditch was finished in September 1878, a few days within the time limit set by the lease. Alexander and

**Table 4 (cont.)  
Plantations and Ditches**

<i>Plantation and ditches</i>	<i>Date</i>	<i>Average flow (mgd)*</i>	<i>Capacity (mgd)</i>	<i>Comment</i>
Kamananui Ditch	1904			
Ito Ditch	1911			
<i>Kabuku Plantation Co.</i>		10†		
Punaluu Ditch	ca. 1906	10		
<i>Waimanalo Sugar Co.</i>				
Kailua Ditch				
Maunawili Ditch				
<b>Maui Plantations</b>				
<i>East Maui Irrigation Co.</i>		160†	440	
(Old) Hamakua Ditch	1878	(4)		Built by HDC
(Old) Haiku (Spreckels) Ditch	1879			Built by C. Spreckels
Lowrie Ditch (Lowrie Canal)	1900	(37)	60	Built by HC&S/MA
New Hamakua Ditch	1904	(84)		Built by MA
Koolau Ditch	1905	(116)	85	Built by HDC
New Haiku Ditch	1914	25	100	Built by HC&S/EMI
Kauhikoa Ditch	1915	(22)	110	Built by MA
Wailoa Ditch	1923	(170)	160– 195	Built by EMI; originally 160 mgd, later 195
<i>Wailuku Sugar Co.</i>		30†		
Waihee (Spreckels) Ditch	1882	10–2	20	Built by C. Spreckels; average is dropping
Waihee (Ditch) Canal	1907	27	50	Average is dropping
Nine other smaller ditches				
<i>Honolua Ranch &amp; Pioneer Mill Co.</i>		50†		mgd and average to 35 mgd
Honokohau Ditch	1904	20	35	Developed by Honolua Ranch, now ML&P; replaced by Honolua Ditch
Honolua (Honokohau) Ditch	1913	30–18	50– 70	
Honokowai Ditch	1918	6	50	Replaced 1898 flumes
Kahoma Ditch		3		
Kanaha Ditch		3.8		
Kauaula Ditch		4.5	25.5	Upgraded in 1929

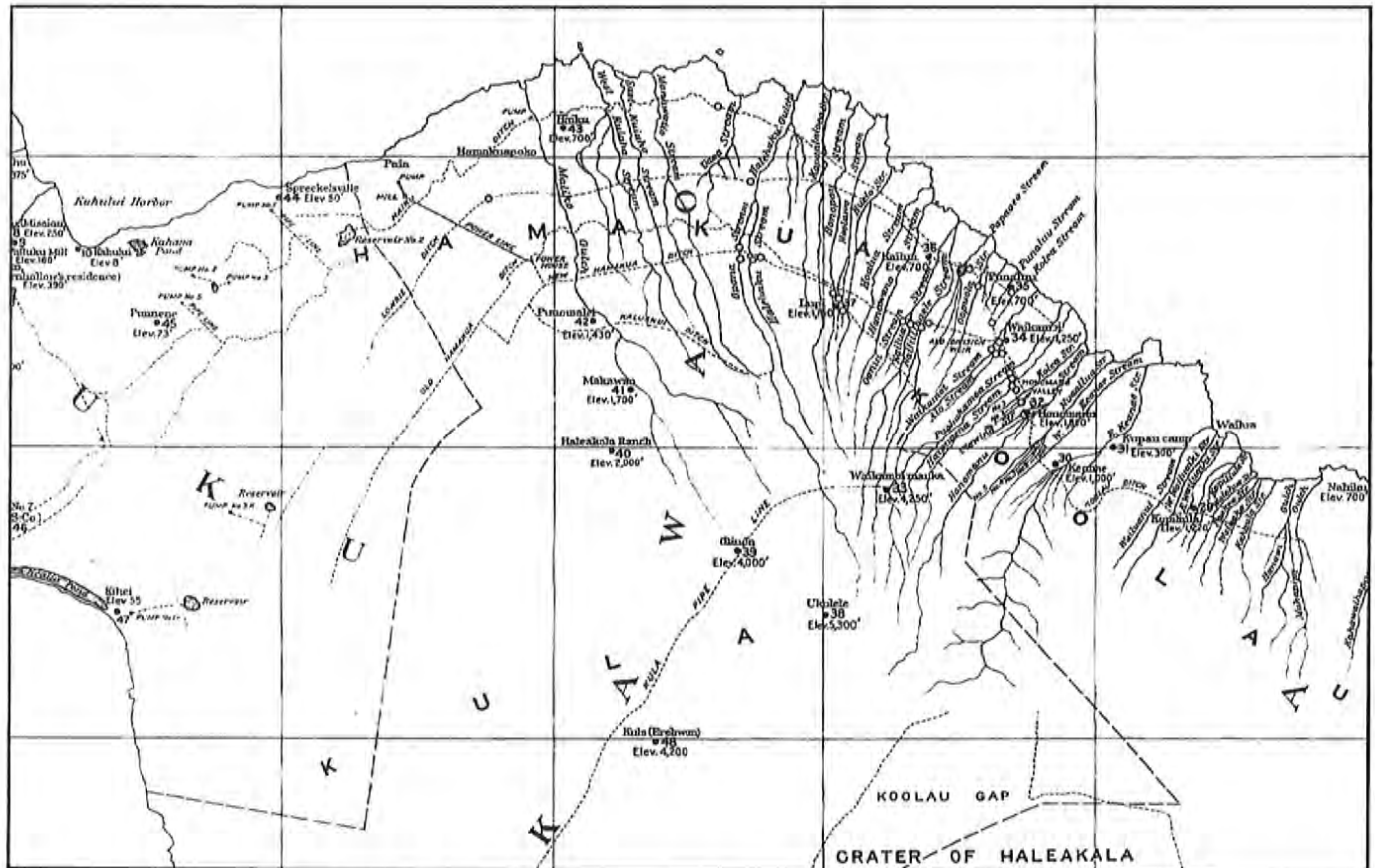
## 8. East Maui

### EAST MAUI IRRIGATION COMPANY

The alphabet soup of Hawaii's companies gets especially thick on Maui. Samuel Alexander and Henry Baldwin were the founders of Alexander & Baldwin (A&B) and East Maui Irrigation Company (EMI). These two men started their illustrious career together in an informal partnership in 1869 with the purchase of 11.94 acres of Bush Ranch. In 1876 they formed the Hamakua Ditch Company and in 1878 completed the Hamakua Ditch—not to be confused with the 1904 Hamakua Ditch Company on Hawaii, which later changed its name to Hawaiian Irrigation Company, or that company's Upper and Lower Hamakua ditches.

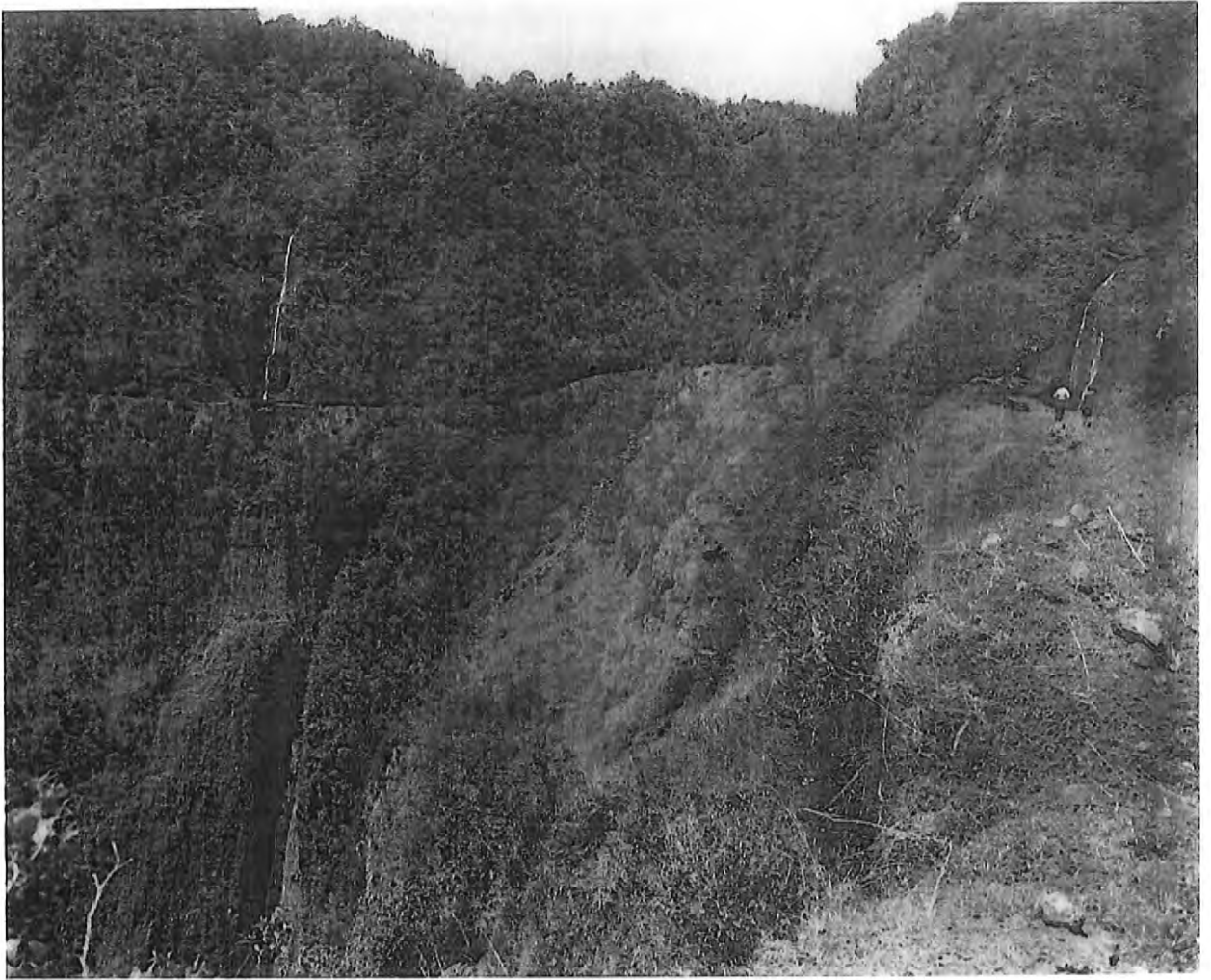
During the ensuing decade Alexander and Baldwin's plantation was incorporated as the Paia Plantation and included Haliimaile Plantation (Grove Ranch), East Maui Plantation, and Seaside Farm. The agency of Alexander & Baldwin was established in 1894. The corporate partners gained control of Hawaiian Commercial and Sugar Company (HC&S) in October 1898, and Alexander & Baldwin then became agent for HC&S. It was a meteoric rise for the two men—from the new firm of Alexander & Baldwin, which had posted a net profit of \$2627.20 in 1895, to A&B, Ltd., which had accumulated assets of \$1.5 million at the time of its incorporation in 1900.

Immediately on acquiring HC&S, the partners started the Lowrie Ditch—also known as the Lowrie Canal—which started in the rain forest of Kailua in Makawao district. The ditch had two sources. The first was a reservoir at Papaaea that was fed by two five- to six-mile ditches. The second source was Kailua stream where the diversion intercepted the source of the older Haiku Ditch and ran parallel to that ditch. (The old Haiku Ditch was abandoned between 1912 and 1929.)



1913 drainage map, East Maui. (USGS.)

The ditch was named after William J. Lowrie, manager of HC&S's plantation and mills at Spreckelsville. It was designed by engineer E. L. VanDerNeillen and supervised by Carl Jensen, who was reported in 1900 to be on his way to his "old home" in Denmark to recuperate. The work was done by Japanese laborers "under the supervision of one of the brightest Japanese in the Islands." Contracts were signed in July 1899; the work was finished in September 1900; the cost was \$271,141. With a capacity of 60 mgd, it was capable of irrigating 6000 acres. This 22-mile system was three-quarters open ditch and included these elements: seventy-four tunnels for a total of 20,850 feet, the longest being 1955 feet; nineteen flumes for a total length of 1965 feet; and twelve siphons with a total length of 4760 feet, the biggest being 250 feet deep



Ditch trails such as this one in the back of Honomanu Valley, Maui, reached into many pristine Hawaiian valleys to access ditches and tunnels. (Photo: D. Franzen.)

at Halehaku gulch. This ditch, by means of inverted siphons, ended at the 475 foot elevation, 257 feet above the Haiku Ditch.<sup>1</sup>

The next big project for the Hamakua Ditch Company was the Koolau Ditch, built in 1904–1905 under engineer M. M. O'Shaughnessy. The Koolau Ditch extended the water collection system another 10 miles toward Hana, around the Koolau Range to Makapipi, in 1904. The cost of Koolau Ditch was \$511,330. Its capacity was 85 mgd. This ditch traveled through more difficult

terrain than most other systems, and it presented greater logistical problems. O'Shaughnessy reported:

*The country was so steep and precipitous that little ditching could be employed, and it was necessary to make four and one-half miles of wagon road and eighteen miles of stone paved pack trails to facilitate during construction the transportation of supplies. About 4000 barrels of cement and 100,000 pounds of giant powder were used. In all ten mountain streams are intercepted, which are admitted into the main aqueduct through screens of grizzly bars spaced three-quarters of an inch apart.<sup>2</sup>*

There were 7.5 miles of tunnel and 2.5 miles of open ditch and flume. The thirty-eight tunnels, all dug out of solid rock, were 8 feet wide and 7 feet high. In length they averaged 1000 feet: the shortest was 300 feet and the longest 2710 feet. A total of 4.5 miles of 6-inch-thick concrete lining was used in the tunnels:

*The work was all done by Japanese with hand drills; ore cars were employed in moving the excavated materials, and it has cost finished about \$7 per lineal foot. The Japanese make excellent miners and rock men, and, owing to their small size, it was practicable to work four in a face, and, by working three 8-hour shifts, the whole work had to be completed in 18 months from the date of commencement, April, 1903.<sup>3</sup>*

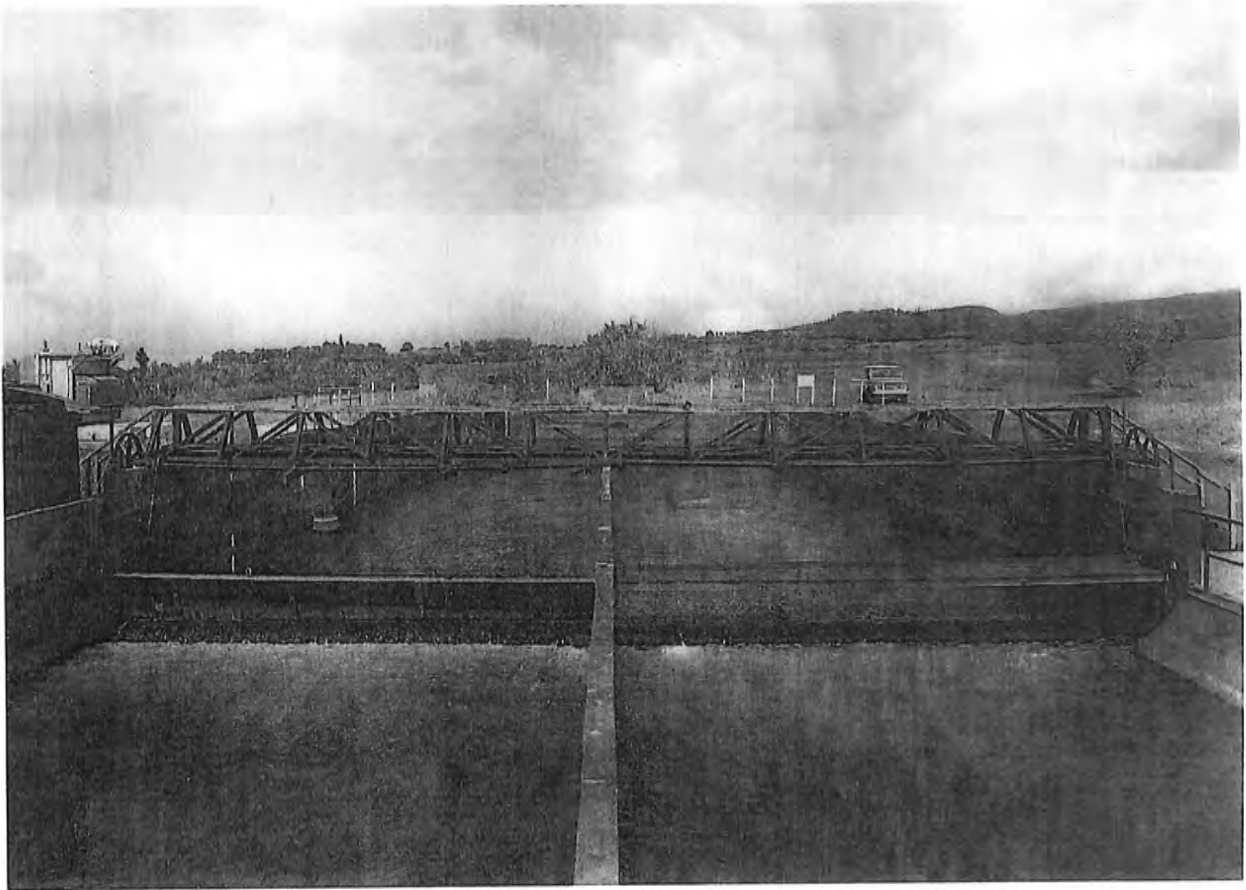
The Koolau Ditch was later turned over to EMI, who lined and improved it at a cost of \$385,117. Originally it fed into the New Hamakua Ditch at Alo, but it was connected to the Wailoa Ditch upon its completion in 1923.

On 23 June 1908, Alexander & Baldwin formed the East Maui Irrigation Company to succeed the 1876 Hamakua Ditch Company. Its purpose was to develop and administer the surface water for all the plantations owned, controlled, or managed by Alexander & Baldwin. The EMI boundaries were from Nahiku to Maliko gulch and included all the area where surface water was developed. West of Maliko gulch was HC&S. In that same year, A&B gained control of Kihei Plantation.

Ditch building continued apace under the newly formed company. The New Haiku Ditch was completed in 1914 with a capacity of 100 mgd. It was mostly tunnel, partially lined, with a length of 54,044 feet. Kauhikoa Ditch was completed in 1915 with a capacity of 110 mgd and a length of 29,910 feet. Wailoa Ditch was started in 1918 and finished in 1923. Mostly tunnel, all lined, with a length of 51,256 feet, it had an original capacity of 160 mgd, later increased to 195 mgd. Once the ditch systems were completed, EMI then turned to building water development tunnels.

EMI's collection system had 388 separate intakes, 24 miles of ditch, 50 miles of tunnels, and twelve inverted siphons as well as numerous small





The Wailoa Canal has a greater median flow than any river in Hawaii. Water collected here at the Wailoa forebay drops through a low-head 500-kilowatt hydroelectric powerplant. (Photo: D. Franzen.)

feeders, dams, intakes, pipes, and flumes. Supporting infrastructure included 62 miles of private roads and 15 miles of telephone lines. The water source was primarily surface runoff from a total watershed area of 56,000 acres. Of this watershed, EMI owned 18,000 acres—the 38,000-acre balance belonged to the State of Hawaii. The state issued four licenses, named Huelo, Honomanu, Keanae, and Nahiku, to EMI for water arising on government land. Each license was initiated at a different time and dealt with differing conditions. The value of the water was determined by its accessibility and distance from fields, and the price was tied to the price of sugar. The state's share was determined by the percentage of rain falling on government land.



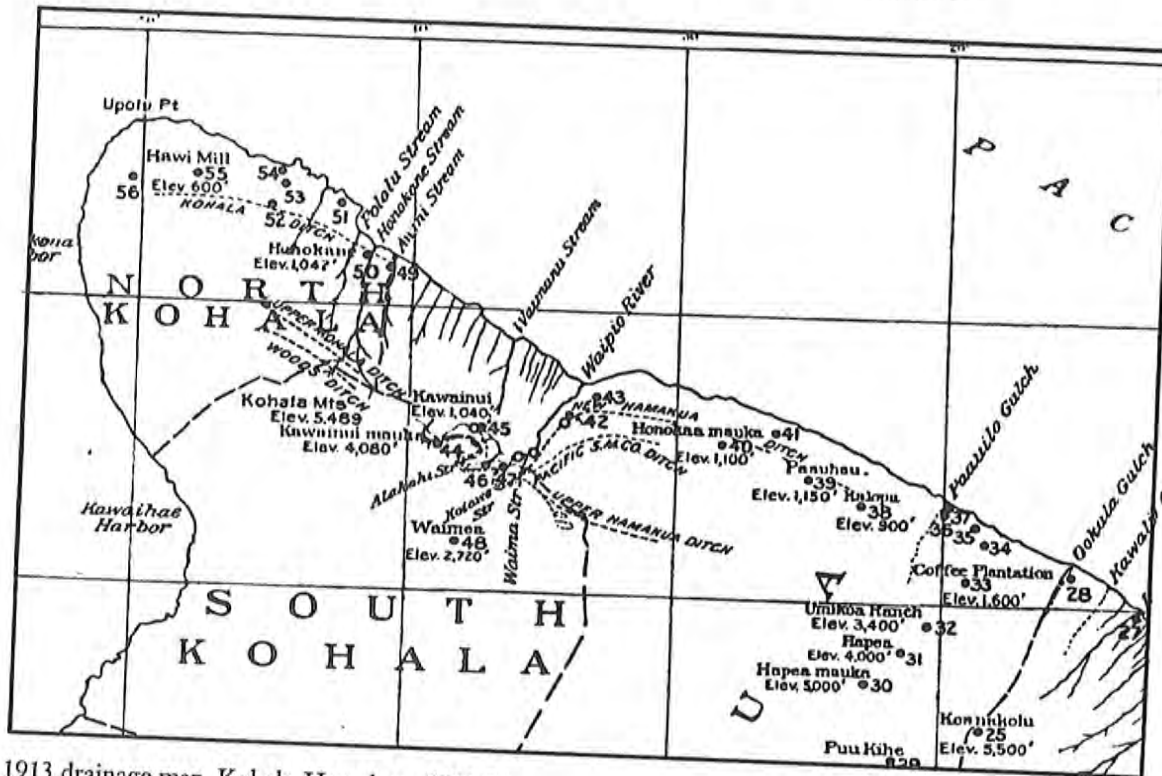
mgd. Thus, as in many of Hawaii's plantations, groundwater was a major source of supplemental irrigation water.

By 1931, HC&S was able to pump 144 mgd. To accomplish this it relied on deep and powerful pumping stations. Station 2 had equipment at 119 feet; Station 3, called Kihei A&B, had an underground chamber at 300 feet. The deepest was pump 18 at 500 feet. In dry times, pumps supplied up to 45 percent of the irrigation water. Pump 7, which struck water at approximately 125 feet, had a capacity of 40 mgd, and in 1931 was the most powerful pump in the world. It is one of several designated as "Maui-type basal water tunnel," which used a skimming tunnel to collect fresh water off the top of the basal lens. HC&S also received West Maui water from the Waihee Canal and Spreckels Ditch through agreements with Wailuku Sugar Company. By 1931, HC&S was producing about 32 percent of Hawaii's total sugar crop.

Maui Agricultural Company was formed in 1921 by the merging of seven small East Maui plantations: Haiku Sugar Company, Paia Plantation, Kailua Plantation, Kula Plantation, Makawao Plantation, Pulehu Plantation, and Kalialinu Plantation. HC&S, based in Puunene, and Maui Agricultural Company, based in Paia, merged in 1948, at which time Alexander & Baldwin owned about 35 percent of the stock of each company. This merger consolidated all of A&B's sugar plantations on Maui under HC&S. In 1962, HC&S merged with and became a division of Alexander & Baldwin, and EMI became a subsidiary of A&B.

EMI currently has four parallel levels of water development ditches, running from east to west across the East Maui mountains. From *mauka* to *makai* these are the Wailoa, New Hamakua, Lowrie, and New Haiku ditches. The Lowrie runs at a considerably lower elevation than the Wailoa, taking advantage of groundwater development between the two. Wailoa and Lowrie run all the time; New Hamakua and New Haiku run on surplus water from the other ditches or for delivery to the fields. Little remains of the early Hamakua and Haiku (Spreckels) ditches.

The last of the four state-issued water licenses to EMI expired in 1986. A&B and EMI alternately hold revocable year-to-year permits from the State of Hawaii at flat monthly rates.



1913 drainage map, Kohala-Hamakua. (USGS.)

of Brooklyn, New York, to again evaluate the possibility of bringing water out of the Kohala-Hamakua watershed. The Tuttle Report was completed in 1902. In Tuttle's opinion, the project was feasible.

As a result of the Tuttle Report's findings, two ditch companies were formed. The Kohala Ditch Company, established in 1904, built the Kohala Ditch. The Hamakua Ditch Company, formed around 1906, built the Upper and Lower Hamakua ditches (not to be confused with the Hamakua Ditch Company, started on Maui by Alexander & Baldwin, or with their 1878 Hamakua Ditch).

On 12 March 1904, J. S. Low acquired a license from the Territory of Hawaii for a period of fifty years to "enter upon, confine, conserve, collect, impound and divert all the running natural surface waters on the Kohala-Hamakua Watershed," a license that he assigned to the Kohala Ditch Company (KDC). The license stipulated that Low service all requesting customers.

(COPY)

AGREEMENT BETWEEN HAWAIIAN DITCH COMPANY AND HAWAIIAN GOVERNMENT

DATED: SEPT. 13, 1876

AN INDENTURE made and concluded this 13th day of September A.D. 1876 by and between William L. Moehonua Minister of the Department of the Interior of the Kingdom of the Hawaiian Islands of the first part and the Haiku Sugar Company a corporation established under the laws of the said Kingdom and Samuel T. Alexander and Henry P. Baldwin doing business as co-partners on the Island of Maui in said Kingdom under the firm name of Alexander and Baldwin and James M. Alexander of said Island of Maui and Thomas H. Hobron of the City of Honolulu, in the Island of Oahu in said Kingdom of the second part. Whereas the said parties of the second part being desirous of using for irrigation and otherwise the water of certain streams hereinafter named by conveying the same by means of a ditch canal pipe aqueduct or other watercourse by them to be constructed over certain lands situate on said Island of Maui and amongst them certain lands of the Hawaiian Government have recently applied to the said party of the first part and requested him that they be secured by the authority of the Hawaiian Government on such terms and conditions as it may deem just to grant unto them the right to take, draw off and use the water of said streams for their own use for purposes of irrigation or otherwise and the right to enter into Government Lands and to dig and construct there-in a water-course whereby to conduct over them the water of said streams and to continue, maintain and repair such water course with full right of egress and ingress upon and out of said lands at any and all times while and so long as the right to use said water shall be granted to them.

AND whereas the said Minister of the Department of the Interior by consent of the King in Cabinet Council has power to sell lease or otherwise dispose of the public lands and other property in such manner as he may deem best for the promotion of agriculture

**EXHIBIT**

E-93

and the general welfare of the Kingdom, provided that no sale of any land or lot exceeding Five Thousand Dollars in value shall be made without the consent of the King in Privy Council

AND whereas the water of the said streams has from time immemorial flowed off into the sea and thereby become useless for irrigation or other purposes and it would promote the general welfare of the Kingdom and its agriculture if the same were utilized as aforesaid

AND whereas the Hawaiian Government is not now ready or willing to incur the expense and undertake the labor of constructing such water course.

Now therefore this INDENTURE WITNESSETH that in consideration of the premises and also of the sum of One Hundred Dollars, paid before the signing and ensembling of these presents by the said parties of the second part to the said parties of the first part for the use of the Hawaiian Treasury the receipt whereof is hereby acknowledged and in further consideration of the promises, covenants and undertakings hereinafter mentioned on the part of the said parties of the second part by them to be kept and performed, He the said William L. Keohoua, Minister of the Department of the Interior of the Kingdom of the Hawaiian Islands by and with the consent of the King in Cabinet Council and by virtue of the authority by law in him vested, doth hereby covenant and grant with and to the Haiku Sugar Company, Alexander and Baldwin, James M. Alexander, and Thomas H. Hobron and their respective successors, representatives and assigns that it shall be lawful for them and their agents and servants and all and every person and persons for the benefit and advantage of them the said parties of the second part and of their respective successors, representatives and assigns from time to time and at all times during the term of twenty years next ensuing

after the date of these presents (except as hereinafter provided) to take, draw off, conduct away and use for their own purposes of irrigation or otherwise the water in and from those certain streams and sources of water situate in the District of Hamakualoa in said Island of Maui, known as Nailililinaile, Kailua, Huelo, Holaua, and Honopou and to conduct and cause said water to flow through any watercourse from the said streams or sources of water or any part or portions thereof and over any and all lands of the Hawaiian Government situate in said Island of Maui (except as hereinafter provided) over which it may be for the convenience or interest of the said parties of the second part, their successors, representatives and assigns to conduct or cause said water to flow for their use and purposes as aforesaid and to enter into and upon and pass and repass and dig up said lands and any part thereof in order to construct, maintain, repair, replace and keep in order and use such watercourse and to do all such acts in and upon said streams and sources of water and lands as shall or may be necessary in order to convey and use the water of said streams and sources of water PROVIDED NEVERTHELESS and the continuance of the right herebefore granted is upon this condition the said water course shall be constructed by the said parties of the second part within two years from the date hereof and that existing rights or present tenants of said lands or occupiers along said streams shall in no wise be lessened or affected injuriously by reason of anything hereinbefore granted or covenanted and that the said parties of the second part their successors, representatives and assigns shall pay unto the said party of the first part and his successors the sum of One Hundred Dollars during each and every year in which they shall use the said water as aforesaid by authority of these presents which said sum shall be payable in advance on the first day of October in

each of said years and also reserving and excepting unto the said party of the first part and his successors the right to conduct water or to grant to any other person or persons, corporation or corporations the right to conduct water from said streams and sources of water or from any other streams or sources of water over said lands in such manner and to such extent only as shall not diminish or interfere with the supply or use of the water as hereinbefore granted and secured to the said parties of the second part or impair or render less useful to said parties of the second part their successors, representatives or assigns the use and enjoyment of said water course and water. And further provided and it is hereby further agreed that at any time after the King in Privy Council shall have approved of the report of the Commissioners to be appointed under the provisions of An Act "To Develop the Resources of the Kingdom" approved on the 25th day of September A.D. 1876 defining and setting forth a plan to develop the resources of the Island of Maui but more particularly in the reference to the Districts of Koolau, Hamakua, Makena and Kula or any of them the said party of the first part and his successors may purchase of the said parties of the second part their successors, representatives and assigns all the material used in constructing said water course and all the right, title and interest, of them, and every of them in and to the same and also may discontinue all the rights of water and way hereinbefore granted upon payment of such sum of money as the construction of such water course and material used therein shall have cost to the completion thereof and in addition to such payment agreeing thereafter to furnish said parties of the second part their successors, representatives and assigns with water through such water course or otherwise in such quantities as may be required by them to irrigate their respective lands (not exceeding in amount that to which a right is hereinbefore granted)



provided such quantity shall flow in such water course or otherwise from said streams but not for a longer period than the unexpired term hereof and upon such just and reasonable annual rates as shall in no case exceed the rates paid by any other parties for such water nor in any case during the unexpired term of this grant shall such annual rates exceed five dollars per acre to the grantees or their respective successors, representatives or assigns for land irrigated.

AND it is further agreed that if at the end of said term of twenty years the rights hereinbefore granted shall be granted to any person or persons corporation or corporations by said party of the first part or his successors they shall be offered to be renewed and continued (on like terms and conditions with those herein named) unto the said parties of the second part their successors representatives and assigns for a further term of twenty years. And the said parties of the second part for themselves and their respective successors, representative and assigns, covenant with the said party of the first part and his successors that they will pay said sum of One Hundred Dollars annually as aforesaid and that they will complete said watercourse within two years from date hereof or forfeit and surrender all rights hereinbefore granted unto them, and that in constructing, maintaining or replacing said watercourse that they will do no unnecessary damage to said lands.

IN WITNESS WHEREOF the said William L. Moehonua as Minister of the Interior party of the first part and the said Haiku Sugar Company by its President and Secretary and the said Samuel T. Alexander and Henry P. Baldwin and the said James L. Alexander and the said Thomas H. Hobron parties of the second part have herein set their respective hands and seals the year and day first above named.

William L. Moehonua  
J. Mott Smith Pres. Haiku Sugar Co.  
Jos P. Cooke Secy. " " "  
Alexander & Baldwin per H.P. Baldwin  
James M. Alexander  
T. H. Hobron by his atty. in fact  
HCS-MTREQUEST-01-00005

## Appendix 1: Letter from the Attorney General (1876)

**Letter from Attorney General William R. Castle to His Excellency Wm. L. Moehonua, Minister of the Interior, dated 7 September 1876:**

Sir:

The application of Messrs Castle and Cooke, representing the Haiku Sugar Company, Alexander and Baldwin, James M. Alexander, the Grove Ranch Plantation and Capt. Thos H. Hobron, dated August 21, 1876, has been placed before me. This application requests permission to take water from several streams, in Koolau Maui, to be carried to their respective sugar plantations, for purposes of irrigation.

So far as I am informed, this application is new, in its nature. It is not for land, nor, as I understand, for an absolute sale or grant of the waters of the streams mentioned in the application. The application is for a license; the license to take and use water, conveying the same in part over several government lands.

Several questions are suggested upon the matter, of which the more important appear to be:

1st. Has the Minister of Interior the power and authority to make such a grant?

2nd. What can be conveyed or granted? &

3rd. Is the use asked by the application contemplated by our law?

Upon these questions, my opinion is as follows.

The great act of 1848, confirming the gift of lands to the people, as made by Kamehameha III, confers upon the Minister of the Interior, full power to direct, superintend and dispose of said lands; provided however that the terms and conditions of sale should be approved by the King in Privy Council. No

further provision or restriction was made by law till the year 1859 when the Civil Code was published as then revised and became the law of the land. Sections 39 to 48 inclusive refer to government lands and kindred property. Section 42 expressly provides that "by and with the authority of the King in Cabinet Council" he shall have "power to lease, sell or otherwise dispose of the public lands and other property in such manner as he may deem best for the promotion of agriculture and the general welfare of the kingdom, subject however to such restrictions as may from time to time be expressly provided by law." By the terms of section 40, "streams, ponds, springs, watercourses" &c constitute part of such property. Section 48 prohibits said Minister from disposing of certain springs and ponds near Honolulu, and all other government water ponds, springs and streams "which may be valuable for public use." By the laws of 1874, chapter 24, the Minister is prohibited from selling any land the value of which is over \$5,000 without the consent of the King in Privy Council. No other laws have been passed affecting the question. Subject therefore to the provisions of these sections read together, the Minister of the Interior has full power to make the grant asked, for it will be seen that the law of 1874 does not apply. For the purposes of the case in hand, it needs only the consent of the King in Cabinet Council. It may be claimed that the provisions of section 48 prohibit the disposal of the water asked for. The answer to this is—that as there are no cities, towns or villages, and at best but a very sparse population in that region and the waters from time immemorial run waste into the sea there can be no public use for which they are so valuable as to prevent a disposal. In addition to which, the provisions of section 48 probably apply only to absolute alienations of title.

The application asks for the right to take water. It asks a grant of a license which may be made by deed of lease.

The answer to the third question seems to me to be very clear. It is asked that water be taken for the purpose of irrigation, in short—for the uses of agriculture—an interest particularly specified as one which the government should foster and encourage and for which a disposal of the public property may be made. The Reciprocity Treaty having passed and a brighter future opening for the country, it becomes the duty of the Government to aid and foster in every possible way the agricultural interests of the country upon which our prosperity mainly depends. In offering and furnishing such aid anything like a monopoly must be guarded against. The government acts for all parties and should endeavor to distribute equally whatsoever of favor it may have, or, as in this case—when no favor is asked but a license is requested—to guard against any injury to private rights by the establishment of any monopoly. At some future

day the government—as is the case in some of the European nations—may undertake the work of carrying water from place to place as the country may need, but at present is not prepared to engage in any such development of internal resources, and for such water may demand a reasonable compensation. Its ponds, springs and streams are valuable and should be guarded and protected. Until the government is ready to undertake such work—no obstacle should be thrown in the way of others, who are able and ready to commence such work. It seems a fit and proper thing to grant the application made by Messrs Castle and Cooke, reserving certain rights to the government, as will be hereinafter specifically set forth. The applicants propose to begin work immediately, the (*sic*) have already gone to considerable expense—as I am informed in surveys &c. At present, of course, the work is largely experimental—if successful it will largely increase the value of their lands—as well as those adjoining. In this the whole nation will join indirectly and it is but just that very liberal terms should be made. It is desired to begin at once. For the purpose of allowing that, I would suggest that an answer be sent to Castle and Cooke, immediately containing the following conditions and terms.

The Government will grant to the Haiku Sugar Company, Alexander and Baldwin, James M. Alexander, the Grove Ranch Plantation and Captain Thos H. Hobron and their respective successors, heirs and assigns, the license to take water from the streams named in the application and to carry the same over all government lands intervening between the said streams and the remotest land to which it is *now* desired to carry said water, for the period of twenty years from date of acceptance of these terms, at an annual rent of one hundred dollars, *Upon condition* 1st That a sufficient ditch, canal or other waterway shall be at once commenced and finished in a reasonable time. 2nd That this grant shall not interfere with the rights of tenants upon said lands or streams. 3rd nor shall it in any way affect the right of the government to grant to any person or persons the right to take water (not to interfere with the water hereby granted) from the same or other streams to be carried over the same land or lands for any purpose whatsoever, and if need be, to be carried through the ditch, canal or other waterway to be constructed by these grantees, provided however, that during the said period of twenty years the supply of water, a right to take which is hereby granted, shall not be diminished by act of the government, and 4th That at any time during said period the government may purchase the said canal, ditch or other waterway upon payment of the actual cost thereof only, and in case of such purchase, will continue to furnish water to these grantees at a just and reasonable rate not to exceed that paid by other parties taking water from such ditch or other waterway.

**Appendix**

In case such a communication is sent and accepted, all rights of the government will be reserved, the work can begin at once, and the necessary deeds drawn up in accordance with the above terms at a more convenient day.

I return herewith the application of Messrs Castle & Cooke.

I am sir most respectfully yours.

Wm R. Castle  
Attorney General

THIS INDENTURE, made this 18<sup>th</sup> day of March, 1938, by and between the TERRITORY OF HAWAII, acting by and through L. M. Whitehouse, Commissioner of Public Lands for the Territory of Hawaii, with the consent and approval of the Governor and of the Land Board of said Territory, hereinafter called the "Territory", and the EAST MAUI IRRIGATION COMPANY, LIMITED, an Hawaiian corporation, hereinafter called the "Company",

W I T N E S S E T H T H A T :

WHEREAS it is the desire of the Territory to have competitive bidding on licenses to divert water from government lands situated in East Maui; and

WHEREAS the joint use by any future Licensees of the Territory and by the Company of the aqueduct system on East Maui, Territory of Hawaii, extending from Nahiku to Honopou inclusive, which system is partly on government land and partly on Company land, will make competitive bidding possible,

NOW THEREFORE:

I.

THE TERRITORY, in consideration of the easements hereinafter granted to it by the Company and of the covenants and agreements herein contained to be observed and performed by the Company, does hereby grant to the Company a perpetual (except as to cancellation as hereinafter provided) right and easements:

(1) To convey all water now or hereafter owned by the Company and all water covered by any water license now held by the Company or which in the future may be granted to it, jointly with the Territory, without charge, through any or all aqueducts now or hereafter crossing government lands situated in East Maui

STANLEY W. FOSTER, PAUL & WIND  
ATTORNEYS AT LAW  
Honolulu, Hawaii

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EXHIBIT E-95

extending from Nahiku to Honopou inclusive; and

(2) To divert such water thus conveyed, after due allowance has been made for evaporation, leakage and seepage losses at a point or points designated by the Company, which have been or will be equipped at the Company's expense with suitable turn-out and water measuring devices, provided however, that such right and easement to convey and divert such water shall be subject to the following restrictions, to-wit:

(a) During times when the total water contributory to these jointly used aqueducts does not exceed the capacity thereof, that portion of the flow therein, which shall be considered the Company's water, is to equal the quantity of water contributed thereto from sources owned in fee and from those held under license by the Company, and the remaining water shall be considered the Territory's water;

(b) During times when the total water contributory to these jointly used aqueducts exceeds the capacity thereof, that portion of the flow therein which shall be considered the Company's water shall bear the same ratio to the total capacity thereof as the long term average water yield (as hereinafter defined) contributory thereto from sources owned in fee and held under license by the Company bears to the total long term average water yield contributory to these jointly used aqueducts, and the remaining water shall be considered the Territory's water.

## II.

THE COMPANY, in consideration of the foregoing grant and of the covenants and agreements to be observed and performed by the Territory, herein contained, does hereby grant to the Territory a perpetual (except as to cancellation as hereinafter provided) right and easement:

(1) To convey water jointly with the Company, without charge, through aqueducts crossing the Company's lands situated in East Maui extending from Nahiku to Honopou inclusive; and

(2) To divert water thus conveyed - after due allowance has been made for evaporation, leakage and seepage losses at points in said area designated by the Territory which have been equipped or will be equipped at the Territory's expense with suitable turn-outs and water measuring devices; the portion of the flow which shall be considered the Territory's water to be that specified above;

(3) To use reservoirs which are owned by the Company and are situated East of Honopou on East Maui, jointly with the Company, without charge, to the end that:

(a) Water in excess of the maximum capacity of, and otherwise contributory to, that portion of the aqueduct system crossing the drainage areas on which these reservoirs are situated, is to be conveyed jointly by the Territory and the Company into these reservoirs, in so far as this can be done by gravity using the existing aqueduct system (natural and artificial);

(b) Water in these reservoirs shall be drawn therefrom and put into that portion of the aqueduct system, which can thus be served by gravity, at a maximum rate limited either by the capacity of the reservoir outlets or the capacity of that portion of the aqueduct system into which the reservoir water is being put, so as to keep the aqueduct system flowing as nearly full as possible; the portion of the water thus drawn from the reservoirs which shall be considered the Territory's water shall bear the same ratio to the total water drawn therefrom as the long term average water yield (as hereinafter defined) contributory to that portion of the aqueduct system located on the drainage areas on



which these reservoirs are situated and derived from sources owned by the government, not then under license to the Company, bears to the total long term average water yield contributory to said portion of the aqueduct system, and the remaining portion thus drawn from the reservoirs shall be considered the Company's water.

III.

THE COMPANY, for the consideration aforesaid, does hereby agree that, in order to supplement the stream flows, it will endeavor to develop existing ground water on the Government and Company lands at Nahiku and Keanae above the existing aqueduct system by means of tunneling if in its opinion there are locations where it is feasible to develop water economically.

IV.

IT IS MUTUALLY COVENANTED AND AGREED by and between the parties hereto that:

(1) Each of the existing five licenses now held by the Company to use and convey water from government lands on East Maui shall be cancelled, and/or extended, as the case may be, so that they shall terminate on that June thirtieth nearest to the date stipulated in each respective license as the otherwise normal expiration date; and the final rental on each of these licenses shall be adjusted according to the resulting proportionate curtailment or extension of time, as the case may be;

(2) Licenses 267-B and 974 (two of the said five licenses) which overlap and have no definite line separating them shall be combined and considered under one license on and after the day following the above agreed termination by cancellation, namely on and after the first day of July, 1938.

V.

IT IS FURTHER AGREED that if the Territory, after due legal notice thereof, shall put up at public auction at least sixty days previous to its termination by the above agreed cancellation, and

thereafter at least sixty (60) days previous to its stipulated expiration, each of the aforementioned licenses (reduced to four in number) for a term of thirty (30) years, the Company agrees to bid on such licenses and offer to purchase the right to the water to be granted by any given license, providing the annual sums required to be paid by the licensee thereunder (i.e. the upset price) do not exceed the annual sums which would be required to be paid if the upset price were determined in the manner hereinafter set forth in subsections (a), (b) and (c) hereof and further providing such licenses contain provisions substantially similar to the provisions of subsections (d), (e), (f) and (g) hereof:

(a) When the average price per pound of raw sugar for a given annual payment period, July 1st to the following June 30th, inclusive, is three cents (3¢) or less, the price per million gallons of water diverted from the licensed area under consideration during the given payment period shall be that given in the price list hereinafter set forth;

(b) When the average price per pound of raw sugar for a given annual payment period, July 1st to the following June 30th, inclusive, is greater than three cents (3¢) and not more than four cents (4¢) the price per million gallons of water diverted from the licensed area under consideration during such given payment period shall be that resulting from the price given in the said price list being increased at a rate of three per cent. (3%) for every one-tenth (1/10th) of a cent the said average price of raw sugar exceeds three cents (3¢) per pound;

(c) When the average price per pound of raw sugar for a given annual payment period, July 1st to the following June 30th, inclusive, is greater than four cents (4¢) the price per million gallons of water diverted from the licensed area under consideration during the given payment period shall be that determined as above

PRICE LIST FOR WATER DIVERTED FROM EAST MAUI LICENSED AREAS

LICENSE	AREA COVERED	PRICE PER MILLION GALLONS WHEN RAW SUGAR IS THREE CENTS OR LESS PER POUND
Hahione	From Hana-Koolau boundary to Waiaka Stream	\$ .9539
Keanee	From and including Waiaka Stream to Nuaailua Stream	1.5009
Honomani	From and including Nuaailua Stream to Puohakumoa Stream	2.1043
Huelo	From and including Puohakumoa Stream to and including Honopou Stream	2.0980

(d). In the event the Company is the successful bidder on any license it shall, from March to November inclusive of each year, take all of the available East Maui water to which it has acquired a right by license and by ownership in fee, up to that portion of the capacity of the aqueduct system to which it has a right under this agreement; provided, however, if the sugar cane area irrigated by the Company's water is reduced by governmental restrictions this required minimum quantity of water to be taken by the Company may, if the Company desires, be reduced proportionately. During January, February and December of each year the Company shall take only such water as it desires. The curtailed quantity of water, resulting from either of the two foregoing reductions of water, shall be considered as having been taken proportionately from drainage areas, irrespective of whether owned by the Territory or by the Company, according to the long term average yield of each such area and such curtailed quantity of water deemed to be taken from a licensed area shall be the quantity

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ATTORNEYS AT LAW  
HONOLULU, HAWAII

constructively (according to the above proportionate plan) diverted from that area.

(e) The rental payments required to be made for each of said licenses, in the event the Company is the successful bidder therefor, shall be made semi-annually in advance on or before July 10th and January 10th of each license year, and the amount thereof shall be determined as follows:

(f) The estimated rental shall be determined for the ensuing six months on the basis of the successful bid and upon the assumption that the average price of raw sugar for said six months will be three and one-half cents ( $3\frac{1}{2}\phi$ ) per pound, and that the quantity of water diverted from the licensed area under consideration will be the long term average quantity for six (6) months diverted therefrom;

(g) Adjustment of rental shall be made within six (6) months after the expiration of the license year, June 30th, so that the resulting rental paid by the Licensee to the Territory will conform to the successful bid, average price of raw sugar for the license year under consideration and the quantity of water actually and constructively diverted during this license year from the licensed area under consideration; refunds or additional payments as the case may be will be made accordingly.

#### VI.

IT IS ALSO AGREED that:

(1) Failure to bid, by the Company, on any of the said licenses under the specified conditions shall not automatically operate as a cancellation of this agreement but such failure shall give the Territory the option of cancelling the same;

(2) Failure to put up at auction any of the said licenses at the specified time, or failure to fix the upset price in the manner herein required shall not automatically operate as a cancella-

tion of this agreement but such failure shall give the Territory the option of cancelling the same.

Company

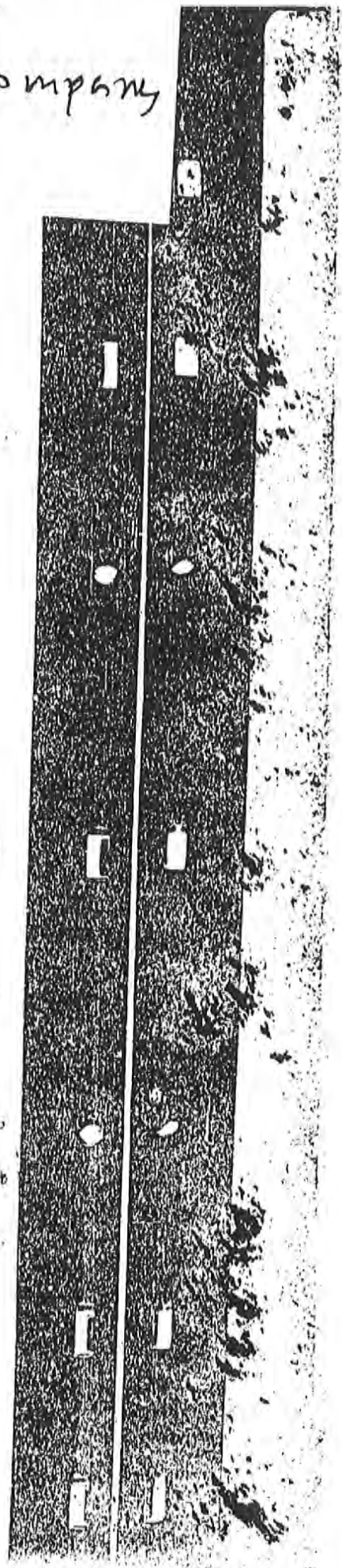
VII.

The cost of operation and maintenance of said aqueduct system shall be borne by the Territory and the Company in direct proportion to the use made thereof; that is to say, so long as the Territory has not granted a license to any one other than the Company to take and use water from any of said land or otherwise made use of any of said water, the Company shall be deemed to be the sole user of said aqueduct system and the total cost of operation and maintenance of said aqueduct system shall be borne by the Company. If, however, one other than the Company should become the purchaser of one or more of the licenses, or otherwise become the user of any of said water, then, and in that event the cost of operation and maintenance shall be borne by the Territory and the Company in direct proportion to the product of the water conveyed, and the distance through which it is conveyed through the artificial channels of said aqueduct system by each party respectively.

VIII.

WORDS AND PHRASES appearing herein shall have the following additional special meanings in so far as they apply:

- (1) "Territory" shall include its duly appointed representatives, successors, assigns, licensees and lessees;
- (2) "Company" shall include its duly appointed representatives, successors and assigns;
- (3) "Aqueduct" or "aqueduct system" shall include open ditches, tunnels, flumes, pipe lines, natural and artificial channels, reservoirs, diverting dams, gravel and sand traps, intake structures, together with regulating gates, spillway structures and water measuring devices, and shall also include roads, trails, bridges, etc., used in connection therewith;



(4) "Long term average water yield" shall be the arithmetical average annual water yield which would have been diverted from any given drainage area under consideration had the aqueduct system, at the time of the determination, been in existence during the entire period in which water records are available for such area, and shall be determined jointly by the Territory's and the Company's hydrographers based on all available applicable water measurements and long term rainfall records;

(5) "Average price per pound of raw sugar" shall mean the average of the daily full New York market price, Hawaiian basis, of ninety-six degree (96°) centrifugal raw sugar (at present officially reported from time to time by the Hawaiian Sugar Planters' Association) or its equivalent. In case there is more than one quotation of such market price during any day the arithmetical average of the quotations shall be the market price for such day. In case there is no quotation of such market price for any day then the market price for the last previous day shall be taken as the market price of any such day for which there is no quotation. The average market price for the license year, July 1st to June 30th inclusive, shall be determined by taking the arithmetical average of the daily market prices for each and every day, including Sundays and holidays, for said license year.

IX.

All matters of disagreement that may arise under this agreement which cannot be adjusted by the parties hereto to their mutual satisfaction, as well as any matter herein left to future mutual agreement at the option of either the Territory or Company, shall be submitted to and determined by three arbitrators in the manner prescribed in Chapter 116 of the Revised Laws of Hawaii 1935, as amended from time to time. In any such case either

party may give to the other written notice of the desire to so arbitrate the matter in difference and shall appoint one arbitrator in such notice, whereupon the other party shall, within ten (10) days after receipt of such notice, appoint a second arbitrator, and in case of failure so to do, the arbitrator first named shall appoint such second arbitrator, and the two arbitrators so appointed (in either manner) shall select and appoint a third arbitrator; in the event that the two arbitrators so appointed shall fail to select and appoint a third arbitrator within ten (10) days after the appointment of the second arbitrator, either party may request the appointment of such third arbitrator by the person then holding the position of First Judge of the Circuit Court of the First Judicial Circuit in the Territory of Hawaii at that time; the three arbitrators so appointed shall thereupon proceed to determine the matter in question, difference or disagreement to be determined, and the decision of any two of them, including the disposition of the costs of arbitration, shall be final, conclusive and binding upon both parties unless vacated, set aside or modified as provided by the statutes aforesaid. The arbitrators shall have the powers and duties prescribed by said statutes and judgment may be entered upon such award by said Circuit Court of the First Judicial Circuit.

X.

Nothing herein contained shall be construed to in any way affect any easement or right of way heretofore granted by the Territory to the Company.

IN WITNESS WHEREOF the parties hereto have duly executed

this instrument, in duplicate, the day and year first above written.

TERRITORY OF HAWAII,

By L. Whithouse  
Commissioner of Public Lands.

EAST HAWAII IRRIGATION COMPANY, LIMITED,

By J. Waterhouse  
Its Vice-President

By [Signature]  
Its Treasurer

APPROVED:

[Signature]  
Governor of the Territory of Hawaii.

APPROVED:

[Signature]  
Member of the Land Board, Territory of Hawaii.

APPROVED AS TO FORM:

[Signature]  
W. E. Kemp, Attorney General,  
Territory of Hawaii.



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CORPORATION

TERRITORY OF HAWAII, }  
City and County of Honolulu } ss.

On this 18th day of March A. D. 1938, before me appeared

J. Waterhouse and Jas. F. Morgan,

to me personally known, who, being by me duly sworn, did say that they are the

Vice-President and Treasurer,

respectively of East Maui Irrigation Company, Limited.

and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and the said J. Waterhouse and

Jas. F. Morgan,

acknowledged said instrument to be the free act and deed of said corporation.

*Abbie C. Sprout*  
Notary Public, First Judicial Circuit,  
Territory of Hawaii.

-TERRITORY OF HAWAII- )

: Ss

-CITY AND COUNTY OF HONOLULU- )

On this 21st day of March, A.D. 1938, before me personally appeared L. M. WHITEHOUSE, Commissioner of Public Lands of the Territory of Hawaii, to me known to be the person who executed the foregoing instrument, under his official seal, and acknowledged that he executed the same as his free act and deed as such Commissioner of Public Lands, on behalf of the Territory of Hawaii.

*Abbie C. Sprout*  
Notary Public, First Judicial Circuit, Territory of Hawaii.

-TERRITORY OF HAWAII- )

: Ss

-CITY AND COUNTY OF HONOLULU- )

On this 21st day of March, A.D. 1938, before me personally appeared J. B. POINDEXTER, Governor of Hawaii, to me known to be the person who executed the same as his free act and deed as such Governor, on behalf of the Territory of Hawaii.

*Abbie C. Sprout*  
Notary Public, First Judicial Circuit, Territory of Hawaii.

Entered of Record this 22nd day of March A. D. 1938 at 6:26 o'clock A.M. and compared. Mark H. Hickenstein, Registrar of Conveyances.

By *[Signature]* Clerk

This indenture made this 24<sup>th</sup> day of March, 1938, by and between THE TERRITORY OF HAWAII, acting by and through L. M. Whitehouse, Commissioner of Public Lands for the Territory of Hawaii, with the consent and approval of the Governor and of the Land Board of said Territory, hereinafter called the "Territory" and the EAST MAUI IRRIGATION COMPANY, LTD., an Hawaiian corporation, hereinafter called the "Company".

## W I T N E S S E T H T H A T:

Whereas, through inadvertence, the word "Territory" appears on page 8 in the fourth line of paragraph VI sub-paragraph (2) of that certain agreement dated March 18, 1938 by and between the above mentioned parties which agreement is recorded in the office of the Bureau of Conveyances, Honolulu, City and County of Honolulu said Territory and in Book 1435, pages 1 to 12, and

Whereas the parties desire to correct such error by deleting the word "Territory" and substituting in lieu thereof the word "Company".

## NOW, THEREFORE:

It is agreed by and between the parties hereto that the word "Territory" appearing on page 8 in the fourth line of paragraph VI, sub-paragraph (2) of that certain agreement dated March 18, 1938, recorded in the office of the Bureau of Conveyances said Honolulu in Book 1435, pages 1 to 12 be deleted and the word "Company" be inserted in lieu thereof.

IN WITNESS whereof the parties hereto have duly executed this instrument, in duplicate, the day and year first

above written.

TERRITORY OF HAWAII

By *[Signature]*  
Commissioner of Public Lands

EAST MAUI IRRIGATION COMPANY, LTD.

By *[Signature]*  
Its incorporated

By *[Signature]*  
Its representative

APPROVED:

*[Signature]*  
Governor of the Territory  
of Hawaii.

*[Signature]*  
Member of the Land Board,  
Territory of Hawaii.

APPROVED AS TO FORM:

*[Signature]*  
Attorney General of said Territory.

LAND LICENSE BEARING  
GENERAL LEASE NO. 3718

KNOW ALL MEN BY THESE PRESENTS:

1. That, the TERRITORY OF HAWAII, hereinafter called the "Licensor", by its Commissioner of Public Lands acting under the authority in him vested pursuant to Section 73 of the Hawaiian Organic Act and by the Revised Laws of Hawaii 1955, as amended, duly advertised and offered for sale at public auction held on \_\_\_\_\_, 1959, at the Aupuni Street side door entrance to the Territorial Office Building at Wailuku, Maui, a land license to be known as "Huelo License".

2. That, at said auction sale, \_\_\_\_\_, of \_\_\_\_\_, hereinafter called the "Licensee", was then and there the highest bidder therefor having bid the sum of \_\_\_\_\_ DOLLARS (\$\_\_\_\_\_) for the annual fee for said license.

3. That, the Licensee did thereupon pay to the Licensor pursuant to the terms and conditions of such sale: (a) the sum of \_\_\_\_\_ DOLLARS (\$\_\_\_\_\_) being the first semi-annual payment of said annual fee, (b) the expenses in connection with sale in the sum of \_\_\_\_\_ DOLLARS (\$\_\_\_\_\_), and (c) the sum of TWENTY-FIVE THOUSAND AND 00/100 DOLLARS (\$25,000.00), being one half of an annual estimated rental of FIFTY THOUSAND AND 00/100 DOLLARS (\$50,000.00) for water diverted from the licensed premises, computed upon the basis of

*Final Copy issued by Land Commissioner Husted  
As advertised and on file at Maui Land Agents office.*

**EXHIBIT E-96**

an assumed average annual yield of 14,060 million gallons at \$3.556 per million gallons.

4. NOW, THEREFORE, in consideration of the foregoing and of the terms, conditions, covenants and agreements hereinafter contained and on the part of the Licensee to be observed and performed, the Licensor hereby grants to the Licensee a license for the right, privilege and authority to enter and to go upon government land on the Island of Maui, Territory of Hawaii, between and including Puohokamoa and Honopou streams and tributaries, in the districts of Koolau and Hamakualoa, and extending from the sea on the north to the land of Haiku Uka, Hamakualoa on the south, as shown in yellow on the plan attached hereto and made a part hereof, and hereinafter referred to as the "Licensed Area" and, subject to controlling provisions of existing laws relating to withdrawals, to thereupon:

5. Develop ground water within the Licensed Area by the construction of tunnels, shafts, wells, pumps, etc., at locations approved by the Licensor.

6. Divert by means of aqueducts or aqueduct systems now or hereafter situate on the Licensed Area government owned surface water from all streams in the Licensed Area and such government owned ground water as may be developed as aforesaid, except, however, such water as is used for domestic purposes (including the watering of livestock), under the provisions hereinafter contained, or for domestic purposes and the irrigation of kuleanas entitled to the same.

7. Use government owned water so diverted for the

Licensee's own purposes or for sale to others, including use of such water for the development of electrical energy for its own use or for sale.

8. Use the Licensed Area for sites for hydro-electric power plants and rights-of-way for transmission lines to transport electrical energy, such sites and rights-of-way to be at locations approved by the Licensor.

9. Use, operate and maintain on the Licensed Area, jointly with the Licensor and with others now or hereafter holding under the Licensor as provided in that certain agreement between the Territory of Hawaii and East Maui Irrigation Company, Limited, dated March 18, 1938, recorded at the Bureau of Conveyances in Honolulu, Territory of Hawaii, in Liber 1435, Pages 1-12 and corrected by correction agreement, dated March 24, 1938, recorded at the Bureau aforesaid in Liber 1435, Pages 269-271, hereinafter referred to as the "East Maui Water Agreement", the existing aqueduct system and all extensions thereof which now or hereafter cross government lands situated in East Maui extending from Nahiku to Honopou inclusive, together with the right to construct, at locations approved by the Licensor, any and all such extensions for the conveyance and control of water granted under this license and also of other water now or hereafter owned or controlled by the Licensee.

10. Pass and repass over the Licensed Area, but in a manner such as will interfere as little as practicable with the full use of such area by present and future lessees and licensees of the Licensor, and will avoid destruction or injury to the forest growth as far as is practicable; and in further-

ance of the proper maintenance of said Licensed Area as a watershed area the Licensee hereby agrees to assist:

(a) The Licensor's Board of Agriculture and Forestry, in policing and protecting the Koolau Forest Reserve from estrays and damage from fire and in inspecting and reforesting this reserve.

(b) The Licensor's Board of Health, in preventing the pollution of so much of the Licensed Area as is located above the Koolau-Wailoa Ditch (the ditch furtherest mauka in said area).

(c) The Licensor's Division of Hydrography and the Federal Weather Bureau in obtaining rainfall, water yields, run-offs, and other similar data.

11. Use, where practicable, with the prior approval of the Licensor's Board of Agriculture and Forestry, forest timber situated on the Licensed Area for maintenance and construction work on said aqueduct system and all future extensions thereof.

RESERVING TO THE LICENSOR, however, the following:

12. The right of ingress, egress and regress for its agents and representatives on the Licensed Area at any time in the performance of their duties and for inspection of said aqueduct system.

13. The right to use all facilities now or hereafter installed or placed on the Licensed Area for measuring and recording flows of water, even if owned or operated by the Licensee, together with the right to install, operate and maintain, at its own cost and expense, such further and other

facilities as it may deem necessary for such purposes; pro-  
vided, that the Licensor in so doing shall not unreasonably  
interfere with the operation and maintenance of said aqueduct  
system and any extensions thereof.

14. The right to issue other and further licenses  
and leases pertaining to the Licensed Area and the development  
and diversion of further or additional water therein and to  
the use of existing roads and trails thereon, if jointly main-  
tained by the users of same, so long as the issuance of such  
other and further licenses and leases does not interfere un-  
reasonably with the then existing operations of the Licensee  
hereunder.

15. The right at any time during the term hereof to  
withdraw for domestic purposes (including the watering of live-  
stock) all or such portion of the government owned surface and  
ground water situate on the Licensed Area as may now or here-  
after be developed and diverted by the Licensee under the pro-  
visions hereof; provided, however, that no withdrawal of water  
in excess of a total amount of one million gallons per day,  
except in case of a water emergency as defined in paragraph  
33 and then only for the period thereof and subject to the  
provisions of paragraph 16, shall be effected without two years'  
advance written notice being given to the Licensee specifying  
the proposed quantity of water to be withdrawn.

16. The right, upon written notice of a water emer-  
gency, as defined in said paragraph 33, to withdraw, during  
the period of such emergency and solely for domestic purposes  
(including the watering of livestock), through the Kula water



conveyance system of the County of Maui, through the aqueduct system on the Licensed Area, through any system to which the Licensee may be entitled under the East Maui Water Agreement and under the licenses and agreements with the Licensor now or hereafter in effect, and through any private system owned or controlled by or under license to said Licensee and connecting therewith, all or such portion of government owned surface and ground water as may be necessary or desirable to meet said water emergency. No charge shall be made by the Licensee for the use of such system or systems except for payment of that portion of the fair cost of the operation and maintenance thereof as is properly allocable to the water so withdrawn, and for the period of such emergency, the liability of the Licensee for rental reserved shall be diminished pro tanto.

THE TERMS, RENTALS, COVENANTS, CONDITIONS AND AGREEMENTS under which this license is hereby given are as follows:

17. The term of this license is for twenty-one (21) years, commencing as of July 1, 1960, and ending on June 30, 1981, unless sooner terminated as hereinafter provided, during which term the Licensee shall pay to the Licensor at the office of the Commissioner of Public Lands, net over and above all taxes, and in addition to such payment or payments as may hereinafter be required, an annual fee of \_\_\_\_\_ per annum, one-half of which shall be payable semi-annually in advance on the first day of July and January of each license year.

18. In addition to the annual fee to be paid as above required, the Licensee shall pay to the Licensor in the manner

hereinafter set forth at the office of the Commissioner of Public Lands, net over and above all taxes, an annual rental which shall be equal to the product of the quantity of water actually or constructively diverted during each license year (a) from the Licensed Area or (b) to a point within such Licensed Area where the same is used by the Licensee for power or agricultural irrigation purposes or delivered for sale to others, times the price per million gallons of water set forth in the following schedule:

(1) When the average price per pound of raw sugar for the annual payment period is 6 cents or less, the price per million gallons of water diverted from the Licensed Area during said payment period shall be \$3.556.

(2) When the average price per pound of raw sugar for the annual payment period is greater than 6 cents and not more than 8.25 cents, the price per million gallons of water diverted from the Licensed Area during said payment period shall be \$3.556, increased at the rate of 2 cents for every 1/10th of a cent the said average price of raw sugar exceeds 6 cents per pound up to and including 8.25 cents per pound.

(3) When the average price per pound of raw sugar for the annual payment period is more than 8.25 cents, the price per million gallons of water diverted from the Licensed Area during said payment period shall be \$4.006.

Payment of such rental shall be made semi-annually in advance on the first day of July and January of each year in installments of \$25,000.00 each, the yearly aggregate of which sums shall be subject to adjustment (supplemental payment or credit against the next semi-annual payment of rental, as the case may be, the Licensor agreeing to refund any excess payment which may be due at the end of the term hereof) following the expiration of each license year to conform with the known quantity of water diverted and the average price of raw sugar for such year. Anything preceding to the contrary notwithstanding the Licensee shall at the end of the first ten (10) year period and again at the termination of this license, average the annual payments for said periods and should said average be less than FIFTY THOUSAND DOLLARS (\$50,000.00) per annum the Licensee shall pay the difference so as to guarantee to the Licensor a minimum payment of FIVE HUNDRED THOUSAND AND 00/100 DOLLARS (\$500,000.00) for the first ten (10) years and a minimum payment of FIVE HUNDRED FIFTY THOUSAND AND 00/100 DOLLARS (\$550,000.00) for the remaining eleven (11) year period, a total of ONE MILLION AND FIFTY THOUSAND AND 00/100 DOLLARS (\$1,050,000.00) for the term of this license.

19. Notwithstanding the foregoing provisions of paragraph 18 relating to rental:

(a) In the event that more than one-half of the water subject to this license shall be used by the Licensee or by others for purposes other than the continued irrigation of sugar cane and such new use or uses shall continue for a period in excess of two

years, the annual rental for such water as shall be placed to such new use or uses shall be subject to renegotiation between the Licensor and Licensee, and in the event the parties shall be unable to agree upon the new annual rental therefor, the same shall be determined by arbitration in the manner hereinafter provided.

(b) Whenever, from time to time, inflation shall have diminished the purchasing power of the dollar by 40%, as evidenced by increases in wholesale commodity prices over the arithmetical mean of wholesale commodity indices for the twelve (12) months of the annual payment period of rental in which the average price per pound of raw sugar is more than 8.25¢, the rental, upon written notice by the Licensor to the Licensee, shall be renegotiated by the parties to reflect the circumstances then existing, and if they are unable to agree, shall be subject to arbitration in the manner hereinafter provided.

(c) Whenever, from time to time, deflation shall have increased the purchasing power of the dollar as evidenced by decreases in wholesale commodity prices, returning the arithmetical mean of wholesale commodity price indices for the twelve (12) months of the annual payment period of rental to that which, under subparagraph (b) next above, would authorize a renegotiation of rental, any rental therefore renegotiated under said subparagraph (b) during

a period of inflation shall cease and determine and the original schedule of rental as reserved in paragraph 18 shall again apply as though said subparagraph (b) had never been written.

20. For purposes of assisting the Licensor in computing rental payments and the adjustments to be made thereto required under paragraphs 18 and 19 above, the Licensee shall, within three months after expiration of each license year (June 30th), except as provided in subparagraph (g) following, submit to the Licensor a statement prepared in duplicate for such license year showing in detail:

(a) The quantity of water diverted and conveyed from the Licensed Area by means of the jointly used aqueduct system, such quantity of water to be determined pursuant to the East Maui Water Agreement.

(b) The quantity of water diverted and conveyed by means of any other aqueduct system, whether the same be diverted and conveyed from the Licensed Area or to a point within such Licensed Area where the same is used by the Licensee for power or agricultural irrigation purposes or delivered for sale to others.

(c) The average price per pound of raw sugar for said license year.

(d) The computation whereby an adjustment of payment is determined so that the resulting rental paid by the Licensee shall conform with the rental required under paragraphs 18 and 19.

(e) The quantity of water used by the Licensee or by others for purposes other than the continued irrigation of sugar cane.

(f) The arithmetical mean of wholesale commodity price indices for the twelve (12) preceding months at any time the average price per pound of raw sugar is more than 8.25¢.

(g) The total quantity of water diverted and conveyed from the Licensed Area and to a point within such area for the first ten (10) year period and for the remaining eleven (11) year period, each such statement to be submitted within three months following the elapse of the applicable period.

Unless the Licensor and Licensee shall disagree with the factual information or computation so submitted, in which event such disagreement shall be determined by arbitration as hereinafter provided, and final adjustment of rental payments shall be made in accordance with such statement.

21. The Licensee, subject to the qualifications in subparagraphs (a) to (c) inclusive hereof shall, from March 1 to November 30, inclusive, of each license year, take all of the available water to which it has a right by this license up to that portion of the capacity of the aqueduct system to which the Licensor as the owner of the Licensed Area has a right under the East Maui Water Agreement; provided, however:

(a) If the sugar cane area irrigated by the Licensor's water is reduced by governmental restrictions the aforesaid requirement for the taking of

water may, at the option of the Licensee, be reduced proportionately.

(b) In the event the sugar cane area served by the water from this license cannot be irrigated because of a work stoppage of more than one (1) week's duration resulting from a labor dispute, the provisions of this license with respect to the permissive taking of water as set forth in paragraph 22 shall become effective, notwithstanding the fact such work stoppage may occur during months other than January, February and December, as of the first day of cessation of irrigation and shall remain in effect until the day the irrigation is again resumed or might reasonably have been resumed for such area.

(c) At such times as all reservoirs and other storage facilities of the Licensee now or hereafter constructed between Honopou and Maliko are filled to maximum safe capacity, the quantity of water diverted and conveyed under the terms of this license and subject to apportionment as provided in the East Maui Water Agreement shall be whichever is the greater of (1) the actual quantity taken through the water measuring devices of the Licensor on the Honopou boundary or (2) 370 million gallons per day or as close thereto as it is practical to set the various regulating gates; provided, however, that if storm or other unusual conditions occasion excessive water run-off which if diverted and conveyed would cause, in the

sole opinion of the Licensor's Division of Hydrography, dangerous overloading of the aqueduct system then and in such event and for the period of such storm or other unusual condition the quantity of water otherwise required to be diverted and conveyed under (1) or (2) above, whichever is the greater, shall be diminished by such quantity of water as may be deemed by said Division of Hydrography as being appropriate under the circumstances; and provided further, that whenever any section of the aqueduct system, between Honopou and Maliko Gulch, is shut off because of necessary repairs thereto, said figure of 370 million gallons shall be diminished by the reduced capacity of such section under repair.

22. The Licensee may, during January, February, and December of each license year, take from such Licensed Area only such water as it desires; provided, however, if the Licensee for purposes of replenishing the ground water resources of the Central Maui area (and not for the irrigation of sugar cane or other plant crops) shall desire to take further water therefrom and discharge the same into gulches, reservoirs and other places approved by the Territorial Hydrographer, the Licensee may do so without payment of rental therefor; provided further, however, that the right to take and discharge surplus water upon the Central Maui area shall be limited to that quantity of water as shall be in excess of the needs of the Licensor for public purposes; that if the Licensor shall, during the months of January, February, and



December, notify the Licensee in writing of a need for surplus water for public purposes the Licensee shall convey through the aqueduct system on the Licensed Area, through any system to which the Licensee may be entitled under the East Maui Water Agreement and under other licenses and agreements with the Licensor now or hereafter in effect, and through any private system owned or controlled by or under license to said Licensee and connecting therewith, such quantity of surplus water as may be required by the Licensor, without charge, except for payment of that portion of the fair cost of the operation and maintenance of such system or systems as is properly allocable to the water required and taken by the Licensor.

23. The Licensor and Licensee agree that the County of Maui shall have the right, if and when the consent of the Licensor shall first be granted said County, to divert and convey, subject to employment of proper water conservation practices at all times, by means of the Kula water conveyance system and without payment to the Licensee for the quantity of water so obtained all privately owned water to which said County may now or hereafter be entitled under agreement with the Licensee; provided, however, that in the event any such privately owned water shall be so diverted and conveyed the quantity of government owned water remaining subject to the terms of this license and upon which the Licensee hereunder shall be required to pay rent shall be diminished by an amount equal to that quantity so diverted and conveyed.

24. The Licensor and Licensee agree to furnish each other with all data obtained from any facilities for measuring and recording rainfall and the flows of water diverted from the Licensed Area and will allow each other the privilege of checking the same as well as inspecting the operation and maintenance of said water measuring stations.

25. The Licensee shall keep at all times in good order and repair the whole, or that portion as the case may be of any aqueduct system or systems as shall now or hereafter be operated by the Licensee within the Licensed Area; provided, however, that the cost of the operation and maintenance of any jointly used system or systems shall be borne by the Licensee in direct proportion to the use made thereof as provided in the East Maui Water Agreement, and the cost of any system or systems used exclusively by the Licensee, including all costs for the development of ground water by the Licensee, shall be borne exclusively by the Licensee.

26. The Licensee shall not, without the written consent of the Licensor first obtained, assign or transfer this license or any interest therein or thereunder.

27. The Licensor and Licensee agree that the terms, conditions and agreements contained in the East Maui Water Agreement, a copy of which is attached hereto and made a part hereof, including the special meanings given to the words and phrases appearing therein, shall apply to and be deemed a part of this license so far as applicable and not inconsistent with the provisions of this license.

28. That the Licensee shall, on or before the commencement date of this license, file with the Commissioner of Public Lands, and thereafter keep in full force and effect during the period of this license, a good and sufficient bond conditioned for the full and faithful observance and performance by said Licensee of all of the terms, covenants, and conditions of this license and in the sum of ONE HUNDRED THOUSAND AND 00/100 DOLLARS (\$100,000.00). Such bond shall be supported by the obligation of a corporate surety or not less than two personal sureties for which justifications shall be filed as provided in Section 7-21, Revised Laws of Hawaii 1955, provided, however, the Licensee may furnish a bond in like amount and conditioned as aforesaid executed by it alone, as obligor, if in lieu of any surety or sureties, it shall also furnish and at all times thereafter keep and maintain on deposit with the Commissioner security in certified checks, certificates of deposit (payable on demand or after such period as the Commissioner may stipulate), bonds, stocks or other negotiable securities or execute and deliver to said Commissioner a deed or deeds of trust of real property, all of such character as shall be satisfactory to said Commissioner and valued in the aggregate of not less than the principal amount of said bond. It is agreed that the value at which any securities may be accepted and at any time thereafter held by the Commissioner under the foregoing proviso shall be as determined by said Commissioner, and that the Licensee may, with the approval of the Commissioner, exchange other securities or money for any of the deposited securities if in the judgment of the Commissioner the substitute securities or money shall be at least

equal in value to the principal amount of the bond. It is further agreed that substitution of securities or the substitution of a deposit of security for the obligation of a surety or sureties may be made by the Licensee, but only upon the written consent of the Commissioner and that until such consent be granted, which shall be discretionary with the Commissioner, no surety shall be released or relieved of its obligation hereunder.

29. In case of the violation or failure to observe or perform any of the terms, conditions, covenants and agreements of this license by the Licensee at any time or times, the Licensor may, after ninety (90) days written notice to the Licensee and if the Licensee has not then remedied such failure or default, and without prejudice to any other right or remedy it may have under this or other agreement for breach of contract, cancel this license and thereupon, as well as upon the termination of this license by elapse of time or for any other cause, all improvements now or hereafter erected upon the Licensed Area, including the whole of such aqueduct system and all extensions thereof and improvements made thereto, but excluding such improvements as are provided for in the next succeeding paragraph, shall revert to and become the sole property of the Licensor; provided, however, that any such cancellation or termination of this license shall in no way affect the rights that the Licensee may have under the provisions of the East Maui Water Agreement and other existing licenses or agreements in full force and effect from or with the Licensor for the conveyance of water over and across said

Licensed Area unless said violation or failure shall also constitute a violation or failure to observe or perform the terms, conditions, covenants and agreements of said other licenses or agreements and a separate breach or breaches shall have been declared.

30. It is agreed that the Licensee may, on or before the termination of this license by elapse of time, or within ninety (90) days or such further reasonable time as the Licensor may allow following the cancellation or termination of this license for cause, remove any improvements, including power plants, power and telephone lines and all appurtenances thereto which have been or will have been constructed, erected and maintained by the Licensee upon or across the Licensed Area for purposes other than those necessary to operate any aqueduct system or systems, and any such improvements not removed within said time shall forthwith become the property of the Territory without necessity of any payment or further action.

31. If the Licensor and the Licensee shall be unable to agree upon the rent to be paid by the Licensee to the Licensor during any period for which such rent is to be renegotiated and fixed by mutual agreement as provided in paragraph 19 of the rental provisions, or in case any question, difference or disagreement shall arise at any time between the Licensor and the Licensee concerning any matter herein contained or in relation to the proper construction of any clause or provision herein contained, or the due observance or performance of any covenant of either party, the matter at issue

shall, at the desire of either party, be submitted to and determined by three (3) arbitrators in the manner provided for by Chapter 188, Revised Laws of Hawaii 1955, as the same may be amended from time to time, in which case either party may give to the other written notice of a desire to have an arbitration of the matter in dispute and name one of the arbitrators in said written notice, whereupon the other party shall, within ten (10) days after the receipt of such notice, name a second arbitrator, and in case of failure so to do, the party who has already named an arbitrator may have the second arbitrator selected or appointed by the Chief Justice or any Associate Justice of the Supreme Court of the Territory or State of Hawaii, and the two (2) arbitrators so appointed, in either manner, shall select and appoint the third arbitrator, and in the event the first two (2) arbitrators shall fail to appoint a third arbitrator within ten (10) days after the naming of the second arbitrator, either party may apply to a member of the Supreme Court as aforesaid to designate and appoint the third arbitrator and the three (3) arbitrators so appointed shall thereupon proceed to determine the matter in dispute, difference or question, and the decision and award of any two (2) of them (including the disposition of the costs of arbitration) shall be final, conclusive and binding upon the Licensor and Licensee unless the same shall be vacated, modified or corrected as by said statutes provided. The arbitrators shall have all the powers and duties prescribed by said statutes and judgment may be entered upon such award by the Circuit

Court of the Second Judicial Circuit as provided by said statutes and said judgment shall not be subject to appeal. In the event the question, difference or disagreement between the Licensor and Licensee shall involve the determination of rent, each arbitrator appointed as aforesaid shall have not less than ten (10) years effective experience in Hawaii next preceding his appointment in the field of real estate appraising of all classes of property, and the third arbitrator, selected and appointed by such arbitrators or by a member of the Supreme Court as aforesaid, shall in every event be either a member of the American Institute of Real Estate Appraisers or of the Institute of Real Estate Management or of the American Society of Real Estate Counselors or possess comparable qualifications.

32. "Wholesale commodity price indices" as used herein means the wholesale commodity price indices for all commodities as computed and published by the United States Department of Labor, Bureau of Labor Statistics, or other federal agency or successor thereto, and, in case the United States Bureau of Labor Statistics or such other agency shall cease to publish indices of wholesale commodity prices representative of all commodity prices or shall change the base or method thereof, then and thereafter the wholesale commodity prices for any calendar year shall be determined and comparisons thereof shall be made with reference to such other index or indices of commodity prices or of the purchasing power of the dollar or other similar index or indices in such manner as may be mutually agreed upon between the parties and if they are unable to agree then the matter shall be referred to arbitra-

tion as hereinabove provided.

33. "Water emergency" as used herein means a situation where, by reason of drought or other unusual and temporary condition, the County of Maui is (a) unable to furnish adequate water from its own sources for domestic purposes (including the watering of livestock) to its residents who could be served by the water covered by this license, and (b) able to accept delivery of said water, render such water potable, and deliver it for domestic purposes (including the watering of livestock) in the area where such emergency exists.

34. "Average price per pound of raw sugar" as used herein means the average price per pound of raw sugar as defined in the East Maui Water Agreement.

35. The terms, conditions and agreements hereof shall be binding upon and run in favor of the Licensor, its legal successors and assigns, and the Licensee, its successors and permitted assigns, or transferees, respectively, as the case may be; words in the singular or plural number signify both the plural and singular number; and each of the terms "or" and "and" has the meaning of the other or of both where the subject matter, sense and connection require such construction.

36. The acceptance of rent shall not waive any breach by the Licensee of any of the covenants, terms, agreements or conditions herein contained and on the part of the Licensee to be observed or performed, nor the right of the Licensor to exercise any legal remedies for such breach.



37. IN WITNESS WHEREOF, the Licensor has caused its name to be hereunto subscribed by its Commissioner of Public Lands, under his official seal, by and with the approval of the Governor of the Territory of Hawaii, this \_\_\_\_\_ day of \_\_\_\_\_, 1959, as of July 1, 1960, and the Licensee has caused its corporate name to be hereunto subscribed by its proper officers thereunto duly authorized by its Board of Directors in acceptance of the conditions herein set forth, this \_\_\_\_\_ day of \_\_\_\_\_, 1959, also as of July 1, 1960.

TERRITORY OF HAWAII

By: \_\_\_\_\_  
Commissioner of Public Lands  
Licensor

By: \_\_\_\_\_  
Its

And By: \_\_\_\_\_  
Its  
Licensee

APPROVED:

\_\_\_\_\_  
Governor of the Territory  
of Hawaii

APPROVED AS TO FORM:

\_\_\_\_\_  
Attorney General

# EAST MAUI IRRIGATION COMPANY, LIMITED

A SUBSIDIARY OF ALEXANDER & BALDWIN, INC.

P. O. BOX II  
PAIA, MAUI, HAWAII 96779

October 24, 1985

Mr. Stanley F. Kapustka  
District Chief  
U.S. Geological Survey, WRD  
P. O. Box 50166  
Honolulu, Hawaii 96850

Dear Mr. Kapustka:

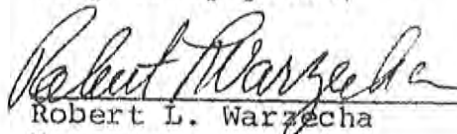
## WATER LICENSES - WASTE WATER 1984/85

During fiscal year 1984/85 waste water period, H.C. & S. Company did not waste water to recharge the Central Maui basal ground water.

Enclosed are the following tabulations to assist you in computing the water license yields:

1. Sale of water to County of Maui from E.M.I.'s Haiku Uka watershed.
2. Water pumped into the Koolau Ditch at Nahiku by Maui Pineapple Co., Ltd.

Very truly yours,



Robert L. Warzecha  
Manager

RLW:cg

Enclosures

Copy: State of HI DLNR  
A&B Inc  
HC&SCO  
USGS Maui

**EXHIBIT E-97**

EAST MAUI IRRIGATION COMPANY, LIMITED

SALE OF WATER to DEPARTMENT OF WATER SUPPLY, County of Maui

F.Y. 1984/85  
(in M.G.D.)

<u>1984</u>	<u>Olinda Reservoir Weir</u>	<u>*Olinda Lateral</u>	<u>TOTAL @ OLINDA</u>	<u>**PIIHOLO RESERVOIR</u>
July	17.565	-	17.565	-
August	6.223	.086	6.309	15.038
September	4.023	-	4.023	-
October	8.243	.083	8.326	121.021
November	4.087	-	4.087	-
December	23.596	.018	23.614	49.385
<u>1985</u>				
January	22.360	-	22.360	18.930
February	24.809	.014	24.823	41.616
March	21.754	-	21.754	14.244
April	33.465	.027	33.492	28.915
May	26.602	0	26.602	26.278
June	28.550	.012	28.562	109.518
			<u>221.517</u>	<u>424.945</u>

\*Olinda residents

\*\*No meter, adjusted with water sales to consumers.

WATER PUMPED INTO KOOLAU DITCH @ NAHIKU

BY MAUI PINEAPPLE CO., LTD.

F.Y. 1984/85  
(in M.G.D.)

Date	1984						1985					
	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	.604	.548	.269	.411	.587	.562	.446	0	.419	.145	0
2	.434	.604	.548	.281	.624	.587	.562	.446	0	0	0	0
3	0	.610	.548	.276	.624	.558	.605	.446	0	.281	0	.538
4	0	.610	0	.261	.286	.558	.580	.457	0	.603	0	.615
5	.617	.610	.465	.459	.520	.555	.580	.457	0	.604	0	.621
6	.609	.610	0	.271	.417	.555	.580	.451	0	.604	0	.621
7	.482	.610	.565	.324	.466	.574	.547	.451	0	.603	0	.617
8	0	.443	0	.323	.452	.287	.547	.441	0	.217	0	.617
9	.419	.443	0	.297	.477	0	.528	.441	0	0	0	.617
10	.628	.565	.414	.335	.477	0	.528	.441	0	.624	0	.625
11	.615	.565	.397	.454	.477	.559	.520	.441	0	.623	0	.625
12	.615	.565	.382	.541	.549	.413	.520	.441	0	.480	0	.625
13	.624	.614	0	.429	.476	.322	.520	.555	0	.619	0	.625
14	.624	.614	.387	0	.472	.607	0	.439	0	.620	0	.586
15	.624	.546	0	.355	.472	.607	.508	.456	0	.647	0	.586
16	.620	.592	0	.248	.421	.607	.487	.456	0	.081	0	.586
17	.620	0	.343	.418	.421	.619	.487	.456	0	0	.610	.609
18	.616	0	.320	0	.421	.232	.495	.456	0	0	.153	.609
19	.616	0	.311	.450	.185	0	.495	.453	0	0	0	.609
20	.618	.494	.313	0	0	.620	.495	.448	.596	0	0	.609
21	.618	0	.308	0	.401	.566	.495	.448	.139	0	0	.591
22	.618	.266	.320	.618	.401	.566	.502	.545	0	.603	0	.591
23	.614	0	.292	.309	.401	.566	.533	.545	0	0	0	.591
24	.614	.509	.318	.614	.401	.301	.422	.545	0	0	0	.611
25	.590	.509	.317	.256	.401	0	.467	.227	0	.357	0	.612
26	.590	0	.283	.623	.429	0	.466	0	0	.621	0	.611
27	.583	.433	.327	.623	0	.623	.467	0	0	.621	0	0
28	.583	.433	.381	0	.629	.253	.466	0	0	.621	0	.285
29	.583	.604	.295	.419	.629	0	.466	==	.635	.646	0	0
30	.554	0	.274	.409	.587	.332	.492	==	.635	.646	0	0
31	.554	.548	==	.493	==	.562	.492	==	.635	==	0	==
<hr/>												
TOTAL	15.882		8.656		12.927		15.414		2.640		.908	
		13.001		10.355		12.616		11.388		11.140		14.832
<hr/>												

GRAND TOTAL ..... 129.759



United States Department of the Interior

GEOLOGICAL SURVEY  
Water Resources Division  
P.O. Box 50166  
Honolulu, Hawaii 96850

November 6, 1985

Mr. Manabu Tagomori  
Manager-Chief Engineer  
Division of Water and Land Development  
Department of Land and Natural Resources  
P.O. Box 373  
Honolulu, Hawaii 96809

Dear Manabu:

The enclosed table shows the yield for the various East Maui licenses and the amount of water wasted to recharge the Central Maui basal ground-water body during the fiscal year June 30, 1985.

Sincerely,

Stanley F. Kapustka  
District Chief

Enclosure

cc: Mr. Richard Cox, Alexander & Baldwin, Inc.  
~~Mr. Robert W. Warrick, P.M.C. Co., Ltd.~~  
Mr. George Gohara, USGS, Maui

4.15  
G.H.  
Plu

EAST MAUI WATER LICENSE YIELD

FISCAL YEAR 1984-85

MEASUREMENT POINT	LEASE	YEAR MG	TOTAL MG	YIELD MG	* WATER WASTED MG	NET AFTER WASTING			
						TOTAL MG	Gov't %	Private MG	Gov't MG
<u>Makapipi Tunnel</u>			4,848	5,881	0	5,881	95.02	293	5,588
<u>Koolau ditch at Nahiku</u>	Nahiku	6,859	6,859	11,712	0	11,712	79.19	2,437	9,275
<u>Koolau ditch nr Keanae</u>	Keanae	18,571	18,571	9,024	0	9,024	47.39	4,748	4,276
<u>Haipueena boundary</u>	Honoumou								
<u>Kula diversion flume</u>		173	27,595						
<u>Spreckels ditch</u>		5,473							
<u>Koolau ditch</u>		20,060							
<u>Hannul Lu's ditch</u>		1,889							
<u>Honopou boundary</u>	Huelo			19,015	0	19,015	64.49	6,752	12,263
<u>Olinda water sold by E.M.I. to Maui County</u>		222	46,610						
<u>Lower Kula pipeline</u>		425							
<u>Piholo Reservoir</u>		31,461							
<u>Maioa ditch</u>		7,389							
<u>New Hamakua ditch</u>		4,420							
<u>Lowrie ditch</u>		2,693							
<u>Haiku ditch</u>									

12.6% of Koolau ditch at Nahiku less water pumped into ditch ( 6,859-130 = 6,729 mg)  
 Adjusted for water pumped into ditch (Haui Land & Pineapple Co. pumped 130 mg)  
 Water wasted to recharge Haui basal body.

DIVISION OF WATER  
 AGREED AT TO GOVT TO PRIVATE  
 WITH MANABU TAGAMORI 12/2/87  
 Meredith, Tom Trake & RWD

COMPARISON OF PRIVATE AND STATE WATER OWNERSHIP  
 AS CALCULATED BY THE METHODS DESCRIBED

	Private	State
(1) 1949 Isohyeta Study	26.782%	73.218%
(2) 1985 D.L.N.R. Study	25.650%	74.350%
(3) 1985 EMI Study	26.258%	73.742%
(4) 1985 EMI Re-study	<u>26.316%</u>	<u>73.684%</u>
(5) Actual Yield - 1949 Data	30.540%	69.460%
(6) Actual Yield - 1985 Data	30.200%	69.800%
(7) 1985 DLN RE-STUDY	27.29%	72.71%

Notes: AGREEMENT w/Manabu c. 12/2/87 30.00 70.00

- (1) 1949 isohyetal calculations by license area and combined.
- (2) 1985 isohyetal calculations for one license by D.L.N.R.
- (3) 1985 isohyetal calculations for one license by EMI Co.
- (4) 1985 isohyetal calculations by four individual licenses and combined, by EMI Co.
- (5) Actual water yield calculated by license using 1949 isohyetal study.
- (6) Actual water yield calculated by license using 1985 isohyetal study [(4) above].

(7) 1985 RE-STUDY AS PREPARED BY MERRITH, TOM TRAKE & RWD

**EXHIBIT E-98**

ACTUAL TOTAL WATER YIELD BY LICENSE

PERIOD 1970-85

	<u>Nahiku</u>	<u>Keanae</u>	<u>Honomanu</u>	<u>Huelo</u>	<u>Total</u>
1970-71	8,502	18,996	11,607	22,681	61,786
1971-72	5,228	11,086	6,703	17,479	40,496
1972-73	7,094	16,201	10,484	25,985	59,764
1973-74	5,698	12,625	6,817	14,272	39,412
1974-75	6,532	14,569	7,882	20,264	49,247
1975-76	6,923	15,819	8,597	23,515	54,854
1976-77	5,805	13,705	8,537	21,213	49,260
1977-78	5,684	14,010	7,774	22,238	49,706
1978-79	8,232	17,949	12,552	25,668	64,401
1979-80	8,495	16,950	13,654	15,748	54,847
1980-81	5,233	12,521	6,850	20,192	44,796
1981-82	7,697	16,427	13,366	17,370	54,860
1982-83	7,515	16,064	10,990	27,027	61,596
1983-84	7,597	16,069	10,379	27,588	61,633
1984-85	5,881	11,712	9,024	19,015	45,632
				TOTAL	792,290



ACTUAL YIELD STATE WATER BY LICENSE  
 USING 1949 ISOHYETAL STUDY

PERIOD 1970-75

	<u>Nahiku</u> 95.02%	<u>Keanae</u> 79.19%	<u>Honomanu</u> 47.39%	<u>Huelo</u> 64.49%	<u>Total</u>	<u>% Govt.</u>	
1970-71	8,079	15,043	5,501	14,627	43,250	70.00	
1971-72	4,968	8,779	3,177	11,272	28,196	69.63	
1972-73	6,741	12,830	4,968	16,758	41,297	69.10	
1973-74	5,414	9,998	3,231	9,204	27,847	70.66	
1974-75	6,207	11,537	3,735	13,068	34,547	70.15	
1975-76	6,578	12,527	4,074	15,165	38,344	69.90	
1976-77	5,516	10,853	4,046	13,680	34,095	69.21	
1977-78	5,401	11,095	3,684	14,341	34,521	69.45	
1978-79	7,822	14,214	5,948	16,553	44,537	69.16	
1979-80	8,072	13,423	6,471	10,156	38,122	69.51	
1980-81	4,972	9,915	3,246	13,022	31,155	69.55	
1981-82	7,314	13,009	6,334	11,202	37,859	69.01	
1982-83	7,141	12,721	5,208	17,430	42,500	69.00	
1983-84	7,219	12,725	4,919	17,792	42,655	69.21	
1984-85	5,588	9,275	4,276	12,263	31,402	68.82	
					TOTAL	550,327	69.46

ACTUAL YIELD STATE WATER BY LICENSE  
 USING 1985 ISOHYETAL STUDY

PERIOD 1970-85.

	<u>Nahiku</u> <del>95.05%</del> 95.65%	<u>Keanae</u> <del>23.67%</del> 83.67%	<u>Honomanu</u> <u>49.35%</u>	<u>Huelo</u> <u>61.18%</u>	<u>Total</u>	<u>% Govt.</u>
1970-71	8,132	15,894	5,462	13,876	43,364	70.18
1971-72	5,001	9,276	3,308	10,694	28,279	69.83
1972-73	6,785	13,555	5,174	15,898	41,412	69.29
1973-74	5,450	10,563	3,364	8,732	28,109	71.32
1974-75	6,248	12,190	3,890	12,398	34,726	70.51
1975-76	6,622	13,236	4,243	14,386	38,487	70.16
1976-77	5,552	11,467	4,213	12,978	34,210	69.45
1977-78	5,437	11,722	3,836	13,605	34,600	69.61
1978-79	7,874	15,018	6,194	15,704	44,790	69.55
1979-80	8,125	14,182	6,738	9,635	38,680	70.52
1980-81	5,005	10,476	3,380	12,353	31,214	69.68
1981-82	7,362	13,744	6,596	10,627	38,329	69.87
1982-83	7,188	13,441	5,424	16,535	42,588	69.14
1983-84	7,267	13,445	5,122	16,878	42,712	69.30
1984-85	5,625	9,799	4,453	11,633	31,510	69.05
				<b>TOTAL</b>	<b>553,010</b>	<b>69.80</b>

COMPARISON OF PRIVATE AND STATE WATER OWNERSHIP  
AS CALCULATED BY THE METHODS DESCRIBED

	<u>Private</u>	<u>State</u>
(1) 1949 Isohyetal Study	26.782%	73.218%
(2) 1985 D.L.N.R. Study	25.650%	74.350%
(3) 1985 EMI Study	26.258%	73.742%
(4) 1985 EMI Re-study	26.316%	73.684%
(5) Actual Yield - 1949 Data	30.540%	69.460%
(6) Actual Yield - 1985 Data	30.200%	69.800%

Notes:

- (1) 1949 isohyetal calculations by license area and combined.
- (2) 1985 isohyetal calculations for one license by D.L.N.R.
- (3) 1985 isohyetal calculations for one license by EMI Co.
- (4) 1985 isohyetal calculations by four individual licenses and combined, by EMI Co.
- (5) Actual water yield calculated by license using 1949 isohyetal study.
- (6) Actual water yield calculated by license using 1985 isohyetal study [(4) above].

COMPARISON OF PRIVATE AND STATE WATER OWNERSHIP  
BASED ON 1949 AND 1985 ISOHYETAL STUDIES BY LICENSEE

	<u>PRIVATE OWNERSHIP</u>		<u>STATE OWNERSHIP</u>
		<u>NAHIKU LICENSE</u>	
1949	4.98%		95.02%
1985	4.35%		95.65%
		<u>KEANAE LICENSE</u>	
1949	20.81%		79.19%
1985	16.33%		83.67%
		<u>HONOMANU LICENSE</u>	
1949	52.61%		47.39%
1985	50.65%		49.35%
		<u>HUELO LICENSE</u>	
1949	35.51		64.49%
1985	38.82		61.18%
		<u>TOTAL</u>	
1949	26.78%		73.22%
1985	26.32%		73.68%





January 12, 2011

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of December 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Garret Hew', is written over the typed name.

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Dave Taylor – DWS w/encls.

**EXHIBIT** E-100





December 13, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of November 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

A handwritten signature in black ink that reads 'Garret Hew'. The signature is written in a cursive, flowing style.

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.







November 10, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of October 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.





October 20, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of September 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.





September 21, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of August 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.





August 12, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of July 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.







July 7, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of June 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Garret Hew', is positioned above the printed name.

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.





June 3, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of May 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

A handwritten signature in cursive script that reads 'Garret Hew'.

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.





May 11, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of April 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Garret Hew', is positioned above the printed name.

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.



**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
**Department of Land and Natural Resources**  
**MONTHLY SURFACE WATER USE REPORT**

**For Official Use Only:**

Name: Mr. Garret Hew  
 Company: Hawaiian Commercial & Sugar Company  
 Address: P.O. Box 266  
Puunene, HI 96784  
 Telephone No.: (808) 877-6950 Fax No.: (808) 871-9723  
 Report Month: April Year: 2010

Report PID:  
 SWUR ID:

INSTRUCTIONS: Please TYPE OR PRINT CLEARLY. Complete this form to report total monthly surface water use, and, if required, other information from each of your surface-water sources. Mail to: Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809. For assistance, please call (808) 587-0234.

Diversion Gage ID*	Diversion Name	Period Begin Date (mm/dd/yy)	Period End Date (mm/dd/yy)	Quantity Measured (million gallons)	Method of Measurement**
6-17	Waihee Ditch at Field 63 (Hopoi)	04/01/10	04/30/10	722.20	Continuous Recorder
6-18	Spreckels Ditch @ Wailuku	04/01/10	04/30/10	531.64	Continuous Recorder
6-33	Wailoa Ditch @ Honopou	04/01/10	04/30/10	4622.50	Continuous Recorder
6-34	New Hamakua Ditch @ Honopou	04/01/10	04/30/10	1213.83	Continuous Recorder
6-35	Lowrie Ditch @ Honopou	04/01/10	04/30/10	769.46	Continuous Recorder
6-36	Haiku Ditch @ Honopou	04/01/10	04/30/10	306.91	Continuous Recorder
6-37	Water pumped into Koolau Ditch @ Nahiku	---	---	---	Water Meter

\* The Gage ID should be obtained from the Commission on Water Resource Management.  
 \*\* Flow meter, electrical consumption, weir or flume, not metered (estimated).

Other comments or additional information (e.g., date and method of chloride measurement, how pumpage amounts are estimated, etc.):  
 Water pumped into the Koolau Ditch @ Nahiku is reported by Maui Land and Pineapple Company

Submitted by (print): Garret Hew  
 Signature: *Garret Hew*

Title: Manager, Water Resources  
 Date: May 11, 2010



April 8, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of March 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.







March 23, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of February 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.



**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
**Department of Land and Natural Resources**  
**MONTHLY SURFACE WATER USE REPORT**

**For Official Use Only:**

---

Report PID: \_\_\_\_\_

---

SWUR ID: \_\_\_\_\_

**Name:** Mr. Garret Hew

**Company:** Hawaiian Commercial & Sugar Company

**Address:** P.O. Box 266  
Puunene, HI 96784

**Telephone No.:** (808) 877-6950      **Fax No.:** (808) 871-9723

**Report Month:** February      **Year:** 2010

INSTRUCTIONS: Please TYPE OR PRINT CLEARLY. Complete this form to report total monthly surface water use, and, if required, other information from each of your surface-water sources. Mail to: Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809. For assistance, please call (808) 587-0234.

Diversion Gage ID*	Diversion Name	Period Begin Date (mm/dd/yy)	Period End Date (mm/dd/yy)	Quantity Measured (million gallons)	Method of Measurement**
6-17	Waihee Ditch at Field 63 (Hopol)	02/01/10	02/28/10	395.27	Continuous Recorder
6-18	Spreckels Ditch @ Wailuku	02/01/10	02/28/10	285.56	Continuous Recorder
6-33	Wailoa Ditch @ Honopou	02/01/10	02/28/10	1,298.10	Continuous Recorder
6-34	New Hamakua Ditch @ Honopou	02/01/10	02/28/10	99.36	Continuous Recorder
6-35	Lowrie Ditch @ Honopou	02/01/10	02/28/10	218.19	Continuous Recorder
6-36	Haiku Ditch @ Honopou	02/01/10	02/28/10	36.10	Continuous Recorder
6-37	Water pumped into Koolau Ditch @ Nahiku	Quarterly	---	---	Water Meter

\* The Gage ID should be obtained from the Commission on Water Resource Management.  
 \*\* Flow meter, electrical consumption, weir or flume, not metered (estimated).

Other comments or additional information (e.g., date and method of chloride measurement, how pumpage amounts are estimated, etc.):  
 Water pumped into the Koolau Ditch @ Nahiku is reported by Maui Land and Pineapple Company

**Submitted by (print):** Garret Hew

**Signature:** *Garret Hew*

**Title:** Manager, Water Resources

**Date:** March 23, 2010



February 25, 2010

Mr. Dean Uyeno  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Uyeno,

Enclosed for your files is the Monthly Surface Water Use Report for the month of January 2010 for all gaging stations listed.

Please feel free to contact me at (808) 877-6950 should you have any questions.

Sincerely,

Garret Hew  
Manager, Water Resources

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.



**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
**Department of Land and Natural Resources**  
**MONTHLY SURFACE WATER USE REPORT**

**For Official Use Only:**

**Name:** Mr. Garret Hew  
**Company:** Hawaiian Commercial & Sugar Company  
**Address:** P.O. Box 266  
Puunene, HI 96784  
**Telephone No.:** (808) 877-6950 **Fax No.:** (808) 871-9723  
**Report Month:** January **Year:** 2010

**Report PID:**  
**SWUR ID:**

INSTRUCTIONS: Please TYPE OR PRINT CLEARLY. Complete this form to report total monthly surface water use, and, if required, other information from each of your surface-water sources. Mail to: Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809. For assistance, please call (808) 587-0234.

Diversion Gage ID*	Diversion Name	Period Begin Date (mm/dd/yy)	Period End Date (mm/dd/yy)	Quantity Measured (million gallons)	Method of Measurement**
6-17	Waihee Ditch at Field 63 (Hopoi)	01/01/10	01/31/10	234.98	Continuous Recorder
6-18	Spreckels Ditch @ Wailuku	01/01/10	01/31/10	341.33	Continuous Recorder
6-33	Wailoa Ditch @ Honopou	01/01/10	01/31/10	1867.44	Continuous Recorder
6-34	New Hamakua Ditch @ Honopou	01/01/10	01/31/10	231.46	Continuous Recorder
6-35	Lowrie Ditch @ Honopou	01/01/10	01/31/10	328.11	Continuous Recorder
6-36	Haiku Ditch @ Honopou	01/01/10	01/31/10	81.38	Continuous Recorder
6-37	Water pumped into Koolau Ditch @ Nahiku	Quarterly	--	--	Water Meter

\* The Gage ID should be obtained from the Commission on Water Resource Management.  
 \*\* Flow meter, electrical consumption, weir or flume, not metered (estimated).

Other comments or additional information (e.g., date and method of chloride measurement, how pumpage amounts are estimated, etc.):  
 Water pumped into the Koolau Ditch @ Nahiku is reported by Maui Land and Pineapple Company

**Submitted by (print):** Garret Hew  
**Signature:**

**Title:** Manager, Water Resources  
**Date:** February 25, 2010



**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
**Department of Land and Natural Resources**  
**MONTHLY SURFACE WATER USE REPORT**

**For Official Use Only:**

**PID: 3943 / 833**

**Name:** Mr. Garret Hew  
**Company:** Hawaiian Commercial & Sugar Company  
**Address:** P.O. Box 266  
 Puunene, HI 96784

**Telephone No:** (808) 877-6950 **Report Month/Year:** January 2012

**INSTRUCTIONS:** Please TYPE or PRINT CLEARLY. Complete this form to report total monthly surface water use, and, if required, other information from each of your surface water sources.  
**For electronic submissions:** Complete and digitally sign (*checkbox*) this form, then send file via e-mail to: [dlnr.cwrp@hawaii.gov](mailto:dlnr.cwrp@hawaii.gov)  
**For hardcopy submissions:** Complete, print and sign this form, then send printed report via mail to: Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809. For fax submissions, send to (808) 587-0219.  
**For assistance:** Please contact the Stream Protection and Management Branch at (808) 587-0234.

Diversion Gage ID*	Diversion Name	Period Begin Date (mm/dd/yy)	Period End Date (mm/dd/yy)	Quantity Measured (gallons)	Method of Measurement**
6-17	Waihee Ditch @ Field 63 (Hopoi)	01/01/12	01/31/12	185.15 MG	continuous recorder
6-18	Spreckels Ditch @ Wailuku	01/01/12	01/31/12	288.73 MG	continuous recorder
6-33	Wailoa Ditch @ Honopou	01/01/12	01/31/12	1608.86 MG	continuous recorder
6-34	New Hamakua Ditch @ Honopou	01/01/12	01/31/12	113.54 MG	continuous recorder
6-35	Lowrie Ditch @ Honopou	01/01/12	01/31/12	278.21 MG	continuous recorder
6-36	Haiku Ditch @ Honopou	01/01/12	01/31/12	50.24 MG	continuous recorder
6-37	Water pumped into Koolau Ditch @ Nahiku	01/01/12	01/31/12	0 MG	flow meter
6-51	Koolau Ditch @ Nahiku	01/01/12	01/31/12	401.80 MG	continuous recorder
6-52	Koolau Ditch @ Keanae	01/01/12	01/31/12	848.19 MG	continuous recorder
6-53	Spreckels Ditch @ Halpuaena	01/01/12	01/31/12	83.14 MG	continuous recorder
6-54	Lowrie Ditch @ Kailua	01/01/12	01/31/12	173.36 MG	continuous recorder
6-55	Wailoa Ditch @ Opana	01/01/12	01/31/12	1700.78 MG	continuous recorder
6-56	Kauhikoa Ditch @ Maliko	01/01/12	01/31/12	306.61 MG	continuous recorder
6-57	Lowrie Ditch @ Maliko	01/01/12	01/31/12	351.10 MG	continuous recorder
6-58	Haiku Ditch @ Maliko	01/01/12	01/31/12	146.74 MG	continuous recorder

\* The Gage ID should be obtained from the Commission on Water Resource Management.

\*\* Flow meter, continuous, electrical consumption, pumpage, weir or flume, estimated.

Other comments or additional information (e.g., date and method of measurement, how amounts are estimated, etc.):

New Hamakua ditch figures taken from daily water report.

**Submitted by (print):** Garret Hew

**Title:** Manager, water resources

**For electronic submissions:**

By checking this box, I understand and affirm that the information provided herein is accurate and true to the best of my knowledge.

**Date:** 02/03/12

**For hardcopy submissions:**

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

By signing here, I understand and affirm that the information provided herein is accurate and true to the best of my knowledge.

**EXHIBIT E-101**



**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
**Department of Land and Natural Resources**  
**MONTHLY SURFACE WATER USE REPORT**

**For Official Use Only:**

PID: 3943 / 833

**Name:** Mr. Garret Hew  
**Company:** Hawaiian Commercial & Sugar Company  
**Address:** P.O. Box 266  
 Puunene, HI 96784  
**Telephone No:** (808) 877-6950 **Report Month/Year:** January 2014

**INSTRUCTIONS:** Please TYPE or PRINT CLEARLY. Complete this form to report total monthly surface water use, and, if required, other information from each of your surface water sources.  
**For electronic submissions:** Complete and digitally sign (checkbox) this form, then send file via e-mail to: [dlnr.cwrmm@hawaii.gov](mailto:dlnr.cwrmm@hawaii.gov)  
**For hardcopy submissions:** Complete, print and sign this form, then send printed report via mail to: Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809. For fax submissions, send to (808) 587-0219.  
**For assistance:** Please contact the Stream Protection and Management Branch at (808) 587-0234.

Diversion Gage ID*	Diversion Name	Period Begin Date (mm/dd/yy)	Period End Date (mm/dd/yy)	Quantity Measured (gallons)	Method of Measurement**
6-17	Waihee Ditch @ Field 63 (Hopoi)	01/01/14	01/31/14	203.14 MG	continuous recorder
6-18	Spreckels Ditch @ Walluku	01/01/14	01/31/14	374.03 MG	continuous recorder
6-33	Wailoa Ditch @ Honopou (WHP)	01/01/14	01/31/14	2209.77.37 MG	continuous recorder
6-34	New Hamakua Ditch @ Honopou (NHP)	01/01/14	01/31/14	293.62 MG	continuous recorder
6-35	Lowrie Ditch @ Honopou (LHP)	01/01/14	01/31/14	313.63 MG	continuous recorder
6-36	Haiku Ditch @ Honopou (HHP)	01/01/14	01/31/14	39.67 MG	continuous recorder
6-37	Water pumped into Koolau Ditch @ Nahiku	01/01/14	01/31/14	0 MG	flow meter
6-51	Koolau Ditch @ Nahiku (Waiaka)	01/01/14	01/31/14	316.06 MG	continuous recorder
6-52	Koolau Ditch @ Keanae (KKN)	01/01/14	01/31/14	NO DATA	continuous recorder
6-53	Spreckels Ditch @ Halpuaena (SHP)	01/01/14	01/31/14	138.30 MG	continuous recorder
6-54	Lowrie Ditch @ Kaliua (LKL)	01/01/14	01/31/14	228.38 MG	continuous recorder
6-55	Wailoa Ditch @ Opana	01/01/14	01/31/14	2241.11 MG	continuous recorder
6-56	Kauhiko Ditch @ Maliko	01/01/14	01/31/14	246.00 MG	continuous recorder
6-57	Lowrie Ditch @ Maliko	01/01/14	01/31/14	251.32 MG	continuous recorder
6-58	Halku Ditch @ Maliko	01/01/14	01/31/14	187.35 MG	continuous recorder

\* The Gage ID should be obtained from the Commission on Water Resource Management.  
 \*\* Flow meter, continuous, electrical consumption, pumpage, weir or flume, estimated.  
 Other comments or additional information (e.g., date and method of measurement, how amounts are estimated, etc.):

**Submitted by (print):** Garret Hew **Title:** Manager, Water Resources

**For electronic submissions:**  
 By checking this box, I understand and affirm that the information provided herein is accurate and true to the best of my knowledge. **Date:** 2/18/2014

**For hardcopy submissions:**  
**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
 By signing here, I understand and affirm that the information provided herein is accurate and true to the best of my knowledge.



**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
**Department of Land and Natural Resources**  
**MONTHLY SURFACE WATER USE REPORT**

**For Official Use Only:**

PID: 3943 / 833

Name: Mr. Garret Hew  
 Company: Hawaiian Commercial & Sugar Company  
 Address: P.O. Box 266  
 Puunene, HI 96784

Telephone No: (808) 877-6950 Report Month/Year: January 2011

**INSTRUCTIONS:** Please TYPE or PRINT CLEARLY. Complete this form to report total monthly surface water use, and, if required, other information from each of your surface water sources.  
**For electronic submissions:** Complete and digitally sign (*checkbox*) this form, then send file via e-mail to: dnr.cwrmm@hawaii.gov  
**For hardcopy submissions:** Complete, print and sign this form, then send printed report via mail to: Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809. For fax submissions, send to (808) 587-0219.  
**For assistance:** Please contact the Stream Protection and Management Branch at (808) 587-0234.

Diversion Gage ID*	Diversion Name	Period Begin Date (mm/dd/yy)	Period End Date (mm/dd/yy)	Quantity Measured (gallons)	Method of Measurement**
6-17	Waihee Ditch @ Field 63 (Hopoi)	01/01/11	01/31/11	374.74 MG	continuous recorder
6-18	Spreckels Ditch @ Wailuku	01/01/11	01/31/11	285.20 MG	continuous recorder
6-33	Wailoa Ditch @ Honopou	01/01/11	01/31/11	1275.46 MG	continuous recorder
6-34	New Hamakua Ditch @ Honopou	01/01/11	01/31/11	232.03 MG	continuous recorder
6-35	Lowrie Ditch @ Honopou	01/01/11	01/31/11	328.09 MG	continuous recorder
6-36	Haiku Ditch @ Honopou	01/01/11	01/31/11	51.15 MG	continuous recorder
6-37	Water pumped into Koolau Ditch @ Nahiku	01/01/11	01/31/11	0	flow meter
6-51	Koolau Ditch @ Nahiku	01/01/11	01/31/11	328.23 MG	continuous recorder
6-52	Koolau Ditch @ Keanae	01/01/11	01/31/11	796.01 MG	continuous recorder
6-53	Spreckels Ditch @ Haipuaena	01/01/11	01/31/11	81.26 MG	continuous recorder
6-54	Lowrie Ditch @ Kailua	01/01/11	01/31/11	180.42 MG	continuous recorder
6-55	Wailoa Ditch @ Opana	01/01/11	01/31/11	1711.09 MG	continuous recorder
6-56	Kauhikoa Ditch @ Maliko	01/01/11	01/31/11	157.05 MG	continuous recorder
6-57	Lowrie Ditch @ Maliko	01/01/11	01/31/11	238.56 MG	continuous recorder
6-58	Haiku Ditch @ Maliko	01/01/11	01/31/11	271.22 MG	continuous recorder

\* The Gage ID should be obtained from the Commission on Water Resource Management.  
 \*\* Flow meter, continuous, electrical consumption, pumpage, weir or flume, estimated.  
 Other comments or additional information (e.g., date and method of measurement, how amounts are estimated, etc.):  
 Wailoa @ Honopou: Quantity measured was estimated on the days the logger malfunctioned.

Submitted by (print): Garret Hew Title: Manager, water resources

For electronic submissions:  
 By checking this box, I understand and affirm that the information provided herein is accurate and true to the best of my knowledge. Date: 3/14/11

For hardcopy submissions:  
 Signature: Date:

By signing here, I understand and affirm that the information provided herein is accurate and true to the best of my knowledge.





**MEMORANDUM OF UNDERSTANDING CONCERNING  
SETTLEMENT OF WATER AND RELATED ISSUES**

Pursuant to this Memorandum of Understanding, the Board of Water Supply, County of Maui ("BWS") and Alexander & Baldwin, Inc. ("A&B") hereby agree to cooperate on certain matters being discussed by the parties relating to the following subjects:

1. Wailoa Ditch
2. Iao-Waikapu Ditch
3. H'poko Wells
4. Power
5. Central Maui Source Joint Venture ("JV")
6. East Maui Water Development Plan

The implementation of this Memorandum will be pursuant to one or more agreements to be negotiated and agreed upon as a package. The parties agree as follows:

1. Wailoa Ditch

The 1973 Memorandum of Understanding ("MOU") will be amended (the "Amendment") to accomplish the following:

- ✓(a) Increase the BWS's allotment to 12 mgd with option for additional 4 mgd (per original agreement).
- ✓(b) During periods of low flow, BWS to have minimum allotment of 8.2 mgd.
- ✓(c) During periods of low flow, HC&S will have a minimum flow of 8.2 mgd (9.4 mgd should fire flow be required).
- ✓(d) When the ditch flow drops below the combined minimum needs of BWS and HC&S (i.e., 16.4 mgd, or 17.6 mgd with fire flow), then BWS and HC&S each shall be entitled to receive: (a) its respective direct contribution to the ditch flow (i.e., BWS would be entitled to the portion of ditch flow attributable to ground water it pumps into the ditch, and HC&S would be entitled to the portion of the ditch flow attributable to its East Maui lands (30%); and (b) 50% of the amount of ditch flow remaining after deducting the parties' direct contributions from the total.
- ✓(e) During periods of low flow, HC&S will not divert water to lower elevation ditch systems.

**EXHIBIT** E-105

- ✓(f) When the three-day average flow in the ditch falls below 55 mgd, BWS shall fully utilize all available ground water sources to supplement the Upcountry system and encourage conservation practices by domestic water users.
- ✓(g) Extend the term of the MOU for 25 years.
- (h) The fee charged to BWS will remain unchanged (six cents per thousand gallons).
- ✓(I) BWS to initiate and implement a long-term plan for permanent improvements to the Waikamoi flume system.
- ✓(j) A&B to cooperate in the development of a dual system to serve Upcountry diversified agriculture.
- ✓(k) BWS will develop and implement a stream flow monitoring program to provide current baseline data.
- ✓(l) As long-term agricultural water needs are reduced, a stream restoration program will be studied, developed, and initiated by BWS.
- (m) In return for increasing the allocation of ditch water to BWS, A&B may receive an appropriate allocation of domestic water (subject to normal system-wide limitations and conformity with general and community plans), to be mutually agreed upon in the Amendment.
- ✓(n) BWS shall utilize its best efforts to maintain storage levels at 80% of maximum capacity of both Piiholo and Kahakapao reservoirs.
- ✓(o) BWS shall pursue the implementation of additional raw water storage in the Lower Kula system.
- ✓(p) BWS shall cooperate with A&B regarding appropriate permits or leases (short and long-term) for East Maui waters from the State of Hawaii.
- ✓(q) BWS to pursue ground water development for Upcountry Maui to mitigate drought effects. For example, BWS shall pursue exploratory wells (i.e., Lower Kula and Pulehu) to supplement the domestic water sources for Upcountry. A&B may participate in such well development in exchange for an appropriate water allocation (subject to normal system-wide limitations and conformity with general and community plans).
- ✓(r) BWS to pursue, with HC&S's cooperation, establishing supplemental water sources to maintain the viability of the Kula Ag Park.

2. Iao Waikapu Ditch

Subject to Wailuku Agribusiness's agreement, a new Agreement Concerning Temporary Withdrawal from the Iao Waikapu Ditch will be entered into and include the following terms:

- (a) BWS shall be entitled to withdraw up to 300,000 gallons per day from the Iao Waikapu Ditch, except when the flow in the Iao Stream falls below 11.5 mgd.
- (b) BWS shall pay a monthly charge of \$2,000 for this allocation.
- (c) BWS shall be entitled to take additional water (for a total withdrawal of up to 2 million gallons per day) whenever the flow in Iao Stream exceeds 55 mgd. For this additional water, BWS shall pay \$0.12 per thousand gallons (not including water used for back-washing filters).
- (d) The term of the agreement shall be two years and may be extended upon mutual agreement of the parties.

3. H'poko Wells

BWS and HC&S to pursue the following:

- (a) BWS to expedite completion of necessary engineering reports and will pursue approvals to utilize the wells for domestic purposes.
- (b) A&B will convey all necessary land and easements to BWS.
- (c) Subject to the completion and acceptance of the East Maui Development Plan EIS, A&B will consider participating in the construction of the transmission line from the well site to the BWS's Paia system in exchange for an appropriate allocation of water for its participation.
- (d) In consideration of providing such necessary land and easements, A&B may receive an appropriate allocation of domestic water (subject to normal system-wide limitations and conformity with general and community plans) to be mutually agreed to.

4. Power

BWS and HC&S intend to pursue the following:

- (a) HC&S will provide appropriate information on its transmission and distribution system to BWS or its consultants.
- (b) HC&S shall provide available power to BWS at mutually agreed upon locations, at a price not to exceed that paid by Maui Electric. BWS understands that the power being provided is not "firm", and that it shall be responsible for any necessary stand-by generators.
- (c) BWS shall, with HC&S's cooperation, explore the long-term feasibility of developing hydroelectric and other alternative energy sources.

5. Central Maui Source Joint Venture

- (a) BWS acknowledges that there is an unmet obligation to the Central Maui Source Joint Venture arising out of the JV's prior development of three wells having an installed pumping capacity of 13.4 mgd.
- (b) Subject to the approval of the other parties to the JV, BWS and the JV shall enter into a mutually acceptable settlement agreement resolving all outstanding issues regarding the Central Maui Source Joint Venture.
- (c) Any entitlement arising out of this resolution shall be for properties the JV members own or subsequently acquire for development within the area served by the Central Maui system; rights may be transferred to a subsequent purchaser or developer, but may not otherwise be transferred.
- (d) Within 30 days of the Memorandum, the Chairman of BWS (and/or his designees) shall enter into negotiations with representatives of the JV on a settlement agreement to establish:
  - (1) Existing usage by members of the JV;
  - (2) Future usage standards to be applied;
  - (3) The remaining entitlement of the JV;
  - (4) The terms and conditions of providing and utilizing the entitlement.

6. East Maui Water Development Plan

BWS and HC&S intend to pursue the following:

- (a) BWS to proceed expeditiously with the supplemental EIS for the project as originally planned.
- (b) BWS will assure that stream flow monitoring is an integral part of the scope of work.
- (c) A&B may participate in the project in exchange for an appropriate water allocation (subject to normal system-wide limitations and conformity with general and community plans).

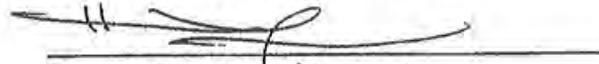
IN WITNESS WHEREOF, the parties hereto have caused their duly authorized representatives to execute this Memorandum of Understanding as of this 13<sup>th</sup> day of ~~March~~ <sup>April</sup>, 2000.

ALEXANDER & BALDWIN, INC.

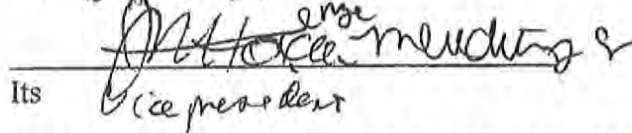
APPROVED AS TO FORM AND LEGALITY:



Its ~~Vice President~~

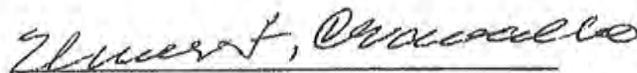


Deputy Corporation Counsel

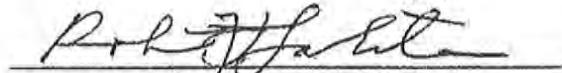
  
Its ~~Vice President~~

Date: April 13, 2000

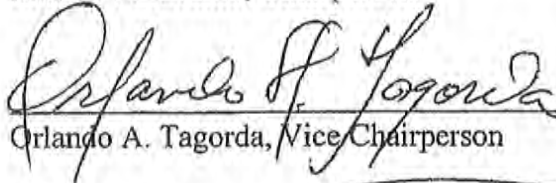
MAUI COUNTY BOARD OF WATER SUPPLY



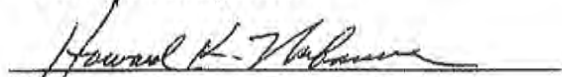
Elmer F. Cravalho, Chairperson



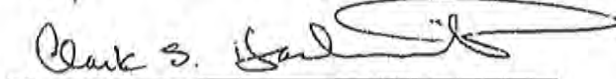
Robert K. Takitani, Board Member and Past Chairperson



Orlando A. Tagorda, Vice Chairperson



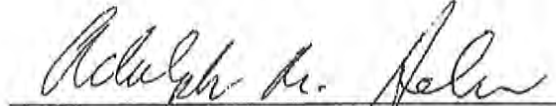
Howard Nakamura, Board Member



Clark S. Hashimoto, Board Member



Peter Rice, Board Member



Adolph M. Helm, Board Member



Jonathan A. Starr, Board Member



Michael A. Nobriga, Board Member



**Monsanto Maui  
Location #3  
Mokulele Highway**

**Monsanto  
230 acres**

Waikapu

Central Maui  
Baseyard

Maui  
Humane  
Society

Mokulele  
Hwy

Kealia Pond

Maalaea



**Monsanto Maui**  
**Location #2**  
North Kihei, Maui

**Monsanto**  
290 acres

**Kealia Pond**



LICENSE AND WATER TRANSMISSION AGREEMENT

BY AND AMONG

EAST MAUI IRRIGATION COMPANY, LIMITED,  
a Hawaii Corporation

A&B-HAWAII, INC.,  
a Hawaii Corporation, through its Division  
HAWAIIAN COMMERCIAL & SUGAR COMPANY

and

MAUI PINEAPPLE COMPANY, LTD.,  
a Hawaii Corporation

**EXHIBIT** E-107

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LICENSE AND WATER TRANSMISSION AGREEMENT

THIS LICENSE AND WATER TRANSMISSION AGREEMENT made this 22nd day of May, 1991, effective January 1, 1990, is by and between MAUI PINEAPPLE COMPANY, LTD. ("Maui Pine"), a Hawaii corporation, and EAST MAUI IRRIGATION COMPANY, LIMITED ("EMI"), a Hawaii corporation, and A&B-HAWAII, INC., a Hawaii corporation, through its division HAWAIIAN COMMERCIAL & SUGAR COMPANY ("HC&S").

This Agreement is based on the following recitals:

A. Maui Pine grows pineapple in Central Maui.

B. HC&S grows sugar cane on Maui.

C. EMI collects water in East Maui and moves such water to Central Maui by a system of ditches, tunnels, siphons, water transmission lines, and the like, that EMI owns and has developed and maintains. This water transportation system is collectively referred to as the "EMI Water Transmission System".

D. Maui Pine owns a parcel of land located in the Nahiku district, Island of Maui, Hawaii, identified as Tax Map Key No. (2) 1-2-04-6. Maui Pine owns a pump which is located on EMI property being a portion of Tax Map Key No. (2) 1-2-1-01 (the "Nahiku Pump"). The EMI property upon which the Nahiku Pump is located and the land which Maui Pine uses to operate the Nahiku Pump is collectively referred to as the "Nahiku Pump Site" and is shown on Exhibit "A", which is attached to and is made a part of this Agreement. Maui Pine operates the Nahiku Pump at the Nahiku Pump Site, from which Maui Pine draws water for use in Central Maui. The water drawn from the Nahiku Pump is transported by a pipeline which runs across EMI property being Tax Map Key No. 1-2-4-10 consisting of approximately 27 acres. This property is referred to as the Nahiku Pipeline and is designated in Exhibit "A". Maui Pine desires to license EMI's portion of the Nahiku Pump Site and the Nahiku Pipeline and to use the EMI Water Transmission System to move water from the Nahiku Pump to Central Maui for use in its cultivation of pineapple.

(c) Termination. Upon the termination of this Agreement, the Power Line Easement shall be terminated, and Maui Pine shall surrender the Power Line Easement in the same or better state and condition as of the execution of this agreement. Upon the termination of this Agreement, EMI shall have the option to require Maui Pine either (i) to remove all such equipment which has been installed, or (ii) to surrender said equipment, leaving it in place, in which event all such equipment, including but not limited to the power line and the improvements erected to install and secure the power line, shall become the property of EMI, provided that EMI shall pay Maui Pine the fair market value of the equipment at the time of termination.

(d) Maintenance. EMI, at its sole expense, shall maintain Makapipi Road and the roads, gates and trails which are located within or run along the Power Line Easement or are used by Maui Pine in connection with use of the Power Line Easement during the term of the Agreement in conditions similar to those which existed as of the effective date of this Agreement.

4. Maui Pine Use of EMI Water Transmission System.

4.1. Wailoa and New Hamakua Ditches.

4.1.2. Use, Delivery and Withdrawal Points.

EMI hereby grants to Maui Pine a nonexclusive license to use (a) the Wailoa Ditch and (b) the New Hamakua Ditch in order to transport to Central Maui the water pumped from the Nahiku Pump and the Kuhiwa Well pursuant to this Agreement. The delivery points where water will be pumped from the Nahiku Pump and the Kuhiwa Well into the Wailoa Ditch and the New Hamakua Ditch are designated on the map attached to and made a part of this agreement as Exhibit "C" (the "Delivery Points"). Maui Pine shall withdraw the transported water to which it is entitled in Central Maui at the withdrawal points which are designated on the map attached to and made a part of this Agreement as Exhibit "D" (the "Withdrawal Points"). All of such Withdrawal Points of the

Hamakua Ditch and the Kauhikoa Ditch are located west of Maliko Gulch.

4.1.3. Limitation on Maui Pine Withdrawals.

For each gallon of water that Maui Pine places into the Wailoa Ditch or the New Hamakua Ditch from the Nahiku Pump or the Kuhiwa Well, Maui Pine shall have the right to withdraw 0.9 gallon of water from the Withdrawal Points on the same day that Maui Pine deposits water into the particular ditch.

4.2. Lowrie Ditch. EMI hereby grants Maui Pine a restrictive nonexclusive license to use the Lowrie Ditch as set forth hereinbelow. Maui Pine shall not put any water pumped from the Nahiku Pump or the Kuhiwa Well into the Lowrie Ditch. If on any particular day the Lowrie Ditch is "full", Maui Pine may withdraw from the Lowrie Ditch 0.9 gallon of water for each gallon of water that Maui Pine places into either the Wailoa Ditch or the New Hamakua Ditch that same day, provided that Maui Pine has not withdrawn its full entitlement of water as set forth in Section 4.1 above on that same day. However, Maui Pine's right to withdraw water from the Lowrie Ditch, shall, in any event, be limited to 270,000 gallons a day. If the Lowrie Ditch is "low", then Maui Pine shall not have the right to withdraw any water from the Lowrie Ditch. The withdrawal points from which Maui Pine may withdraw water from the Lowrie Ditch are designated on the map attached to and made a part of this Agreement as Exhibit "E" (the "Lowrie Ditch Withdrawal Points") and are located east of Maliko Gulch. The terms "full" and "low" used in this section to describe various conditions of water volume in the Lowrie Ditch shall be determined by HC&S in its sole discretion.

4.3. Water Meters. Maui Pine shall install and maintain suitable water meters or other measuring devices (collectively "water meters") reasonably satisfactory to EMI, in its sole discretion, for the purposes of measuring the total amount of water put into the Wailoa Ditch and the New Hamakua Ditch by Maui Pine. Maui Pine shall also install and maintain, to EMI's satisfaction, water meters that shall record the amount of water

that Maui Pine withdraws from the Hamakua Ditch, the Kauhikoa Ditch and the Lowrie Ditch. The water meters shall be maintained within 2% accuracy and shall be tested on a reasonable periodic basis or as may be requested by EMI. Maui Pine shall provide EMI with the results of such tests. Subject to the provisions of this Agreement, Maui Pine shall control (including the power to stop) the delivery and withdrawal of water at the Delivery Points, the Withdrawal Points and the Lowrie Withdrawal Points.

4.4. Maintenance of EMI Water Transmission System.

EMI shall keep and maintain the Wailoa Ditch, the New Hamakua Ditch and the Lowrie Ditch in good repair, and shall pay and be liable for all ordinary maintenance and repair costs. If as a result of any unanticipated event or events resulting from a single occurrence, either or both of the Wailoa Ditch (or the Hamakua Ditch or the Koolau Ditch) or the New Hamakua Ditch (or the Kauhikoa Ditch) should be damaged and the aggregate cost to repair such damage exceeds \$10,000 (the "Extraordinary Repair Costs"), Maui Pine shall contribute toward the Extraordinary Repair Costs. The amount of Maui Pine's share of Extraordinary Repair Costs will be determined as follows:

Amount of Water Withdrawn From Damaged Ditch By Maui Pine During The Prior Five Years (pursuant to this Agreement or any previous agreements or understand- <u>ings between the parties</u>	x	Extraordinary Repair Costs
Amount of Water Withdrawn From Damaged Ditch By Maui Pine And EMI/HC&S During The Prior Five Years (pursuant to this Agreement or any previous agreements between the parties or understandings		

4.5. Spray Water. "Spray Water" means water that Maui Pine intends to use to deliver fertilizer, fungicides, insecticides, or other agricultural material as needed, on its pineapple crop. Maui Pine needs to withdraw from the EMI Water



Transmission System relatively small amounts of Spray Water (as compared with the water that Maui Pine needs for irrigation) from time to time. Maui Pine does not want to pump at the Nahiku Pump or at the Kuhiwa Well just to be able to be entitled to withdraw water for use as Spray Water. EMI will accommodate Maui Pine by allowing it, from time to time, to put more water into the EMI Water Transmission System than Maui Pine withdraws at that time and establish for itself a "Spray Water Credit". The Maui Pine Spray Water Credit shall never exceed one million gallons at any time. The Spray Water Credit shall be established at the ratio of 0.9 gallon of water withdrawable for each gallon of water put into the EMI Water Transmission System. Maui Pine shall have the right to withdraw water from the EMI Water Transmission System, from time to time, for use as Spray Water, up to the amount of Maui Pine's Spray Water Credit existing at that time.

5. Maui Pine Payments. Maui Pine shall make the following payments to EMI under this Agreement.

5.1. Kuhiwa Well Site Fee. Maui Pine shall pay EMI a monthly fee for the Kuhiwa Well Site as follows:

<u>Year</u>	<u>Monthly Fee</u>
1990	\$ 150.00
1991	\$ 156.00
1992	\$ 162.24
1993	\$ 168.73
1994	\$ 175.48
1995	\$ 182.50
1996	\$ 189.80
1997	\$ 197.50
1998	\$ 205.40
1999	\$ 213.62
2000	\$ 241.92
2001	\$ 251.60
2002	\$ 261.66
2003	\$ 272.13
2004	\$ 283.02

<u>Year</u>	<u>Amount</u>
2005	\$ 294.34
2006	\$ 306.11
2007	\$ 318.35
2008	\$ 331.08
2009	\$ 344.32

Maui Pine shall make such payments quarterly within thirty (30) days of EMI's billing date.

5.2. Nahiku Pump Site and Nahiku Pipeline. Maui Pine shall pay EMI an annual fee of \$27 for the use of EMI's portion of the Nahiku Pump Site and the Nahiku Pipeline. Maui Pine shall make such payment in advance of the first business day of January of each year.

5.3. EMI Administration Costs. Maui Pine shall pay EMI the following sums each year to cover the EMI administrative expenses:

<u>Year</u>	<u>Amount</u>
1990	\$ 900.00
1991	\$ 945.00
1992	\$ 992.25
1993	\$1,041.86
1994	\$1,093.95
1995	\$1,148.65
1996	\$1,206.09
1997	\$1,266.39
1998	\$1,329.71
1999	\$1,396.19
2000	\$1,466.00
2001	\$1,539.30
2002	\$1,616.27
2003	\$1,697.08
2004	\$1,781.94
2005	\$1,871.03
2006	\$1,964.59

<u>Year</u>	<u>Amount</u>
2007	\$2,062.82
2008	\$2,165.96
2009	\$2,274.25

Maui Pine shall make such payment annually in advance on the 31st day of December of each year.

5.4. Transportation Fee. Maui Pine shall pay EMI quarterly on the first business days of January, April, July and October of each year a transportation fee for the use of the EMI Water Transmission System (the "Transportation Fee"). The Transportation Fee for the year 1990 shall be \$16 for each million gallons of water withdrawn by Maui Pine from the EMI Water Transmission System (the 1990 Transportation Fee"). The Transportation Fee shall be adjusted from year to year during the term of this Agreement (the "Adjusted Transportation Fee"). The Adjusted Transportation Fee shall be determined for each year (a "Year") during the remaining term of this Agreement as follows:

(a) "Index" means the Composite Producer Price Index published monthly by the United States Bureau of Labor Statistics, or any successor index.

(b) "Base Index" means the Index (expressed as the number 113.0) for the month of December 1989.

(c) The Index (expressed as a number) for the month of December of each Year shall be divided by 113.0 (the Base Index).

(d) The quotient resulting from the division described in (c) above (carried to four decimal places) shall be multiplied by the 1990 Transportation Fee, and the product shall be the Adjusted Transportation Fee for the next year.

#### Examples

The following examples illustrate the computations required above to determine Adjusted Transportation Fee.

#### 1991 Year

1. Assume 120 is the Index for the month of December 1990.

2. 113 is the Base Index.

3.  $\frac{120}{113} = 1.0619 \times \$16 = \$16.9911$

Adjusted Transportation Fee for Year 1991 is \$16.9911 for each million gallons of water.

1995 Year

1. Assume 150 is the Index for the month of December 1994.

2. 113 is the Base Index.

3.  $\frac{150}{113} = 1.3274 \times \$16 = \$21.2389$

Adjusted Transportation Fee for Year 1995 is \$21.2389 for each million gallons of water.

5.5. 1990 Payments. Upon the execution of this Agreement, Maui Pine shall pay to EMI all amounts due which have accumulated since the effective date of this Agreement (January 1, 1990). Such amounts owed shall be determined by this Agreement and not by any prior agreements or understandings. If any payments were made pursuant to any prior agreements, those payments shall be credited towards the amounts due under this Agreement.

6. Maui Pine Option To Use Additional Water. For the two-year period beginning January 1, 1990, Maui Pine shall have the option to use additional water from the EMI Water Transmission System upon the terms and conditions set out in this section. Any withdrawals of water under this section shall be from the Withdrawal Points.

6.1. Daily Measurement of Water Flow at Honopou. At 0700 hours each day, the aggregate rate of water flow through the Wailoa Ditch and the New Hamakua Ditch shall be measured (the "Honopou Measurement"). The Honopou measured daily flow shall be used to determine whether or not Maui Pine shall have the option to withdraw water in addition to that to which it is entitled pursuant to Section 4 of this Agreement.

6.2. Limitation to and Cost of Using Additional Water. Maui Pine shall have the right to use additional water depending on the aggregate rate of water flow as follows:

(b) "Base Index" means the Index (expressed as the number 113.0) for the month of December 1989.

(c) The Index (expressed as a number) for the month of December 1990 shall be divided by the Base Index.

(d) (i) The quotient resulting from the division described in (c) above (carried to four decimal places) shall be multiplied by \$100, and the product shall be the 1991 cost for water used pursuant to Section 6.2(a).

(d) (ii) The quotient resulting from the division described in (c) above (carried to four decimal places) shall be multiplied by \$538, and the product shall be the 1991 cost for water used pursuant to Section 6.2(b).

6.5. Payment for Additional Water. Maui Pine shall pay EMI quarterly, within thirty (30) days of EMI's billing date, for all water withdrawn under this Section 6.

7. Real Property Taxes. Maui Pine will pay when and as the same becomes due, all taxes and assessments of any kind or nature whatsoever levied and assessed against, upon and/or due with respect to the Nahiku Pipeline (Tax Map Key No. 1-2-4-10) and not with respect to any other property covered by this Agreement.

8. Maui Pine Liable for Gross Excise Tax on Receipts. Maui Pine shall be liable for and shall reimburse EMI for the Hawaii General Excise Tax (and any like or comparable tax or assessment) imposed on all payments paid to EMI under this Agreement. During such time as the Hawaii General Tax remains at its present rate of four percent (4%) and no other taxes or assessments are imposed upon the receipts by EMI of license fees and other payments due under this Agreement, the additional amount owed by Maui Pine to EMI will be equal to 4.167% of the license fees and other payments.

9. Temporary EMI Operation of Nahiku Pump. EMI shall operate the Nahiku Pump for Maui Pine during the period beginning

**Existing and Future Water Use**

Field	Acres	Year Planted	2004 Water Use	Future Water Use	Future Water Use
				Present to 2009	2010 to 2016
			Gallons /year	Gallons /year	Gallons /year
112	101	2006	0	75,729,800	75,729,800
119	140	2005	0	104,972,000	104,972,000
120	102	2005	0	76,479,600	76,479,600
215	84	2001	504,000	-	-
216	146	2000	876,000	-	-
217	139	2002	834,000	834,000	-
218	60	2002	360,000	360,000	-
219	106	2001	636,000	0	-
239	22	2001	132,000	16,495,600	16,495,600
240	54	2002	324,000	40,489,200	40,489,200
241	37	2003	222,000	27,742,600	27,742,600
242	144	2001	864,000	107,971,200	107,971,200
250	97	2000	64,369,200	72,730,600	72,730,600
251	43	2004	28,534,800	32,241,400	32,241,400
252	106	2000	70,341,600	79,478,800	79,478,800
253	97	2004	72,730,600	72,730,600	72,730,600
254	89	2004	66,732,200	66,732,200	66,732,200
261	97	2001	64,369,200	72,730,600	72,730,600
262	89	2000	59,060,400	66,732,200	66,732,200
263	153	1999	101,530,800	114,719,400	114,719,400
264	170	2003	127,466,000	127,466,000	127,466,000
270	134	2003	100,473,200	100,473,200	100,473,200
271	107	2004	80,228,600	80,228,600	80,228,600
581	97	2000 -2004	64,363,200	32,181,600	-
282	99	2002	1,584,000	-	-
284	70	2000	46,452,000	-	-
295	50	2000	33,180,000	49,820,000	49,820,000
296	109	2001	108,607,600	108,607,600	108,607,600
297	81	2004	53,751,600	80,708,400	80,708,400
299	36	2002	23,889,600	-	-
Total	2859		1,172,416,600	1,608,655,200	1,575,279,600
Gal/month			97,701,383	134,054,600	131,273,300
Gal/day			3,256,713	4,468,487	4,375,777
M-Gal/day			3.26	4.47	4.38

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COMPANY, INC.

BOARD OF LAND AND NATURAL RESOURCES

STATE OF HAWAII

In the Matter of the Contested Case  
Hearing Regarding Water Licenses at  
Honomanu, Keanae, Nahiku and Huelo,  
Maui

DLNR FILE NO. 01-05-MA

DIRECT TESTIMONY OF WESLEY M.  
NOHARA; CERTIFICATE OF SERVICE

**DIRECT TESTIMONY OF WESLEY M. NOHARA**

1. I, Wesley M. Nohara, am the Vice President of Production Management of Maui Pineapple Company, Ltd. ("MPC"), which is a wholly-owned subsidiary of Maui Land & Pineapple Company, Inc. ("MLP").<sup>1</sup> I have worked for MLP as a full-time employee for the past 26 years, and an additional ten years as a part-time seasonal employee. During my employment at MLP, I have been involved in issues related to water transported to MLP fields via the ditches, aqueducts, tunnels, and other facilities that are collectively known as the East Maui Irrigation Water Transmission System ("EMI System"). I provide this testimony based on my personal knowledge and am competent to testify on all matters stated herein.

<sup>1</sup> MPC intervened in this case along with MLP. The Hearings Officer recognized that MLP and MPC are separate companies, but ruled that MLP, as the parent corporation, could represent the interests of both. This testimony will refer to both companies collectively as "MLP."

## **MLP's Pineapple Business**

2. MLP is a local Maui company, tracing its roots back to the late 1800s when the Baldwin family began acquiring farmland in East and West Maui. Today, MLP's principal businesses include real estate and resort development through its subsidiary Kapalua Land Company, Ltd., and pineapple cultivation through its subsidiary Maui Pineapple Company, Ltd.

3. Maui's first pineapple was planted by the Baldwin family in 1890 in Ha'iku, in East Maui. In 1903, the Baldwins formed Haiku Fruit & Packing Company, the first commercial pineapple grower on the island. After acquiring more land in East Maui suitable for pineapple cultivation, in 1909 the Baldwins formed Keahua Ranch Company, Ltd., which changed its name in 1932 to Maui Pineapple Company, Ltd. ("MPC"). The company went public in 1969, again changing its name, this time to Maui Land & Pineapple Company, Inc. In 1975, MLP re-established MPC as its wholly-owned subsidiary devoted to pineapple and agricultural operations. MLP formed Kapalua Land Company, Ltd. at the same time to develop and manage MLP's resort and property businesses.

4. Through MPC, MLP is America's largest grower, processor and shipper of Hawaiian pineapple. MLP currently cultivates approximately 6,000 acres of pineapple on Maui; in excess of 2800 of those acres are in East Maui in proximity to the EMI System, and the remainder is in Central and West Maui. MLP is in the process of shifting its pineapple from a mix of the Champaka and Hawaiian Gold varieties into exclusively Hawaiian Gold (including some organically-grown Hawaiian Gold sold as Maui Organic). MLP is focusing most



of its production into the fresh fruit market, but processed pineapple will continue to be an integral part of MLP's business. By concentrating on the "value added" fresh market, MLP has been able to restore the financial viability of pineapple on Maui. To ensure that a relatively steady supply of fresh pineapple is ready for harvest, it is vital that MLP's water sources are sufficient, constant and dependable.

5. MLP is committed to continuing pineapple production on Maui. Within the past year, MLP has entered into negotiations for long-term leases of approximately 400 additional acres of agricultural lands in the Haliimaile, East Maui, area. The leased land is currently planted in other crops, and will be converted to pineapple. It is important to note that although MLP will need a constant source of water to grow pineapple on this leased land, MLP will use far less water growing pineapple than is currently used on the land for other crops.

#### **MLP's Water Use and Needs**

6. Factors involved in calculating MLP's water needs from the EMI System include water needs of the crop (pineapple), the ratio of MLP's fields lying fallow to those in cultivation, MLP's water conservation measures, and the location of MLP's fields in relation to MLP's available sources of water. Reviewing these factors shows that water from the EMI System is necessary for MLP to maintain a viable pineapple industry on Maui.

7. MLP currently grows two varieties of pineapple, both of which are extremely water efficient. Champaka pineapple requires approximately 2 acre-inches of water per month, which translates to approximately 1,800 gallons per

acre per day (“gpad”). To achieve the desired quality, and to maintain the rapid and uniform plant growth required to meet fresh fruit delivery schedules, Hawaiian Gold pineapple requires approximately 4 acre-inches of water per month, which translates to approximately 3,600 gpad. Other crops grown on a commercial basis on Maui use several times more water than does pineapple.

8. To state the water needs of pineapple in terms of the irrigation needs of MLP, a starting point is to calculate MLP’s maximum possible irrigation demand by assuming all 2,800-plus acres of MLP’s East Maui fields are under cultivation with Hawaiian Gold using only irrigation water (i.e. no rainwater). In that case, MLP would need more than 10 MGD of water (2,800 acres x 3,600 gpad = 10.08 MGD). The next step is to derive MLP’s actual irrigation needs by examining those factors that reduce MLP’s maximum possible irrigation needs.

9. First, at any given time approximately 25 percent of MLP’s pineapple fields are lying fallow. Pineapple grows and is harvested on an approximately three-year cycle. After each cycle, pineapple fields require a period of rest of approximately one year to restore nutrients and the health of the soil. During fallow periods, water usage is essentially zero.

10. Second, MLP reduces its need for irrigation water through strict conservation practices. MLP is continually looking for advances in horticulture and other sciences and technologies that will help it conserve water. MLP’s efforts make good sense, both from an environmental point of view and a business point of view. Water is an expensive and limited resource; it is in MLP’s interest to minimize its water use. Among the steps MLP has taken to reduce

water use include using primarily drip irrigation (except for a short period of time when overhead spray is needed to help new plants take root), applying mulch film/paper to reduce water loss, decrease weed growth and maintain optimal soil temperatures, and installing automated systems to reduce water use.

11. A third factor reducing MLP's total water needs is rainfall. MLP constantly adjusts irrigation use as dictated by weather conditions. In wet periods, MLP's irrigation needs are significantly reduced. Unfortunately, rainfall on Maui is unpredictable, intermittent, and irregular, which makes it unrealistic to assume rainfall as a constant factor in calculating MLP's water needs.

12. Taken together, the factors that reduce MLP's maximum irrigation needs result in MLP currently requiring approximately 3.5 MGD of irrigation water from the EMI System for its East Maui fields.

13. As MLP completes its transition to Hawaiian Gold pineapple and brings leased fields into cultivation, MLP predicts its water needs initially will rise by about 25 percent. From 2004 through 2009, MLP calculates that it will need 4.5 MGD of water in East Maui. After 2009, MLP's long-range plans call for certain fields that are not ideally suited to the Hawaiian Gold pineapple to be taken out of production. As a result, from 2009 to 2016, MLP calculates that its water needs will be reduced to approximately 4.4 MGD. MLP's 2004 water use, along with its future water needs calculations, are broken down by field in the spreadsheet attached as Exhibit E-1.

## MLP's Water Sources

14. The issues before the Hearings Examiner in this "interim relief" hearing relate to EMI System water diversions from six streams. Three of the streams are located in the vicinity of Huelo (Honopou, Pualua (Huelo) and Hanahoei), and three are located in the vicinity of Keanae (Wailuanui, Waiokamilo (both branches), and Palauhulu) (collectively the "Huelo/Keanae Streams"). MLP's withdrawals from the EMI system have very little impact on the Huelo/Keanae Streams – on many days MLP's withdrawals have no impact. To understand why this is so, it is necessary to understand MLP's use of the EMI system, both from a physical and a contractual point of view.

15. To irrigate its East Maui fields, MLP uses water drawn from a variety of sources. Although MLP uses the EMI System to transport nearly all of the water it uses to irrigate its East Maui fields, very little of MLP's irrigation water is surface water even potentially diverted from the Huelo/Keanae Streams. Most of the water is water pumped from MLP sources (well or stream pump) located outside of the Huelo/Keanae Stream watersheds. As discussed below, while the water MLP draws from the EMI System that is collected by EMI itself is not a majority of MLP's water use, it is nonetheless a necessary component of MLP's water requirements.

16. Under the License and Water Transmission Agreement effective January 1, 1990 and a series of modifications and extensions to that agreement<sup>2</sup> (collectively "MLP/EMI Agreement"), EMI transports and MLP withdraws two

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<sup>2</sup> Relevant excerpts of MLP's Water License Agreement with EMI and subsequent modifications and extensions are attached as Exhibits E-2 through E-6.

distinct “classes” of water from the EMI System. The first class is water that arises outside of the Huelo/Keanae Streams’ watersheds and is pumped into the EMI System by MLP itself. This water (referred to as “MLP Base Water”) represents the majority of MLP’s usage, and has no impact on the amount of water that is or is not diverted from the Huelo/Keanae Streams.

17. The second class of water MLP withdraws from the EMI System is water that MLP is contractually permitted to withdraw (for a fee) when flow in the EMI System exceeds 100 MGD (“High-flow Water”). This High-flow Water is the only water usage by MLP that potentially impacts the amount of water that is or is not diverted from the Huelo/Keanae Streams.

**MLP’s Base Water Withdrawals Do Not Impact the Huelo/Keanae Streams**

18. For its Base Water withdrawals, MLP uses the EMI System only to transport water from MLP’s sources to MLP’s fields. Under the MLP/EMI Agreement, MLP pays EMI a fee for water transport and MLP is permitted to withdraw 90% of the amount of water it contributes to the EMI System; the 10% reduction accounts for potential transport losses.

19. MLP pumps MLP Base Water into the EMI System from three sources. In terms of the EMI System, one of these sources, Haliimaile Well, is “downstream” (west of) not only of the Huelo/Keanae Streams but also of the entire proposed lease area. Water pumped from this well, transported by the EMI System and then later withdrawn by MLP therefore has no impact on the amount of water that is or is not diverted from the Huelo/Keanae Streams.<sup>3</sup>

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<sup>3</sup> Haliimaile Well is not a practical alternative source of High-flow Water for MLP, as discussed on pages 10-12 below.

20. The other two MLP sources, the Nahiku Pump and the Kuhiwa Well are "upstream" (east) of the Huelo/Keanae Streams' watersheds, and are shown on the map attached as Exhibit E-7. MLP pumps up to 1.5 MGD of water from these sources into the EMI System, subject to maximum set by the Commission on Water Resource Management of 180 million gallons per year.

21. MLP's Nahiku Pump diverts Hanawi Stream water into the EMI System. The Nahiku Pump has a maximum capacity of 0.5 million gallons per day (MGD), but average diversions by the Nahiku Pump during the past decade range from a low monthly average of 0.08 MGD in 1995 to a high monthly average of 0.28 MGD in 1999.

22. MLP's Kuhiwa Well draws from groundwater in the Makapii Stream watershed and is near the furthest (easternmost) operational reach of the EMI System. The Kuhiwa Well has been in operation since 1999, and has a maximum pumping capacity of 1.0 MGD. Actual deposits into the EMI System from the Kuhiwa Well have varied, from a low monthly average of 0.15 MGD to a high monthly average of 1.15 MGD in 2004. Kuhiwa Well is operated pursuant to a permit granted in October 1991 by the Commission on Water Resource Management. As a condition of the permit, the State of Hawaii and other parties have the right to monitor whether withdrawals from the well impact nearby streams, springs and other water resources. To the best of my knowledge, no detrimental effects have been reported.

23. MLP is not obligated to pump a minimum amount into the EMI System from the Nahiku Pump or Kuhiwa Well sources. Under this arrangement,

any increase or decrease of MLP's withdrawal Base Water from the EMI System is met with a corresponding increase or decrease in MLP's Base Water pumping from Nahiku Pump and Kuhiwa Well. Any changes to MLP's right to withdraw MLP Base water as a result of this interim proceeding would therefore result in no net effect on the Huelo/Keanae Streams.

**MLP High-flow Water Withdrawals Are Made Only in Periods of High Flow in the EMI System.**

24. In addition to its use of the EMI System to transport MLP Base Water, MLP also pays EMI for the right to withdraw "High-flow Water" from the EMI System. MLP's High-flow Water is water collected by EMI from the license areas, and is the only water MLP withdraws from the EMI System that potentially impacts the amount of water that is or is not diverted from the Huelo/Keanae Streams. Because of the fee structure for transporting this High-flow Water, which is explained below, MLP's use to date has been limited exclusively to periods when EMI System flows exceed 200 MGD. Periods when EMI System flows exceed 200 MGD generally correlate to periods of wet weather, when diversions likely will not be as problematic to taro farmers and other instream users.

25. MLP's right to withdraw High-flow Water is limited by the MLP/EMI Agreement to those times when the EMI System flow measured at Honopou<sup>4</sup> is greater than 100 MGD. EMI charges MLP a "tiered" fee for transporting the High-flow Water that is based on the total amount of water flowing in the entire EMI System; with higher fees when EMI System flow is between 100 MGD and

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<sup>4</sup> Honopou is located near the Maliko Gulch, and is the point where total EMI System flow for all ditches is measured.

200 MGD, and significantly lower fees when flow exceeds 200 MGD. In 2005, MLP pays EMI \$1,014.97 for each million gallons delivered when EMI System flows are between 100 MGD and 200 MGD, and \$188.65 for each million gallons delivered when EMI System flows exceed 200 MGD. Under the MLP/EMI Agreement, fees for each flow rate have risen over the years and will continue to rise in the future.

26. Because EMI's fees for High-flow Water are high when the EMI System flow is between 100 MGD and 200 MGD, MLP has withdrawn "High-flow Water" only when EMI System flow has exceeded 200 MGD. Based on payments to EMI, MLP use of High-flow Water over the past 10 years has varied from a high of 1.8 MGD to a low of 0.3 MGD.

27. Although MLP's use of MLP Base Water does not affect the amount diverted from the Huelo/Keanae Streams and the timing of MLP's High-flow Water withdrawals lessens impacts on the taro farmers and other instream users, a reduction in allowable diversions from the Huelo/Keanae Streams would have negative impacts on MLP's pineapple business. First, reduced diversions would result in lower overall EMI System flow, which in turn would reduce the amount of time EMI System flows are above 200 MGD and increase MLP's fees for water transport. Second, EMI has indicated in the past that a significant reduction in EMI System flow could threaten the economic viability of the EMI System. If economic considerations compelled EMI to abandon the EMI System, MLP would not be able to transport MLP Base Water or receive High-flow Water. The loss of this water would devastate MLP's East Maui pineapple business. Without



MLP Base Water or High-flow Water, MLP would not be able to farm pineapple in East Maui.

### **Alternative Sources of Water Are Not Feasible**

28. High-flow Water is the only water withdrawn by MLP that MLP believes should be at issue in this interim relief hearing. Although High-flow Water is only one portion of MLP's irrigation water use, it is essential to MLP's ability to maintain a financially viable pineapple business on Maui, and there are no feasible alternatives to its use.

29. As noted above, MLP pumps MLP Base Water from three sources. Each of these sources is permitted in the amount listed as its "capacity", and each was studied in connection with the issuance of its respective permit. The limit set by each permit represents the maximum amount of water MLP can withdraw from that source over a given period of time. While MLP does not withdraw the maximum amount from any source per year, it has withdrawn the maximum amount permitted over shorter periods of time. The periods of time when MLP does not withdraw the maximum from a particular source are periods when the maximum is not needed, either because rainfall is plentiful, fields served by that source are lying fallow, plants in a particular field are at a growth stage where less water is needed, or some other reason. Factoring in all of these issues, MLP is at the limit of its current water sources, and will in fact need more water in the future as it completes the transition to Hawaiian Gold that is necessary to maintain the financial viability of its pineapple business.

30. Development of new water sources that could impact the issues involved in this interim hearing is not feasible from a practical, financial, or timing point of view. First, development of a new surface water source is not realistic. The only watersheds that have significant surface water topographically "above" MLP's fields and could serve those fields are the watersheds from which the EMI System already draws. Even if the demands of taro farmers and other instream users can be met for particular streams, it is unlikely that withdrawals from other streams will be significantly increased. The demands on East Maui surface waters are too great and come from too many different interest groups and parties to anticipate that significant surface water will be made available by "shifting" the streams from which water is drawn within the East Maui watersheds.

31. Given the burdens on the East Maui watersheds, the only alternate source to consider is groundwater. As discussed above, MLP has developed wells in Central and East Maui. These wells provide the backbone of MLP's irrigation needs. Unfortunately, wells are exceptionally expensive to develop and put into service. If MLP were denied use of the High-flow Water it receives through the EMI System, MLP would be forced to seek new groundwater sources at great cost to the company. Costs associated with this development would threaten the long-term viability of MLP's pineapple business on East Maui.

32. Finally, even if MLP could justify drilling new wells from an economic point of view, there is no way a new well could come into service soon enough to impact the issues involved in the current interim relief hearing. The

interim relief hearing is to investigate whether water can be made available to Huelo and Keanae taro farmers and instream users now; it could take several years before a new well could provide an alternative source of water. Other practical and financial considerations stand in the way of new wells as a long-term solution, but simple timing precludes new wells from providing an interim solution.

### **Conclusion**

33. MLP is practicing good water stewardship and is committed to continue doing so. But despite growing a water-efficient crop, after implementing all reasonable conservation efforts, and after drawing on all alternative sources of water, MLP's ability to use High-flow Water from the EMI System remains necessary to MLP's ability to grow a commercially-viable pineapple crop on Maui.

### **Relief Requested**

34. MLP respectfully requests that the Hearings Examiner, to the extent he makes any adjustments to the diversions from the Huelo/Keanae Streams, make the following determinations and interim allocations with respect to MLP:

- a. MLP's right to withdraw Base Water from the EMI System is tied to the amount of water MLP pumps into the EMI System from sources located outside the Huelo/Keanae Streams, and does not affect the amount of water diverted from the Huelo/Keanae Streams. MLP's right to withdraw Base Water from the EMI System therefore is not affected by this Order.

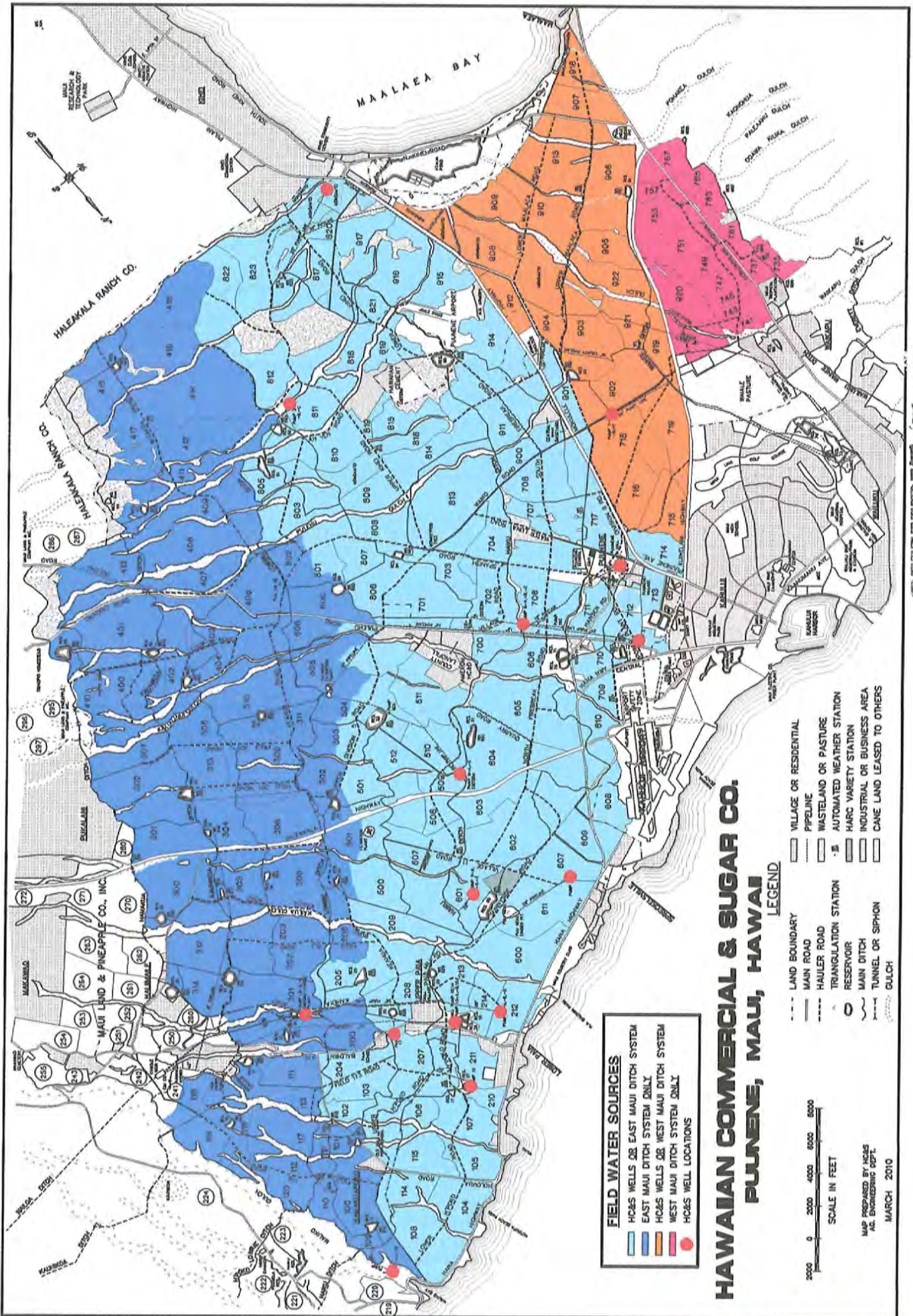
b. MLP has established an existing reasonable-beneficial use of all High-flow Water it currently is using and a need for additional amounts in the future. MLP currently withdraws High-flow Water only during periods when EMI System flows are above 200 MGD, which corresponds to periods of higher stream flows. MLP's withdrawal of High-flow Water during periods of high stream flow does not substantially affect the ability of the Na Moku Plaintiffs or the Maui Tomorrow Plaintiffs to exercise their rights with respect to waters from the Huelo/Keanae Streams. MLP's right to withdraw High-flow Water from the EMI System therefore is not affected by this Order.

DATED: Kahului, Hawai'i, August 1, 2005.



---

Wesley M. Nohara  
Vice President of Production Management  
Maui Pineapple Company, Ltd.



**FIELD WATER SOURCES**

- Light Blue: HCS WELLS OR EAST MAUI DITCH SYSTEM
- Medium Blue: EAST MAUI DITCH SYSTEM ONLY
- Orange: HCS WELLS OR WEST MAUI DITCH SYSTEM
- Pink: WEST MAUI DITCH SYSTEM ONLY
- Red Dot: HCS WELLS LOCATIONS

**HAWAIIAN COMMERCIAL & SUGAR CO.  
PUNENE, MAUI, HAWAII**

**LEGEND**

- LAND BOUNDARY
- MAIN ROAD
- HAULER ROAD
- TRANQUILIZATION STATION
- RESERVOIR
- MAIN DITCH
- TUNNEL OR SIPHON
- GULCH
- VILLAGE OR RESIDENTIAL
- PIPELINE
- WASTELAND OR PASTURE
- AUTOMATED WEATHER STATION
- HARC VARIETY STATION
- INDUSTRIAL OR BUSINESS AREA
- CANE LAND LEASED TO OTHERS

SCALE IN FEET  
0 2000 4000 6000 8000

MAP PREPARED BY HCS  
AT ENGRINGERS OPT.  
MARCH, 2010

**EXHIBIT E-109**

12/12/95 - [unclear] DC  
[unclear] - [unclear]  
[unclear] Draft - [unclear]  
[unclear] [unclear]

**EXHIBIT E-110**

THIRD AMENDMENT TO  
MEMORANDUM OF UNDERSTANDING

THIS AMENDMENT, made and entered into this \_\_\_\_\_ day of December, 1995, by and among EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation, whose mailing address is P. O. Box 266, Puunene, Hawaii 96784, referred to as "EMI," A&B-HAWAII, INC., through its division HAWAIIAN COMMERCIAL & SUGAR COMPANY, a Hawaii corporation, whose mailing address is P. O. Box 266, Puunene, Hawaii 96784, referred to as "HC&S," and the BOARD OF WATER SUPPLY of the County of Maui, whose principal place of business and mailing address is 250 S. High Street, Wailuku, Hawaii 96793, referred to as "BWS,"

W I T N E S S E T H:

WHEREAS, the Memorandum of Understanding entered into on December 31, 1973 by and among EMI, HC&S and BWS, which subsequently was amended by an Amendment dated May 1, 1992 and Second Amendment dated April 25, 1994, permits BWS to withdraw up to 16 million gallons of water per twenty-four hour period from the Wailoa Ditch System; and

WHEREAS, the Wailoa Ditch System provides, on average, 55% of HC&S's water needs, is essential to HC&S's ability to pump the groundwater wells which provide the other 45% of HC&S's water needs, and is necessary to run HC&S's two mills and pumps for HC&S's 16 brackish water wells in the central isthmus; and

WHEREAS, on numerous occasions, BWS's right to withdraw water from the Wailoa Ditch System has, during times of extended drought, put HC&S under severe stress; and

WHEREAS, the term of the Memorandum of Understanding is scheduled to terminate on December 31, 1995; and

WHEREAS, the parties hereto desire to extend the Memorandum of Understanding for a period of one year; now, therefore,

IN CONSIDERATION of the mutual promises and agreements hereinafter set forth, the parties hereto agree as follows:

1. The following sentence is hereby added to the end of the first paragraph of Paragraph 3:

"BWS agrees to use its best efforts to minimize its intake of water from the Wailoa Ditch System whenever the total flow in the Wailoa Ditch System drops below 55 million gallons per twenty-four hour period, and to use its best efforts to move forward on a timely basis with necessary steps, including the installation and utilization of surface water storage of peak flows, so

that BWS will be able to reduce its dependency on the Wailoa Ditch System whenever the total flow is below 55 million gallons per twenty-four hour period."

2. Paragraph 13 is hereby deleted in its entirety and substituted with the following:

"13. Term. The term of this agreement shall be for twenty-three (23) years commencing January 1, 1974 and terminating on December 31, 1996; provided, however, that this agreement may be extended from time to time by mutual agreement."

3. Save and except as amended herein, the Memorandum of Understanding, as previously amended, shall remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed on the date first above written.

EMI:

EAST MAUI IRRIGATION COMPANY,  
LIMITED

\_\_\_\_\_  
(Please type or print name above)

Its \_\_\_\_\_

\_\_\_\_\_  
(Please type or print name above)

Its \_\_\_\_\_

HC&S:

A&B-HAWAII, INC., THROUGH ITS DIVISION  
HAWAIIAN COMMERCIAL AND SUGAR COMPANY

\_\_\_\_\_  
\_\_\_\_\_  
(Please type or print name above)

Its \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
(Please type or print name above)

Its \_\_\_\_\_

BWS:

BOARD OF WATER SUPPLY,  
COUNTY OF MAUI

\_\_\_\_\_  
\_\_\_\_\_  
(Please type or print name above)

Its Chairperson

APPROVED AS TO FORM  
AND LEGALITY:

\_\_\_\_\_  
\_\_\_\_\_  
(Please type or print name above)

Its Deputy Corporation Counsel  
County of Maui



STATE OF HAWAII  
COUNTY OF MAUI

)  
) SS.  
)

On this \_\_\_\_\_ day of December, 1995, before me appeared \_\_\_\_\_ and \_\_\_\_\_, to me personally known, who, being by me duly sworn, did say that they are the \_\_\_\_\_ and \_\_\_\_\_, respectively, of EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

\_\_\_\_\_  
Notary Public, State of Hawaii

My commission expires: \_\_\_\_\_

STATE OF HAWAII  
COUNTY OF MAUI

)  
) SS.  
)

On this \_\_\_\_\_ day of December, 1995, before me appeared \_\_\_\_\_ and \_\_\_\_\_, to me personally known, who, being by me duly sworn, did say that they are the \_\_\_\_\_ and \_\_\_\_\_, respectively, of A&B-HAWAII, INC., through its division HAWAIIAN COMMERCIAL & SUGAR COMPANY, a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

\_\_\_\_\_  
Notary Public, State of Hawaii

My commission expires: \_\_\_\_\_

65





## Hawaiian Sugar furloughs 88 percent of its work force

By

POSTED: Saturday, December 13, 2008

While drought and reduced sugar production has forced the **Hawaiian Commercial & Sugar Co.**, the state's only remaining sugar producer, to furlough 88 percent of its employees, a top company official said yesterday that the company's long-term viability remains strong.

## Silversea Senior Cruises

### AT A GLANCE

- » **Name:** Hawaiian Commercial & Sugar Co.
- » **Parent company:** Alexander & Baldwin Inc.
- » **Distinction:** Hawaii's largest producer of raw sugar, accounting for more than 60 percent of all of the State's sugar.
- » **Employees:** Total 770
- » **Employees furloughed:** 674
- » **Percent furloughed:** 88%

The company plans to balance costs against reduced production by temporarily laying off 674 of its 770 member work staff for a week, said HC&S General Manager Frank Kiger. The staggered furloughs, which began last Monday, are expected to conclude by next Friday, he said.

"The furloughs have already started and the workers are very upset, especially during the holiday season," said Willie Kennison, head of the Maui Division of the International Longshore and Warehouse Union Local 142. "I can't ever remember another furlough of this size."

As many as 674 union and management workers out of the 770 employed at HC&S will be furloughed for one week each as part of the company's cost-saving measure, Kiger said.

"Those that will remain are people who work in the power plant as well as the company's planting operations," he said.

While, the long-term survival probability of HC&S remains strong, the company is emerging from its two worst drought years on record, Kiger said.

"Not only is 2008 the driest year on record, but it's 35 percent drier than any other year," he said. "Last year and this year were the two driest consecutive years in the history of HC&S."

As a result, production at HC&S is down by 25 percent, making it necessary for the company to implement its first large furlough in a decade, Kiger said.

While the company told Local 142 that the furloughs were drought related, Kennison said poor farm management practices have hurt the company's sugar production.

"We are concerned about the direction of the company," Kennison said. "They have roughly the same amount of acreage, but the crops have dropped every year and the yield has gone down drastically. Instead of utilizing their pumps to properly irrigate their fields, they are selling too much electricity to Maui Electric."

If the company does not change its farm management practices, Kennison said that it does not bode well for workers.

Last year workers saw their wages frozen and this year, if things do not improve, workers may see the company go after further reductions, Kennison said.

"With the economy the way that it is, workers can't afford to go without another wage increase," he said. "I've concerned that if the company doesn't fix its underlying problems that workers may see more



## Shocking French Video

If you don't know French, you've got to see this before it's gone!

You'll be really shocked after you watch it

[Watch Video](#)

EXHIBIT E-111

furloughs, layoffs or even closures."

Contract negotiations for 2009 begin in January, Kennison said. The current union contract expires this coming February, he said.

Kiger declined to address the union's allegations of mismanagement.

"Employee retention is a high priority for us," Kiger said. "We have good highly trained people and we want to retain all of them. We haven't had any permanent layoffs nor do we plan to do so."

In spite of current challenges, the forward outlook for HC&S is good, he said.

"We are a very viable company. We have a strong parent company in Alexander & Baldwin and our diversification into specialty sugar brings tremendous value to our product," Kiger said.

The company is the exclusive distributor of turbinado, sugar in the raw, and also has expanded its line of specialty products to include evaporated cane juice, a natural sweetener used in Hawaiian Sun and ItoEn brands and a host of other food and beverage products, Kiger said.

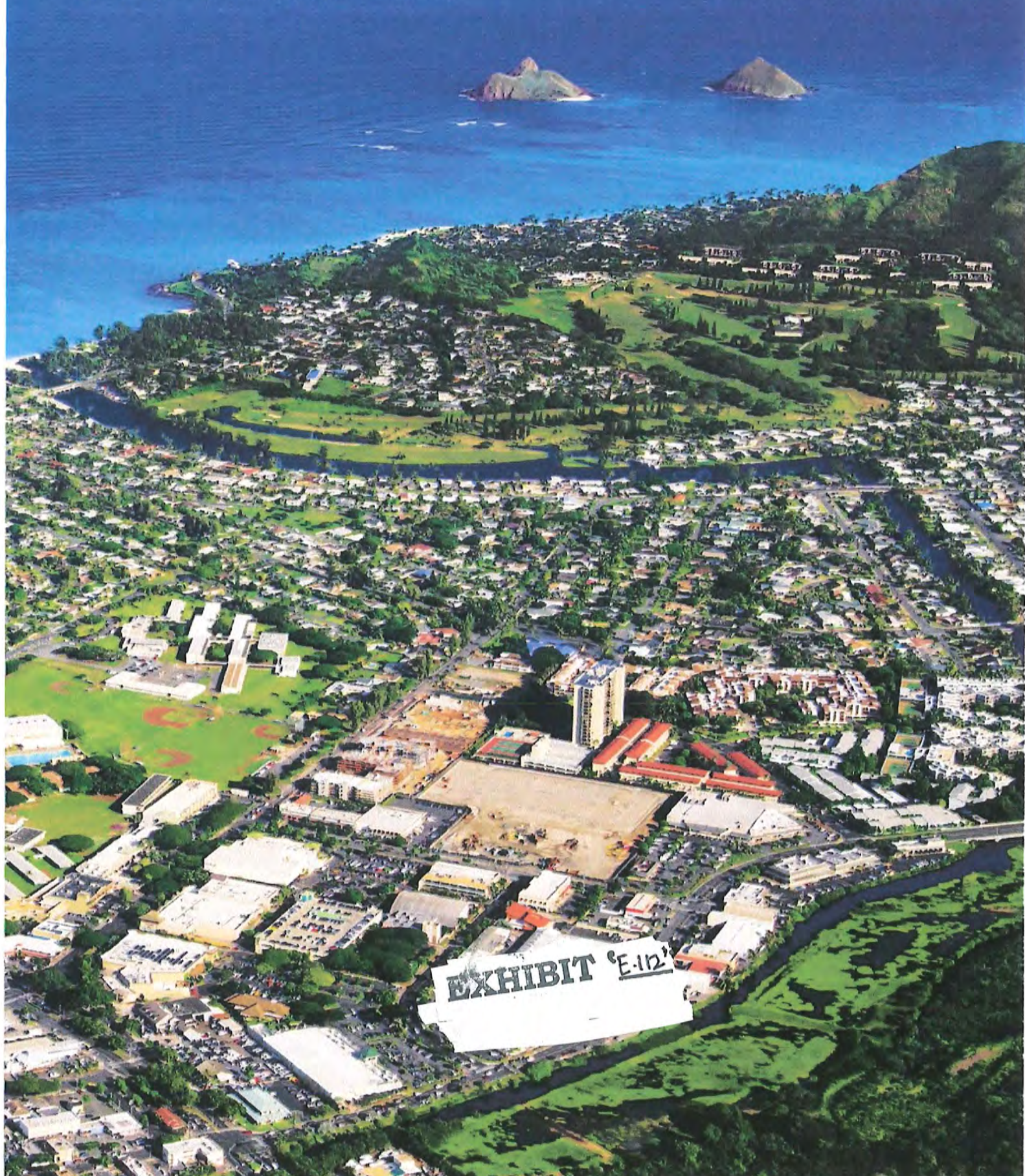
"There is a very strong market for these products," he said.



ALEXANDER & BALDWIN, INC.

2013 Annual Report + Form 10K

Focus on **HAWAII**



**EXHIBIT 'E-12'**

- increases in costs, including, but not limited to fuel, fertilizer, herbicide, and drip tubing;
- labor, including labor availability (see risk factor above regarding labor disruptions) and loss of qualified personnel;
- lack of demand for A&B's production;
- failure to comply with food quality and safety requirements;
- disease;
- uncontrolled fires, including arson;
- and weed control.

*A&B's ability to use or lease agricultural lands for agricultural purposes may be limited by government regulation.*

Given the large scale of its agricultural landholdings on Maui and Kauai, many of the third parties to whom A&B leases land for agricultural purposes may be characterized as large scale commercial agricultural operations. Recent legislation passed on Kauai, and introduced on Maui, places restrictions on the ability of such operations to use land within specified distances of highways, schools, oceans, streams, residences, parks, care homes, hospitals and other similar uses, to grow crops other than ground cover. This legislation also puts significant restrictions regarding, and public notification obligations concerning, pesticide use on such operations, and limits their ability to use genetically modified organism (GMO) crops. As a result, the ability of A&B to use or lease its lands for large scale agricultural purposes, and any rents that it can achieve for those lands, may be adversely affected by this and similar legislation.

*A&B's power sales contracts could be replaced on less favorable terms or may not be replaced.*

A&B's power sales contracts expire at various points in the future and may not be replaced or could be replaced on less favorable terms, which could adversely affect A&B's agribusiness operations. The State of Hawaii has approved power sales contracts with third parties that use a fixed price, rather than an avoided cost formula. Such a change in A&B's power sales contracts may adversely affect power revenue and provide less protection against internal power generation costs in a rising oil price market. As a result, A&B may consider decreasing or eliminating power sales on Maui in future years and, instead, use its power for field irrigation purposes, which would be expected to increase sugar yields.

*The market for power sales in Hawaii is limited.*

The power distribution systems in Hawaii are small and island-specific; currently, there is no ability to move power generated on one island to any other island. In addition, Hawaii law limits the ability of independent power producers, such as A&B's agribusiness operations, to sell their output to firms other than the respective utilities on each island, without themselves becoming utilities and subject to the State's Public Utilities Commission (PUC) regulation. Further, any sales of electricity by A&B to the utilities on each island are subject to the approval of the PUC. Unlike some areas in the Mainland, Hawaii's independent power producers have no ability to use utility infrastructure to transfer power to other locations.

*A&B has limited options for carriage of sugar to domestic markets.*

In order to directly ship bulk or partially processed food-grade sugar from Maui to markets on the U.S. West coast, or any alternate U.S. domestic port, A&B must utilize vessels that are subject to the restrictions delineated in Section 27 of the Merchant Marine Act, 1920, commonly referred to as the Jones Act. A&B currently owns a bulk sugar transportation vessel, the MV Moku Pahu, and therefore, A&B itself is also subject to the restrictions of the Jones Act. Under the Jones Act, all vessels transporting cargo between covered U.S. ports must, subject to limited exceptions, be built in the U.S., registered under the U.S. flag, manned by predominantly U.S. crews, and owned and operated by U.S.-organized companies that are controlled and 75 percent owned by U.S. citizens. U.S.-flagged vessels are generally required to be maintained at higher standards than foreign-flagged vessels and are supervised by, as well as subject to rigorous inspections by, or on behalf of, the U.S. Coast Guard, which requires appropriate certifications and background checks of the crew members. Because of these restrictions, A&B would have limited options for carriage of sugar to domestic markets if the MV Moku Pahu no longer qualified under the Jones Act or were taken out of service due to its age.

ALEXANDER & BALDWIN, INC.  
HONOLULU

TELEPHONE: (808) 579-9516  
FACSIMILE: (808) 579-9517

**EAST MAUI IRRIGATION COMPANY, LIMITED**  
P.O. BOX 791628, PAIA, MAUI, HAWAII 96779

January 21, 2008

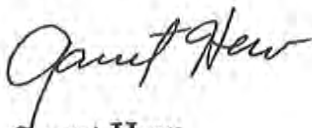
Mr. Ed Sakoda  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Sakoda,

Enclosed for your files are the Monthly Surface Water Use Report for the month of December 2007 for all gaging stations listed.

Please feel free to contact me at (808) 579-9516 should you have any questions.

Sincerely,



Garret Hew  
Manager

CC: Meredith Ching with enclosures  
Jeff Eng - DWS w/encls.

**EXHIBIT E-113**





**EAST MAUI IRRIGATION COMPANY, LIMITED**  
P.O. BOX 791628, PAIA, MAUI, HAWAII 96779

December 5, 2007

Mr. Ed Sakoda  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Sakoda,

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Sincerely,



Garret Hew  
Manager

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Jeff Eng - DWS w/encls.



**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
**Department of Land and Natural Resources**  
**MONTHLY SURFACE WATER USE REPORT**

**For Official Use Only:**

---

Report PID: \_\_\_\_\_

---

SWUR ID: \_\_\_\_\_

Name: Mr. Garret Hew

Company: East Maui Irrigation Co., Ltd.

Address: P.O. Box 791628  
Paia, HI 96779-0048

Telephone No.: (808) 579-9516 Fax No.: (808) 579-9517

Report Month: November Year: 2007

INSTRUCTIONS: Please TYPE OR PRINT CLEARLY. Complete this form to report total monthly surface water use, and, if required, other information from each of your surface-water sources. Mail to: Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809. For assistance, please call (808) 587-0234.

Gage ID*	Gage Name	Period Begin Date (mm/dd/yy)	Period End Date (mm/dd/yy)	Quantity Measured (gallons)	Method of Measurement**
6-18	Spreckels Ditch at Walluku	11/01/07	11/30/07	465.44	Flume Staff Gage
6-17	Waihee Ditch at Field 63 (Hopoi)	11/01/07	11/30/07	626.48	Flume Staff Gage
6-31	Olinda water to County of Maul	Info should come from County			
6-32	Lower Kula pipeline Piholo Reservoir	Info should come from County			
6-33	Walaloa Ditch	11/01/07	11/30/07	2897.97	Flume Staff Gage
6-34	New Hamakua Ditch	11/01/07	11/30/07	367.33	Flume Staff Gage
6-35	Lowrie Ditch	11/01/07	11/30/07	446.19	Flume Staff Gage
6-36	Haiku Ditch	11/01/07	11/30/07	134.86	Flume Staff Gage
6-37	Water pumped into Koolau Ditch @ Nahiku	Information Forthcoming	Info is retrieved quarterly		

\* The Gage ID should be obtained from the Commission on Water Resource Management.  
 \*\* Flow meter, electrical consumption, weir or flume, not metered (estimated).

Other comments or additional information (e.g., date and method of chloride measurement, how pumpage amounts are estimated, etc.):

Submitted by (print): Garret Hew

Signature: *Garret Hew*

Title: Manager

Date: 12/5/07

**EAST MAUI IRRIGATION COMPANY, LIMITED**  
P.O. BOX 791628, PAIA, MAUI, HAWAII 96779

January 21, 2008

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Department of Land and Natural Resources  
Commission on Water Resource Management  
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Sincerely,



Garret Hew  
Manager

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.



**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
 Department of Land and Natural Resources  
**MONTHLY SURFACE WATER USE REPORT**

**For Official Use Only:**

Name: Mr. Garret Hew  
 Company: East Maui Irrigation Co., Ltd.  
 Address: P.O. Box 791628  
Paia, HI 96779-0048  
 Telephone No.: (808) 579-9516 Fax No.: (808) 579-9517  
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Report PID:  
 SWUR ID:

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6-17	Waihee Ditch at Field 63 (Hopoi)	12/01/07	12/31/07	322.79 <i>Mg</i>	Flume Staff Gage
6-31	Olinda water to County of Maui	Info should come from County			
6-32	Lower Kula pipeline Piiholo Reservoir	Info should come from County			
6-33	Wailoa Ditch	12/01/07	12/31/07	4145.30 <i>Mg</i>	Flume Staff Gage
6-34	New Hamakua Ditch	12/01/07	12/31/07	885.33 <i>Mg</i>	Flume Staff Gage
6-35	Lowrie Ditch	12/01/07	12/31/07	320.68 <i>Mg</i>	Flume Staff Gage
6-36	Haiku Ditch	12/01/07	12/31/07	237.72 <i>Mg</i>	Flume Staff Gage
6-37	Water pumped into Koolau Ditch @ Nahiku	Information Forthcoming	Info is retrieved quarterly		

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 Other comments or additional information (e.g., date and method of chloride measurement, how pumpage amounts are estimated, etc.):

Submitted by (print): Garret Hew  
 Signature: *Garret Hew*

Title: Manager  
 Date: 1/17/08

**EAST MAUI IRRIGATION COMPANY, LIMITED**  
P.O. BOX 791628, PAIA, MAUI, HAWAII 96779

December 5, 2007

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Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

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Sincerely,



Garret Hew  
Manager

CC: Meredith Ching with enclosures  
Jeff Eng – DWS w/encls.



**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
**Department of Land and Natural Resources**  
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Other comments or additional information (e.g., date and method of chloride measurement, how pumpage amounts are estimated, etc.):

Submitted by (print): Garret Hew

Title: Manager

Signature: *Garret Hew*

Date: 12/5/07

# **Conservation District Use Application for Departmental Permit**

## **PROPOSED WAIKAMOI FLUME REPLACEMENT PROJECT, MAUI, HAWAII TMK (2) 2-4-016:002(por.), 003(por.), and 004(por.)**

**Prepared for:**

**County of Maui,  
Department of Water Supply**

**June 2012**

**Copyright © 2012,  
by Munekiyō & Hiraga, Inc.**



**EXHIBIT E-114**

**HCS-MTREQUEST-41-00001**

## PROPOSED USE

Please provide an executive summary of the proposed land use. Attach any site plans, landscaping plans, photographs, maps, and construction plans as needed.

### PROPERTY LOCATION, EXISTING USE, AND LAND OWNERSHIP

The County of Maui, Department of Water Supply (DWS) proposes the replacement of the existing Waikamoi Flume and various construction-related improvements (hereinafter referred to collectively as the "subject project" or "proposed action"). The existing flume, which is situated within the Koolau Forest Reserve, is located within a portion of Tax Map Key (TMK) parcel (2) 2-4-016:004 (Parcel 4) in East Maui, Hawaii. The existing flume stretches approximately 1.1 miles from its intake at Haipuaena Stream in the east to its termination in the vicinity of Waikamoi Stream in the west. The flume replacement will affect a corridor of land (hereinafter referred to as the "project site") approximately 1.1 miles long by 30 feet wide, spanning 15 feet to either side of the existing flume. Access to the project site is provided via an unimproved dirt and gravel road that extends approximately 3.9 miles east from the mauka (upland) terminus of Olinda Road. See **Figure 1** and **Figure 2**. Minor improvements to the access road such as re-graveling and minor grading may be performed as part of the proposed action to facilitate access for construction vehicles.

The project site (portion of Parcel 4) and upper section of the access road (running across portions of TMK (2)2-4-016:002, 003, and 004) are located within the State Conservation District. See **Figure 3**. The remaining lower section of the access road, as well as the temporary construction staging area for the project, are located outside of the Conservation District within the State Agricultural District.

The Waikamoi Flume is an integral component of the DWS Upper Kula system, conveying water produced by Waikamoi Forest in the East Maui watershed. Freshwater collected by the Waikamoi Flume from Haipuaena Stream and small tributary streams is conveyed to the nearby Waikamoi Reservoirs and then to the Kahakapao Reservoirs for storage. After being treated at the Olinda Water Treatment Plant, the water is conveyed by the Upper Kula system to serve Kula, Waiakoa, Keokea, Ulupalakua, and Kanaio in Upcountry Maui for domestic and irrigation purposes. Refer to **Figure 1**. The subject project is designed to provide an improved and more efficient water system that will ensure the continued supply of potable water to existing Upcountry Maui residents for domestic and irrigation purposes.

The Waikamoi Flume is located within an easement on Parcel 4 that was granted to the



County of Maui by East Maui Irrigation Company, Limited (EMI) in 1945. Lands underlying the portions of the access road in the Conservation District are owned by the State of Hawaii (Parcel 2) and A&B Hawaii, Inc. (Parcel 3).

**PROJECT NEED**

The existing Waikamoi Flume is approximately 1.1 miles long and consists of a redwood box section that measures 2 feet wide by 13 inches deep. The flume travels over rough terrain and meanders along the upland windward Haleakala mountainside. Timber bridges support the flume over gulches and gullies where abrupt changes in ground elevation preclude maintaining a constant slope for the flume. A topographic survey and site photos of the existing flume system are presented in **Exhibit "A"** and **Exhibit "B"**, respectively.

The Waikamoi Flume was originally constructed in the 1930s. The flume box and bridges were constructed out of redwood timbers and the foundations out of rock and concrete masonry. Later, in 1974 and 1975, the flume box was replaced with new redwood planking, although the foundations and footings of the timber bridges that were constructed in the 1930s were maintained in place. Today, due to years of weathering, the flume box and timber bridges are in poor condition. The timber flume box itself has been worn to the point where DWS estimates that during peak flows, approximately 40 percent of the water conveyed by the flume is lost through various cracks and holes along its length. Meanwhile, the timber bridges have become very dangerous for maintenance personnel to traverse.

The purpose of the subject project is two-fold: (1) to address leakage issues by providing an improved and more efficient flume that will be designed to carry approximately the same volume of water as the existing flume; and (2) to provide maintenance workers with a safe platform for accessing the flume along its entire length to perform routine maintenance. It is noted that the intake points along the flume will not be altered by the proposed action, such that the amount of water collected by the flume will not change.

The subject project is being undertaken in compliance with a directive issued by the State of Hawaii, Commission on Water Resource Management (CWRM) on May 25, 2010 that requires DWS to replace the Waikamoi Flume structure in order to reduce waste and system loss. See **Exhibit "C"**. The subject project is also consistent with the recommendations of the Draft Upcountry Water Use and Development Plan regarding continued leak detection and repair of DWS systems (Freedman 2009). Completion of the project will increase the efficiency of the existing Upper Kula water system and help ensure reliable provision of potable water service to existing Upcountry

FOURTH AMENDMENT TO  
MEMORANDUM OF UNDERSTANDING

THIS AMENDMENT, made and entered into this 20<sup>th</sup> day of December, 1996, by and between EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation, whose business mailing address is P. O. Box 266, Puunene, Hawaii 96784, referred to as "EMI," A&B-HAWAII, INC., through its division, HAWAIIAN COMMERCIAL & SUGAR COMPANY, a Hawaii corporation, whose mailing address is P. O. Box 266, Puunene, Hawaii 96784, referred to as "HC&S," and the BOARD OF WATER SUPPLY of the County of Maui, whose principal place of business and mailing address is 200 S. High Street, Wailuku, Hawaii 96793, referred to as "BWS,"

W I T N E S S E T H:

WHEREAS, on December 31, 1973, EMI, HC&S and BWS entered into that certain Memorandum of Understanding, which subsequently was amended by an Amendment dated May 1, 1992, Second Amendment dated April 25, 1994, Third Amendment dated January 3, 1996 and Agreement Re 1973 Memorandum of Understanding, Repairs to Waikamoi Water System, Construction of Reservoir at Kamole Weir dated March 21, 1996 (the Memorandum of Understanding, as so amended, is hereinafter referred to as the "Memorandum"), relating in part to the operation, maintenance and repair of the Waikamoi water system; and

WHEREAS, the term of the Memorandum is scheduled to terminate on December 31, 1996; and

WHEREAS, the parties hereto desire to extend the Memorandum for a period of one year; and

WHEREAS, on March 21, 1996, EMI, HC&S, and BWS entered into that certain Agreement Re 1973 Memorandum of Understanding, Repairs to Waikamoi Water System, Construction of Reservoir at Kamole Weir, relating to BWS using its best efforts to fund as expeditiously as possible the repairs currently necessary, in the discretion of EMI, to the Waikamoi Upper Flume, referred to as the "Flume"; and

WHEREAS, the Flume is under the operational jurisdiction of EMI as provided in the Memorandum; and

WHEREAS, the redwood covers, trestles, footings, braces, etc. of the Flume, are in need of replacement to maintain proper water transmission for the Upper Kula Water System; and

WHEREAS, the Flume is now in a state of major disrepair and there is concern that it may fail; and

WHEREAS, extensive and substantial damages to the Waikamoi collection and conveying and storage facilities owned by BWS due

**EXHIBIT E-115**

to acts of God or events beyond the control of EMI requiring restoration or replacement of the facilities is the responsibility of BWS; and

WHEREAS, EMI represents that, due to the sensitive nature of the ecological resources of the area serving as a source of domestic water, and its inaccessibility and varied terrain, EMI must limit access to its Waikamoi lands; and

WHEREAS, EMI reconstructed the Flume back in 1974-75, and is very familiar with both the Waikamoi water system and the area; and

WHEREAS, BWS has budgeted \$60,000.00 for the necessary maintenance and repair of the Flume for fiscal year 1996-1997; and

WHEREAS, BWS had previously purchased redwood lumber for the repairs to the Flume, which lumber was determined to be inadequate for said repairs; now, therefore,

IN CONSIDERATION of the mutual promises and agreements hereinafter set forth, the parties hereto agree as follows:

1. The fourth paragraph of Paragraph 2 is deleted in its entirety and substituted with the following:

"Extensive and substantial damages to the collection and conveying and storage facilities owned by BWS as provided herein due to acts of God or events beyond the control of EMI requiring restoration or replacement of the facilities shall be the responsibility of BWS. Actual restoration and replacement of existing facilities shall be subject to budgetary limitations of BWS, which agrees to exercise reasonable judgment and good faith to include the costs, or portions thereof, of restoration and replacement in the ensuing budget or budgets. Actual restoration and replacement of additional facilities constructed by EMI shall be made at the discretion of BWS, which decision shall be final and shall not be subject to arbitration. With regard to restoration of the Waikamoi Upper Flume required by damages, existing as of December 17, 1996, to the facilities (herein called the "1996 Repairs"), BWS shall use its best efforts to fund as expeditiously as possible the repairs deemed necessary in the discretion of EMI. BWS and EMI agree to begin the 1996 Repairs as soon as practicable and to coordinate with each other to undertake such repairs. If the Waikamoi Upper Flume fails or suffers a major disruption due to the delay in funding these necessary repairs, BWS shall not be permitted to compensate for the reduction of Waikamoi system water by taking water from the Wailoa Ditch System. The exact nature, scope and total cost of the 1996 Repairs, including total reasonable reimbursement

for labor (including overhead), will not be known until EMI proceeds with the repairs, but the cost during the fiscal year ending June 30, 1997 shall not exceed \$60,000.00."

2. With regard to the 1996 Repairs referred to in the new fourth paragraph of Paragraph 2 described above:

- a. EMI shall be responsible for designating the materials needed for the repairs, but shall not be responsible for any problems arising out of or related to the condition of the materials.
- b. BWS shall be responsible for ordering and purchasing all materials, including replacement of any materials that do not meet full specifications (e.g., replacement of that portion of BWS's previously-purchased lumber that EMI determines cannot be salvaged), and for the condition of the materials and delivery of same to the jobsite location designated by EMI, referred to as the "Jobsite."
- c. EMI shall, to the extent feasible in its sole discretion, salvage as much of BWS's previously-purchased redwood lumber (119 pieces 2"x12"x18' dimension, con heart, RS, and 279 pieces 2"x12"x20' dimension, con heart, RS), referred to as "Salvaged Lumber," for the repairs to the Flume, said salvage to include milling the redwood to proper dimensions at cost to BWS not to exceed \$2,500.00 for labor.
- d. BWS shall provide delivery of the Salvaged Lumber to the milling site designated by EMI, and later to the Jobsite.
- e. BWS shall provide a container for weather and security protection of all redwood lumber and all other materials delivered to the Jobsite for the repairs.
- f. EMI shall apply the non-skid surface treatment in accordance to the manufacture's recommendations.
- g. EMI shall be responsible for any loss or damage to materials accepted at the Jobsite in the event such loss or damage arises directly and solely from EMI's negligence, but EMI shall not be deemed a bailor or warehouseman with respect to such materials.
- h. BWS shall make payment on said invoices within 30 days after receipt, and agrees that interest will accrue on late payments at the rate of 12% per annum.

3. Paragraph 3 is hereby replaced in its entirety with the following:

"3. Wailoa Ditch. From the waters collected by EMI in the Wailoa Ditch System, EMI will make available to BWS up to 8-1/2 million gallons of water per twenty-four hour period, allocated as follows: up to 7 million gallons of water per twenty-four hour period from the Kamole Weir delivery point, and up to 1-1/2 million gallons of water per twenty-four hour period from the Hamakua Ditch delivery point to serve the needs of the Kula Agricultural Park (pursuant to the letter dated July 27, 1982 from HC&S and EMI to the Department of Water Supply of the County of Maui). The foregoing is subject to the limitations on withdrawal set forth in the Agreement Re 1973 Memorandum of Understanding, Repairs to Waikamoi Water System, Construction of Reservoir at Kamole Weir, dated March 21, 1996. BWS agrees to use its best efforts to minimize its intake of water from the Wailoa Ditch System whenever the total flow in the Wailoa Ditch System drops below 55 million gallons per twenty-four hour period, and to use its best efforts to move forward on a timely basis with necessary steps, including the installation and utilization of surface water storage of peak flows, so that BWS will be able to reduce its dependency on the Wailoa Ditch System whenever the total flow is below 55 million gallons per twenty-four hour period.

Waters from the Wailoa Ditch shall be delivered to BWS at the following points presently used by EMI/HC&S and BWS:

Kamole Forebay and Hamakua Ditch near Reservoir 40."

4. With regard to the construction of the proposed reservoir at Kamole Weir, BWS warrants that it will use its best efforts to meet, or cause to be met, the deadlines set forth in the engineering schedule attached hereto as Exhibit "A" and incorporated herein by reference. The parties agree to discuss modification of the '8-1/2 million gallons of water per twenty-four hour period' amount, referred to in Section 3 above, when the proposed reservoir comes on line.

5. Paragraph 13 is hereby deleted in its entirety and substituted with the following:


"13. Term. The term of this agreement shall be for twenty-four (24) years commencing January 1, 1974 and terminating on December 31, 1997; provided, however, that this agreement may be extended from time to time by mutual agreement."

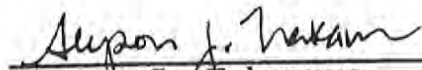
6. Save and except as amended herein, the Memorandum, as previously amended, shall remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed on the date first above written.

EMI:

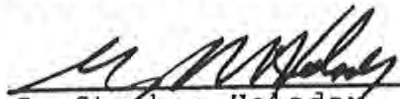
EAST MAUI IRRIGATION COMPANY,  
LIMITED

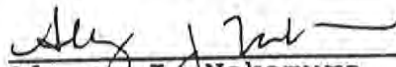
  
\_\_\_\_\_  
G. Stephen Holaday  
Its Vice President

  
\_\_\_\_\_  
Alyson J. Nakamura  
Its Secretary

HC&S:

A&B-HAWAII, INC., THROUGH ITS DIVISION  
HAWAIIAN COMMERCIAL AND SUGAR COMPANY

  
\_\_\_\_\_  
G. Stephen Holaday  
Its Senior Vice President

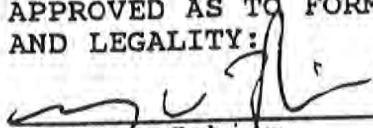
  
\_\_\_\_\_  
Alyson J. Nakamura  
Its Secretary

BWS:

BOARD OF WATER SUPPLY  
COUNTY OF MAUI

  
\_\_\_\_\_  
Norma Piltz  
Its Chairperson

APPROVED AS TO FORM  
AND LEGALITY:

  
\_\_\_\_\_  
Gary W. Zakian  
Deputy Corporation Counsel  
County of Maui

STATE OF HAWAII )  
City & County of Honolulu ) SS.  
~~COUNTY OF MAUI~~ )

On this 3rd day of ~~December, 1996~~ January, 1997 before me appeared <sup>G. Stephen Holada</sup>  
~~RICHARD F. CAMERON~~, to me personally known, who, being by me duly  
sworn, did say that he is the ~~Executive~~ Vice President of EAST  
MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation; that the  
seal affixed to the foregoing instrument is the corporate seal of  
said corporation; and that said instrument was signed and sealed  
on behalf of said corporation by authority of its Board of  
Directors, and the said officer acknowledged said instrument to  
be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official  
seal.

W

Stephen K. McQuinn  
Notary Public, State of Hawaii

My commission expires: 2/18/97

STATE OF HAWAII )  
CITY & COUNTY OF HONOLULU ) SS.

On this 30th day of December, 1996, before me appeared  
ALYSON J. NAKAMURA, to me personally known, who, being by me duly  
sworn, did say that she is the Secretary of EAST MAUI IRRIGATION  
COMPANY, LIMITED, a Hawaii corporation; that the seal affixed to  
the foregoing instrument is the corporate seal of said corpora-  
tion; and that said instrument was signed and sealed on behalf of  
said corporation by authority of its Board of Directors, and the  
said officer acknowledged said instrument to be the free act and  
deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official  
seal.

L.S.

Aileen S. Miyakawa  
Notary Public, State of Hawaii

My commission expires: 7/15/98

STATE OF HAWAII )  
City & County of Honolulu ) SS.  
~~COUNTY OF MAUI~~ )

On this 3rd day of ~~December, 1996~~, <sup>January, 1997</sup> before me appeared <sup>G. Stephen Holaday</sup> ~~RICHARD F. CAMERON~~, to me personally known, who, being by me duly sworn, did say that he is the Senior Vice President of A&B-HAWAII, INC., through its division HAWAIIAN COMMERCIAL & SUGAR COMPANY, a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officer acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

*Guyana K. McLaughlin*  
Notary Public, State of Hawaii

My commission expires: 2/18/97

43

STATE OF HAWAII )  
CITY & COUNTY OF HONOLULU ) SS.

On this 30th day of December, 1996, before me appeared ALYSON J. NAKAMURA, to me personally known, who, being by me duly sworn, did say that she is the Secretary of A&B-HAWAII, INC., through its division HAWAIIAN COMMERCIAL & SUGAR COMPANY, a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officer acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

L.S.

*Alyson J. Nakamura*  
Notary Public, State of Hawaii

My commission expires: 7/15/98



STATE OF HAWAII  
COUNTY OF MAUI

)  
) SS.  
)

On this 27th day of December, 1996, before me appeared Norma Piltz, to me personally known, who, being by me duly sworn, did say that she is the Chairperson of the BOARD OF WATER SUPPLY of the County of Maui, and that the seal affixed to the foregoing instrument is the lawful seal of the said BOARD OF WATER SUPPLY, and that the said instrument was signed and sealed on behalf of the said BOARD OF WATER SUPPLY, and the said Norma Piltz acknowledged the said instrument to be the free act and deed of the said BOARD OF WATER SUPPLY.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

*Joseph Pennington*  
Notary Public, State of Hawaii  
My commission expires: 4/19/98

*sw*

H. Hew

AGREEMENT RE 1973 MEMORANDUM OF UNDERSTANDING,  
REPAIRS TO WAIKAMOI WATER SYSTEM,  
CONSTRUCTION OF RESERVOIR AT KAMOLE WEIR

THIS AGREEMENT, made and entered into this 21st day of March, 1996, by and among A&B-HAWAII, INC., through its division HAWAIIAN COMMERCIAL AND SUGAR COMPANY, a Hawaii corporation, whose mailing address is P. O. Box 266, Puunene, Maui, Hawaii 96784, referred to as "HC&S", the BOARD OF WATER SUPPLY of the County of Maui, whose principal place of business and mailing address is 250 S. High Street, Wailuku, Hawaii 96793, referred to as the "BWS," EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation, whose mailing address is P. O. Box 266, Puunene, Hawaii 96784, referred to as "EMI," and KULAMALU, INC., a Hawaii corporation, whose mailing address is P. O. Box 1417, Wailuku, Hawaii 96793, referred to as "KULAMALU,"

WITNESSETH:

WHEREAS, this Agreement is being entered into in connection with the proposed Agreement Concerning the Construction of Storage Tank, Transmission Line and Appurtenances, and Improvement and Dedication of Existing Well, dated March 21, 1996, between BWS and Kulamalu, and the proposed Agreement Re Well Easement and Contribution to Design Work, dated March 21, 1996, between HC&S, EMI and Kulamanu, concerning the development of a well for BWS on land owned by HC&S ("Well Agreement"); and

WHEREAS, in connection with such Well Agreement, the parties have negotiated certain agreements relating to the following: (i) acceptance by BWS of certain terms and conditions relating to the use by BWS of water from the Wailoa Ditch System, (ii) funding by BWS of certain repairs to the Waikamoi water collection delivery

**EXHIBIT E-116**

system, and (iii) design and construction of a reservoir to serve Kamole Weir;

NOW, THEREFORE, IN CONSIDERATION of the mutual promises and agreements of the parties, the parties hereto agree as follows:

1. Amendment to 1973 Memorandum of Understanding. BWS, HC&S and EMI hereby amend the Memorandum of Understanding entered into on December 31, 1973 by and among EMI, HC&S and BWS ("1973 Memorandum of Understanding"), as follows:

(a) BWS shall not be permitted to withdraw more than 8 million gallons of water per twenty-four hour period from Wailoa Ditch under any circumstances. When the reservoir described in Section 3 below comes on line, the parties will discuss modification of the foregoing limitation in order to accommodate the reservoir.

(b) BWS shall not be permitted to withdraw water from Wailoa Ditch when the ditch flow drops below 11 million gallons of water per twenty-four hour period. This limitation is necessary in order to ensure sufficient water for the operation of HC&S' Puunene and Paia Mills, which provide 12% of the electricity consumed by the general public on Maui.

The limitations on withdrawal from Wailoa Ditch set forth above shall take effect at such time as Kulama<sup>n</sup>u (or its successors or assigns) begins to draw water from the BWS system for the parcels described in the Agreement Concerning the Construction of Storage Tank, Transmission Line and Appurtenances, and Improvement and Dedication of Existing Well, dated March 21, 1996, between BWS and Kulamalu.

2. Repairs to Waikamoi Water System. Notwithstanding any provision of the 1973 Memorandum of Understanding to the contrary, BWS hereby agrees to use its best efforts to fund as

expeditiously as possible the repairs currently necessary, in the discretion of EMI, to the Waikamoi Upper Flume. Said repairs shall include but not be limited to: replacement of the top cover of the Upper Flume, installation of non-slip surface on the Upper Flume cover, and replacement of portions of the Upper Flume trestle (i.e., braces, legs, runners, footings, etc.) as deemed necessary by EMI. The BWS and EMI agree to begin repairs as soon as practicable and to coordinate with each other to undertake such repairs.

3. Reservoir at Kamole Weir. BWS agrees to use its best efforts to seek and secure on a timely basis appropriate funding sources for the construction of the reservoir, and HC&S, EMI, and KULAMALU agree to provide reasonable and necessary support to obtain such funding sources. KULAMALU agrees to fund the design work, up to \$125,000, for the reservoir in coordination with BWS. BWS also agrees to use its best efforts to proceed with and to complete the construction of said reservoir as soon as possible.

IN WITNESS WHEREOF, the parties hereto have caused this

instrument to be duly executed on the date first above written.

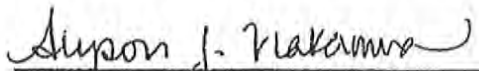
EMI:

EAST MAUI IRRIGATION COMPANY,  
LIMITED

  
Richard E. Cameron

(Please type or print name above)

Its Executive Vice President


  
Alyson J. Nakamura

(Please type or print name above)

Its Secretary

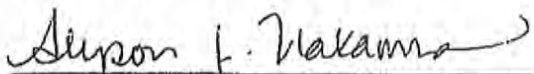
HC&S:

A&B-HAWAII, INC., THROUGH ITS DIVISION  
HAWAIIAN COMMERCIAL AND SUGAR COMPANY

  
Richard F. Cameron

(Please type or print name above)

Its Senior Vice President

  
Alyson J. Nakamura

(Please type or print name above)

Its Secretary

KULAMALU:

KULAMALU, INC.

Ernst R. Downie  
Ernst R. Downie  
(Please type or print name above)

Its PRESIDENT

\_\_\_\_\_  
(Please type or print name above)

Its \_\_\_\_\_

BWS:

BOARD OF WATER SUPPLY,  
COUNTY OF MAUI

Marie Timmey  
Marie Timmey  
(Please type or print name above)

Its Chairperson

APPROVED AS TO FORM  
AND LEGALITY:

GARY W. ZAKIAN  
(Please type or print name above)

Its Deputy Corporation Counsel  
County of Maui

STATE OF HAWAII )  
 ) SS.  
COUNTY OF MAUI )

On this 29th day of March, 1996, before me appeared Richard F. Cameron and \_\_\_\_\_, to me personally known, who, being by me duly sworn, did say that ~~they~~ is are the Ex. Vice President and \_\_\_\_\_ respectively, of EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

L.S.

Loralee K. Mawn  
Notary Public, State of Hawaii  
My commission expires: 9/6/96

STATE OF HAWAII )  
 ) SS.  
COUNTY OF MAUI )

On this 29th day of March, 1996, before me appeared Alyson T. Nakamura and \_\_\_\_\_, to me personally known, who, being by me duly sworn, did say that ~~they~~ she is are the Secretary and \_\_\_\_\_ respectively, of A&B-HAWAII, INC., through its division HAWAIIAN COMMERCIAL & SUGAR COMPANY, a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

L.S.

Loralee K. Mawn  
Notary Public, State of Hawaii  
My commission expires: 9/6/96

STATE OF HAWAII  
COUNTY OF MAUI

)  
) SS.  
)

On this 21<sup>st</sup> day of March, 1996, before me appeared Everett R Dowling and \_\_\_\_\_, to me personally known, who, being by me duly sworn, did say that they ~~are~~ the President and \_\_\_\_\_, respectively, of KULAMALU, INC., a Hawaii corporation; ~~that the seal affixed to the foregoing instrument is the corporate seal of said corporation;~~ and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation. *AWW*

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

*Jerry Ann Wells*  
\_\_\_\_\_  
Notary Public, State of Hawaii

My commission expires: 4/19/98

STATE OF HAWAII  
COUNTY OF MAUI

)  
) SS.  
)

On this 21<sup>st</sup> day of March, 1996, before me appeared Marie Kimmey, to me personally known, who, being by me duly sworn, did say that she is the Chairperson of the BOARD OF WATER SUPPLY of the County of Maui, and that the seal affixed to the foregoing instrument is the lawful seal of the said BOARD OF WATER SUPPLY, and that the said instrument was signed and sealed on behalf of the said BOARD OF WATER SUPPLY, and the said Marie Kimmey acknowledged the said instrument to be the free act and deed of the said BOARD OF WATER SUPPLY.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

*Jerry Ann Wells*  
\_\_\_\_\_  
Notary Public, State of Hawaii

My commission expires: 4/19/98



# ORIGINAL

## FIFTH AMENDMENT TO MEMORANDUM OF UNDERSTANDING

THIS AMENDMENT, made and entered into this 20<sup>th</sup> day of January, 1998, by and between EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation, whose business mailing address is P. O. Box 266, Puunene, Hawaii 96784, referred to as "EMI," A&B-HAWAII, INC., through its division, HAWAIIAN COMMERCIAL & SUGAR COMPANY, a Hawaii corporation, whose mailing address is P. O. Box 266, Puunene, Hawaii 96784, referred to as "HC&S," and the BOARD OF WATER SUPPLY of the County of Maui, whose principal place of business and mailing address is 200 S. High Street, Wailuku, Hawaii 96793, referred to as "BWS,"

### W I T N E S S E T H:

WHEREAS, on December 31, 1973, EMI, HC&S and BWS entered into that certain Memorandum of Understanding, which subsequently was amended by an Amendment dated May 1, 1992, Second Amendment dated April 25, 1994, Third Amendment dated January 3, 1996; Fourth Amendment dated December 30, 1996, Agreement Re 1973 Memorandum of Understanding, Repairs to Waikamoi Water System, Construction of Reservoir at Kamole Weir dated March 21, 1996, and Addendum to Fourth Amendment dated May 6, 1997 (the Memorandum of Understanding, as so amended, is hereinafter referred to as the "Memorandum"), relating in part to the operation, maintenance and repair of the Waikamoi water system; and

WHEREAS, the term of the Memorandum is scheduled to terminate on December 31, 1997; and

WHEREAS, the parties hereto desire to extend the Memorandum for a period of one year; and

WHEREAS, on March 21, 1996, EMI, HC&S, and BWS entered into that certain Agreement Re 1973 Memorandum of Understanding, Repairs to Waikamoi Water System, Construction of Reservoir at Kamole Weir, relating to BWS using its best efforts to fund as expeditiously as possible the repairs currently necessary, in the discretion of EMI, to the Waikamoi Upper Flume, referred to as the "Flume"; and

WHEREAS, BWS budgeted \$60,000.00 for the necessary maintenance and repair of the Flume for fiscal year 1996-1997; and

WHEREAS, BWS has budgeted \$60,000.00 for the necessary maintenance and repair of the Flume for fiscal year 1997-1998; and

WHEREAS, EMI has agreed to provide BWS with an additional 175,000 gallons per day from the Wailoa Ditch System;

NOW, THEREFORE, in consideration of the mutual promises and agreements hereinafter set forth, the parties agree as follows:

**EXHIBIT** E-117

1. The fourth paragraph of Paragraph 2 is deleted in its entirety and substituted with the following:

"Extensive and substantial damages to the collection and conveying and storage facilities owned by BWS as provided herein due to acts of God or events beyond the control of EMI requiring restoration or replacement of the facilities shall be the responsibility of BWS. Actual restoration and replacement of existing facilities shall be subject to budgetary limitations of BWS, which agrees to exercise reasonable judgment and good faith to include the costs, or portions thereof, of restoration and replacement in the ensuing budget or budgets. Actual restoration and replacement of additional facilities constructed by EMI shall be made at the discretion of BWS, which decision shall be final and shall not be subject to arbitration. With regard to restoration of the Waikamoi Upper Flume required by damages, existing as of December 17, 1996, to the facilities (herein called the "1996 Repairs"), BWS shall use its best efforts to fund as expeditiously as possible the repairs deemed necessary in the discretion of EMI. BWS and EMI agree to begin the 1996 Repairs as soon as practicable and to coordinate with each other to undertake such repairs. If the Waikamoi Upper Flume fails or suffers a major disruption due to the delay in funding these necessary repairs, BWS shall not be permitted to compensate for the reduction of Waikamoi system water by taking water from the Wailoa Ditch System. The exact nature, scope and total cost of the 1996 Repairs, including total reasonable reimbursement for labor (including overhead), will not be known until EMI proceeds with the repairs, but the cost during the fiscal year ending June 30, 1998 shall not exceed the sum of \$60,000,00 and any additional funds appropriated by the BWS during such fiscal year pursuant to its best efforts obligations to expeditiously fund the 1996 Repairs."

2. The first sentence of Paragraph 3 is hereby replaced in its entirety with the following:

"From the waters collected by EMI in the Wailoa Ditch System, EMI will make available to BWS up to 8.675 million gallons of water per twenty-four-hour period, allocated as follows: up to 7.175 million gallons of water per twenty-four-hour period from the Kamole Weir delivery point, and up to 1-1/2 million gallons of water per twenty-four-hour period from the Hamakua Ditch delivery point to serve the needs of the Kula Agricultural Park (pursuant to the letter dated July 27, 1982 from HC&S and EMI to the Department of Water Supply of the County of Maui)."

3. Paragraph 13 is hereby deleted in its entirety and substituted with the following:

"13. Term. The term of this agreement shall be for twenty-five (25) years commencing January 1, 1974 and terminating on December 31, 1998; provided, however, that this agreement may be extended from time to time by mutual agreement."

4. Save and except as amended herein, the Memorandum, as previously amended, shall remain in full force and effect.

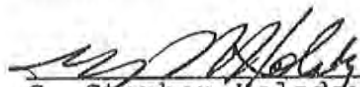
5. Facsimile signatures shall be deemed valid as original signatures. However, each party shall forward original signature pages to the other parties upon execution.

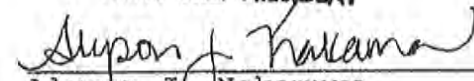
6. This Amendment may be executed in counterpart signature pages.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed on the date first above written.

EMI:

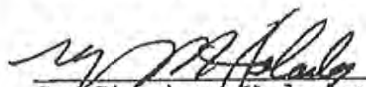
EAST MAUI IRRIGATION COMPANY,  
LIMITED

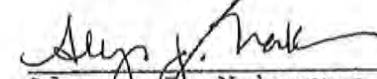
  
\_\_\_\_\_  
G. Stephen Holaday  
Its Vice President  
**EXEC. VICE PRESIDENT**

  
\_\_\_\_\_  
Alyson J. Nakamura  
Its Secretary

HC&S:

A&B-HAWAII, INC., THROUGH ITS DIVISION  
HAWAIIAN COMMERCIAL AND SUGAR COMPANY

  
\_\_\_\_\_  
G. Stephen Holaday  
Its Senior Vice President

  
\_\_\_\_\_  
Alyson J. Nakamura  
Its Secretary

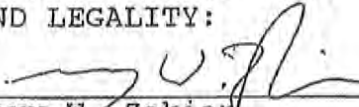
BWS:

BOARD OF WATER SUPPLY  
COUNTY OF MAUI



Dorvin D. Leis  
Its Chairperson

APPROVED AS TO FORM  
AND LEGALITY:

  
\_\_\_\_\_  
Gary W. Zakian  
Deputy Corporation Counsel  
County of Maui

STATE OF HAWAII )  
 ) SS:  
CITY & COUNTY OF HONOLULU )

On this 23rd day of February 1998, before me appeared G. STEPHEN HOLADAY, to me personally known, who, being by me duly sworn or affirmed, did say that he is the Executive Vice President of EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officer acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

L.S.

*Allen S. Miyahara*  
Notary Public, State of Hawaii

My Commission Expires: 7/15/98

STATE OF HAWAII )  
 ) SS:  
CITY & COUNTY OF HONOLULU )

On this 27th day of February 1998, before me appeared ALYSON J. NAKAMURA, to me personally known, who, being by me duly sworn or affirmed, did say that she is the Secretary of EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officer acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

L.S.

*Allen S. Miyahara*  
Notary Public, State of Hawaii

My Commission Expires: 7/15/98

STATE OF HAWAII )  
 ) SS:  
CITY & COUNTY OF HONOLULU )

On this 23rd day of February 1998, before me appeared G. STEPHEN HOLADAY, to me personally known, who, being by me duly sworn or affirmed, did say that he is the Senior Vice President of A&B-HAWAII, INC., a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officer acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

L.S.

*Adrian S. Miyahara*  
Notary Public, State of Hawaii

My Commission Expires: 7/15/98

STATE OF HAWAII )  
 ) SS:  
CITY & COUNTY OF HONOLULU )

On this 27th day of February 1998, before me appeared ALYSON J. NAKAMURA, to me personally known, who, being by me duly sworn or affirmed, did say that she is the Secretary of A&B-HAWAII, INC., a Hawaii corporation; that the seal affixed to the foregoing instrument is the corporate seal of said corporation; and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors, and the said officer acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

L.S.

*Adrian S. Miyahara*  
Notary Public, State of Hawaii

My Commission Expires: 7/15/98

STATE OF HAWAII )  
 ) SS.  
COUNTY OF MAUI )

On this 12<sup>th</sup> day of <sup>February</sup> ~~January~~, 1998, before me appeared <sup>sworn</sup> Dorvin D. Leis, to me personally known, who, being by me duly sworn, did say that he is the Chairperson of the BOARD OF WATER SUPPLY of the County of Maui, and that the seal affixed to the foregoing instrument is the lawful seal of the said BOARD OF WATER SUPPLY, and that the said instrument was signed and sealed on behalf of the said BOARD OF WATER SUPPLY, and the said Dorvin D. Leis acknowledged the said instrument to be the free act and deed of the said BOARD OF WATER SUPPLY.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

*Jerry Munnwell*

Notary Public, State of Hawaii

My commission expires: 4/19/98

*fl*

NUMBER OF SERVICES BY METER SIZE  
FISCAL YEAR ENDED JUNE 30, 2013

DISTRICT	5/8"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	TOTAL
<b>REGULAR SERVICE METERS</b>										
Wailuku	17,213	1,509	556	416	410	62	30	6	1	20,203
Makawao	8,686	319	179	70	27	12	3	1	0	9,297
Lahaina	2,680	245	133	126	122	26	9	2	0	3,343
Hana	509	12	8	6	4	1	0	0	0	540
Molokai	1,540	45	32	16	18	2	0	1	0	1,654
Subtotal	30,628	2,130	908	634	581	103	42	10	1	35,037
<b>AGRICULTURAL SERVICE METERS</b>										
Wailuku	31	10	9	5	3	2	1	0	0	61
Makawao	433	71	89	98	36	0	3	0	0	730
Lahaina	7	3	4	0	1	0	1	0	0	16
Hana	8	0	2	0	0	0	0	0	0	10
Molokai	7	3	2	0	0	0	0	0	0	12
Subtotal	486	87	106	103	40	2	5	0	0	829
<b>TOTAL</b>	<b>31,114</b>	<b>2,217</b>	<b>1,014</b>	<b>737</b>	<b>621</b>	<b>105</b>	<b>47</b>	<b>10</b>	<b>1</b>	<b>35,866</b>

EXHIBIT E-118





STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF LAND MANAGEMENT  
P. O. BOX 621  
HONOLULU, HAWAII 96809

August 23, 1985

Board of Land and  
Natural Resources  
State of Hawaii  
Honolulu, HI

Gentlemen:

MAUI

Subject: Sale of Lease (Water License) at Public  
Auction, Koolau Forest Reserve and Hanawi  
Natural Area Reserve, Hana and Makawao,  
Maui

STATUTE: Chapter 171, Hawaii Revised Statutes,  
as amended

FOR: Portion of the government land within the  
Koolau Forest Reserve and the Hanawi Natural  
Area Reserve as shown outlined in red on  
Department of Accounting and General Services,  
Survey Division, map HTS Plat 1067-A labeled  
Land Board Exhibit "A" appended to the basic  
file, being also the portion generally  
identified as the Nahiku, Keanae, Huelo and  
Honomanu License areas.

Tax Map Keys 1-1-01, 1-1-02, 1-2-04, 2-9-14

AREA:	Nahiku License	4,316 acres, more or less
	Keanae License	16,095 acres, more or less
	Huelo License	8,753 acres, more or less
	Honomanu License	<u>3,381</u> acres, more or less
	Total Area	32,545 acres, more or less.

(The total area subject to review and confirmation  
by the Department of Accounting and General  
Services, Survey Division.)

STATUS:

Nahiku License encumbered under Revocable  
Permit No. S-6165.

Keanae License encumbered under Revocable  
Permit No. S-6166.

Huelo License encumbered under Revocable  
Permit No. S-6167.

Honomanu License encumbered under General  
Lease No. S-3695.

ITEM F-5

EXHIBIT E-119

LAND TITLE STATUS: Subsection 5(b) of Admissions Act

ZONING: State Land Use Commission: Conservation  
County of Maui: Interim Zone - Unzoned

PURPOSE: Water License - right, privilege and authority to enter and go upon the above-described license areas for the purpose of developing, diverting, transporting and using government-owned waters. No development or diversion of water sources shall be permitted within the Hanawi Natural Area Reserve boundaries unless approved by the NARS Commission. (Exact language to be determined by the Attorney General.)

TERM: Thirty (30) years commencing on July 1, 1986 and ending on June 30, 2016.

MINIMUM ANNUAL RENTAL: To be determined by appraisal, same subject to review and acceptance of the Chairperson.

ADDITIONAL RENTAL: To be determined by appraisal, same subject to review and acceptance of the Chairperson.

RENTAL REOPENING: The minimum annual rental and the additional rental amount shall be subject to reopening and redetermination at the end of the tenth (10th) and twentieth (20th) year of the lease term; said redetermination to be made by appraisal.

PERFORMANCE BOND: A performance bond in an amount equal to two (2) times the minimum annual rental shall be posted by the Licensee within sixty (60) days from the effective date of the lease.

ENVIRONMENTAL ASSESSMENT/ ENVIRONMENTAL IMPACT STATEMENT: An Environmental Impact Statement or an Environmental Assessment, pursuant to Chapter 343, Hawaii Revised Statutes, shall be prepared and filed with the Office of Environmental Quality Commission prior to the disposition of the water license.

REMARKS: For the past 60 years or so, the taking of government-owned waters from the East Maui Watershed Area in the Koolau Forest Reserve on Maui has been covered under four (4) water licenses issued by the State. These four (4) licenses known as the Nahiku, Keanae, Huelo and Honomanu licenses were originally issued for a term of twenty-one (21) years and on a five (5)-year interval basis. The most recent twenty-one (21)-year term for the Keanae License (G.L. No. L-3349) expired on June 30, 1972 (1-year holdover period); the Nahiku License (G.L. No. L-3505) expired on June 30, 1977 (holdover period) and the Huelo License (G.L. No. L-3578)

expired on June 30, 1982 (holdover period). The Honomanu License (G.L. No. S-3695) covers a term of twenty-four (24) years and is due to expire on June 30, 1986.

The sale of new long-term leases for the Keanae, Nahiku and Huelo licenses have been held in abeyance for some time pending the final settlement of the McBryde (Hanapepe) water rights case. Meanwhile, these licenses have been covered under revocable permits issued on a yearly basis.

A decision adverse to the State's position relative to the Hanapepe water case was recently rendered by the 9th U. S. Circuit Court of Appeals. Although the State is expected to appeal this decision and the ultimate settlement of the water rights issue is not anticipated for some time, we believe that the sale of a long-term lease for the water licenses is in order instead of continuing the present method of providing interim coverage via revocable permits.

Instead of selling separate water licenses, we are proposing that the four (4) be incorporated into a single water license encompassing more or less the same geographical limits of the present license areas. We feel that it would be more desirable and advantageous to have all four (4) consolidated into a single license since the four (4) are all a part of the same collection and delivery system extending from Nahiku to Honopou inclusive.

It should be noted that there will be a reduction in the total acreage of the new license area since the makai boundary for the Huelo and Honomanu portions will generally follow the lowest level ditch, the Hana Belt Road or the Forest Reserve line instead of extending all the way to the sea. Also, approximately the easterly one-half (1/2) of the Nahiku portion will be deleted from the new license. The map labeled Land Board Exhibit "A" shows the proposed new license boundaries outlined in red with the old license boundaries outlined in yellow. The portion outlined in blue is the Hanawi Natural Area Reserve.

The Keanae, Nahiku, Huelo and Honomanu licenses are affected by and partly governed by the East Maui Water Agreement made in 1938 by the then Territory of Hawaii and East Maui Irrigation Company, Ltd. (EMI). This agreement provides for the joint use by the Territory and EMI of the aqueduct system

id also grants a perpetual right and easement to the Territory and EMI over and across each other's lands for the purposes of operating and maintaining the aqueduct system. This agreement was necessary since the aqueduct system runs partly through government land and partly through EMI lands. The agreement also enables the State to dispose of the water license at public auction instead of restricting the sale only to EMI.

We propose including as part of the new license, essentially all applicable terms and conditions of the Honomanu License (G.L. No. 8-3695) including provisions for the proper maintenance of the roads, trails and water system, the right to develop new water sources, protection of the watershed, the right of the State to issue further licenses, the right of EMI to use, operate and maintain on the licensed area, jointly with the State and others, the existing aqueduct system and all extensions thereof in accordance with the 1938 Agreement, the right of the State under certain limitations to withdraw at any time for domestic purposes including the watering of livestock, the government-owned surface and ground waters, the right of the State to withdraw during a water emergency and certain conditions, all or such portion of the government-owned water necessary to meet the emergency, availability to the State of all water measuring records, etc. and other provisions required by law.

We also propose including in the license additional provisions which will allow for public hunting and fishing within the license area, with these hunting and fishing rights including the rights-of-way to these areas to be coordinated with the State, requiring the prior approval of the State of all road construction, grading or clearing and development of new water sources within the license area.

A provision allowing the Licensee to sell to the County of Maui, certain amount of water under terms and conditions established by the State will also be included.

We have not determined at this time whether the minimum annual rental or the additional rental amount will be tied in to the price of sugar as in the past. The rationale and basis for establishing these rental amounts will be developed as part of the appraisal process.

For comparison purposes, we have attached a table showing the amount of government-owned waters taken from these license areas for the past ten (10) years including the total amount paid over this ten (10)-year period.

The Board should also be aware that a suit has been filed in Court by certain farmers and residents living in the East Maui area regarding the previous denial by the Board of their contested case hearing request covering the annual issuance of revocable permits for the Keanae, Naniku and Huelo water license areas.

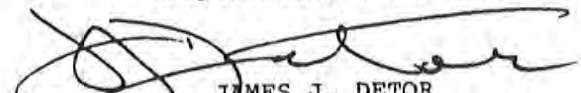
According to our Planning Act, a Conservation District Use Application (CDUA) for the continued and same use of the subject conservation-zoned lands is not necessary. However, the Licensee will be required to file a CDUA for the development and diversion of new or additional water sources, including major repairs or renovation to the existing system.

RECOMMENDATION:


That the Board:

- A. Find the area in question to constitute an economic unit in terms of the intended use.
- B. Authorize the sale of a lease (water license) at public auction covering the area in question under the above-listed terms and conditions which are by reference incorporated herein and in addition to the following terms and conditions:
  1. Provision for proper maintenance of the water system, development of water and other provisions listed under "Remarks."
  2. Compliance with all applicable laws, rules and regulations of the Federal, State and County governments including the Administrative Rules of the Department of Land and Natural Resources covering Conservation District lands and the Natural Area Reserves System Commission's Regulations covering the Hanawi Natural Area Reserve.
  3. Compliance with all applicable provisions of the Honomanu License (G.L. No. S-3695) including terms and conditions of the 1938 Agreement between the Territory of Hawaii and EMI as may be applicable.
  4. Disapproval by the State Legislature in any regular or special session following the date of sale.
  5. Filing of an Environmental Impact Statement or an Environmental Assessment pursuant to Chapter 343, Hawaii Revised Statutes.
  6. Other terms and conditions as may be prescribed by the Chairperson.

Respectfully submitted,

  
JAMES J. DETOR  
Land Management Administrator

APPROVED FOR SUBMITTAL:

  
SUSUMU ONO, Chairperson

Att:

## TABLE SHOWI

MOUNT OF GOVERNMENT WATER TAKE  
(Fiscal Years 74/75 - 84/85)

## JD AMOUNT PAID

	Fiscal Year	Water Taken (Million Gals.)	Amount Paid
<u>NAHIKU LICENSE:</u>	74/75	6,207	\$ 9,682.00
	75/76	6,578	\$ 10,261.68
	76/77	5,516	\$ 8,604.96
	77/78	5,401	\$ 10,800.00
	78/79	7,822	\$ 10,800.00
	79/80	8,072	\$ 10,800.00
	80/81	4,972	\$ 10,800.00
	81/82	7,314	\$ 10,800.00
	82/83	7,141	\$ 10,800.00
	83/84	7,219	\$ 11,817.00
	84/85	not available	\$ 12,348.00
	Total		66,242
Annual Average		6,624	\$ 10,683.06
<u>KEANAE LICENSE:</u>	74/75	11,537	\$ 26,400.00
	75/76	12,527	\$ 26,400.00
	76/77	10,853	\$ 26,400.00
	77/78	11,095	\$ 26,400.00
	78/79	14,214	\$ 26,400.00
	79/80	13,423	\$ 26,400.00
	80/81	9,915	\$ 26,400.00
	81/82	13,009	\$ 26,400.00
	82/83	12,721	\$ 26,400.00
	83/84	12,725	\$ 28,785.00
	84/85	not available	\$ 30,084.00
	Total		122,019
Annual Average		12,202	\$ 26,951.72
<u>HUELO LICENSE:</u>	74/75	13,068	\$ 52,350.41
	75/76	15,165	\$ 60,750.99
	76/77	13,680	\$ 54,802.08
	77/78	14,341	\$ 57,450.05
	78/79	16,553	\$ 66,311.32
	79/80	10,156	\$ 40,684.94
	80/81	13,022	\$ 52,166.13
	81/82	11,202	\$ 45,480.12
	82/83	17,430	\$ 54,000.00
	83/84	17,792	\$ 54,540.00
	84/85	not available	\$ 57,000.00
	Total		142,409
Annual Average		14,241	\$ 54,139.64
<u>HONOMANU LICENSE:</u>	74/75	3,735	\$ 12,325.50
	75/76	4,074	\$ 13,444.20
	76/77	4,046	\$ 13,351.80
	77/78	3,684	\$ 12,157.20
	78/79	5,948	\$ 19,628.40
	79/80	6,471	\$ 21,354.30
	80/81	3,246	\$ 10,711.80
	81/82	6,334	\$ 20,902.20
	82/83	5,208	\$ 17,186.40
	83/84	4,919	\$ 16,232.70
	84/85	not available	not available
	Total		47,665
Annual Average		4,767	\$ 15,729.45

D-16

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
Land Division  
Honolulu, Hawaii 96813

May 26, 2000

Board of Land and Natural Resources  
State of Hawaii  
Honolulu, Hawaii

MAUI

Issuance of Water Permits to Alexander & Baldwin, Inc. and East Maui Irrigation Company, Limited, for the Honomanu, Keanae, Huelo and Nahiku License Areas, Hana, Maui, Various Tax Map Keys.

APPLICANT:

ALEXANDER & BALDWIN, INC., a Hawaii corporation whose business and mailing address is 822 Bishop Street, P.O. Box 3440, Honolulu, Hawaii 96801.

EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation whose business and mailing address is P.O. Box 48, Paia, Hawaii 96779.

LEGAL REFERENCE:

Section 171-13, 171-55, and 171-58 Hawaii Revised Statutes, as amended.

LOCATION:

"Honomanu License" – Ko'olau Forest Reserve, Honomanu, Hana, Maui, Tax Map Key: 1-1-01: 44, as shown on the map labeled Exhibit A.

"Huelo License" – Ko'olau Forest Reserve, Huelo, Hana, Maui, Tax Map Key: 1-1-01: 50 and 2-9-14: 01, 05, 11, 12, & 17, as shown on the maps labeled Exhibit B and C.

"Keanae License" – Ko'olau Forest Reserve, Keanae, Hana, Maui, Tax Map Key: 1-1-02: Portion 02, as shown on the map labeled Exhibit D.

"Nahiku License" – Ko'olau Forest Reserve, Nahiku, Hana, Maui, Tax Map Key: 1-2-04: 05 & 07, as shown on the map labeled Exhibit E.

ITEM D-16

**EXHIBIT E-120**

AREA:

"Honomanu License" - 3,381.000 acres, more or less.

"Huelo License" - 8,752.690 acres, more or less.

"Keanae License" - 10,768.000 acres, more or less.

"Nahiku License" - 10,111.220 acres, more or less.

ZONING:

State Land Use District: Conservation District  
County of Maui CZO: Conservation

LAND TITLE STATUS:

Section 5(b) lands of the Hawaii Admission Act.

DHHL 30% entitlement lands pursuant to the Hawaii State Constitution:

YES X NO   

CURRENT USE STATUS:

"Honomanu License" - currently under water permit to East Maui Irrigation Co., Limited, which will expire on June 30, 2000.

"Huelo License" - currently under water permit to East Maui Irrigation Co., Limited, which will expire on June 30, 2000 and under Proclamation No. 00020 with the Division of Forestry and Wildlife.

"Keanae License" - currently under water permit to East Maui Irrigation Co., Limited, which will expire on June 30, 2000.

"Nahiku License" - currently under water permit to Alexander & Baldwin, Inc., which will expire on June 30, 2000.

CHARACTER OF USE:

Right, privilege, and authority for the development, diversion, and use of water purposes.

COMMENCEMENT DATE:

A maximum term of one (1) year, commencing on July 1, 2000 and terminating on June 30, 2001.



**MONTHLY RENT:**

To be determined by staff appraisal, subject to review and approval by the Chairperson.

**COLLATERAL SECURITY DEPOSIT:**

Twice the monthly rent.

**LIQUIDATED DAMAGES:**

Twenty percent (20%) of the monthly rent per day or three dollars (\$3.00) per day, whichever is greater.

**CHAPTER 343 - ENVIRONMENTAL ASSESSMENT:**

*The use does not differ from its previous use, therefore, pursuant to Section 11-200-8 (a)(1), of the Environmental Impact Statement Rules, Exempt Classes of Action, the applicant is exempt from the preparation of an environmental assessment.*

**DCCA VERIFICATION:**

**Alexander & Baldwin, Inc.**

Place of business registration confirmed:	YES	<u>X</u>	NO	___
Registered business name confirmed:	YES	<u>X</u>	NO	___
Applicant in good standing confirmed:	YES	<u>X</u>	NO	___

**East Maui Irrigation Company, Limited**

Place of business registration confirmed:	YES	<u>X</u>	NO	___
Registered business name confirmed:	YES	<u>X</u>	NO	___
Applicant in good standing confirmed:	YES	<u>X</u>	NO	___

**REMARKS:**

*The license areas are in a very complex situation since the four (4) areas are affected and partly governed by the East Maui Water Agreement made in 1939 by the then Territory of Hawaii and East Maui Irrigation Company, Limited (EMI). This agreement provides for the joint use by the Territory and EMI of the aqueduct system and also grants a perpetual right and easement to the Territory and EMI over and across each others' lands for the purposes of operating and maintaining the aqueduct system. This agreement was necessary since the aqueduct system traverses partly through government land and partly through EMI lands. The agreement also enabled the State to dispose of the water license at public auction instead of restricting the sale only to EMI.*

*The four (4) license areas were originally issued for a term of twenty-one (21) years and on a five (5) year interval basis. The most recent 21-year term for the following license areas were: "Honomanu License" which expired on June 30, 1986 under General Lease No. S-3695; "Huelo License" which expired on June 30, 1982 under General Lease No. S-1982; "Keanae License" which expired on June 30, 1972 under General Lease No. S-*

3349; and "Nahiku License" which expired on June 30, 1977 under General Lease No. S-3505.

*At its August 23, 1985 meeting under Agenda Item F-5, the Board approved the public auction sale of a thirty (30) year water license for the right to develop, divert, transport and use Government owned waters from the East Maui Watershed Area, situate within the Ko'olau Forest Reserve and the Hanawai Natural Area Reserve in the Hana District. The approval also included the incorporation of the four (4) areas into a single water license encompassing more or less the same geographical limits of the present license areas. It was decided that it would be more desirable and advantageous to have all four (4) areas consolidated into a single license since they were all a part of the same collection and delivery system extending from Nahiku to Honopou, inclusive.*

*The issuance of the thirty (30) year license by public auction had been pending at the request of the Attorney General's Office due to their concern regarding the settlement of the McBryde water case. Therefore, the right to take water from Government owned lands has been covered under four (4) revocable permits involving the "Honomanu, Huelo, Keanae and Nakiku License" areas. Additionally, Section 171-58 (c), Hawaii Revised Statutes, as amended, restricts the disposition of temporary water rights at a maximum of one (1) year. Accordingly, the issuance of these water permits for the four (4) "license" areas have since been alternated annually between A&B, Inc. and East Maui Irrigation Company, Limited. These water permits have commenced on July 1 and expired on June 30 of the following year.*

*Now that the McBryde water case has been settled, the Land Division has initiated the reopening of the thirty (30) year water license process. But while researching this matter, it was found that there is a pending court case involving its environmental assessment. The Attorney General's Office is still currently researching the status of this case and the next step to be taken.*

*Based on the foregoing information, the current water permits for the four (4) "license" areas will expire on June 30, 2000 and new permits are being requested by the applicants for the period of July 1, 2000 to June 30, 2001. Furthermore, as part of the approval, the subject permits shall cease and be void upon the issuance of a license for the rights to collect water from the subject lands by public auction.*

*Because the sale of the water license cannot be disposed prior to the expiration of these permits, the Board's authorization to issue separate water permits for the "Honomanu, Huelo, Keanae, and Nakiku License" areas are again being requested.*

**RECOMMENDATION:**

That the Board authorize the issuance of separate water permits to East Maui Irrigation Company, Limited for the "Nahiku License" area and Alexander & Baldwin, Inc. for the "Honomanu, Huelo and Keanae License" areas covering the subject areas described above for the right, privilege and authority for the development, diversion and use of water from the respective "license" area purposes under the terms and conditions cited above, which are by this reference incorporated herein and further subject to the following:

1. The standard terms and conditions of the most current revocable permit form, as may be amended from time to time;
2. Review and approval by the Department of Attorney General; and
3. Such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.
4. Compliance with all terms, covenants, conditions and agreements contained in each respective License's expired General Lease as described above.
5. The subject water permits shall cease and be void if the Board issues a water license pursuant to public auction for the right to collect water from the subject lands in accordance with Section 171-58, Hawaii Revised Statutes, as amended.
6. The State reserves the right, subject to not less than thirty (30) days written notice, since the permit term itself is only one (1) year, to withdraw water from the respective water permits to meet the following requirements as the State in its sole discretion may determine:

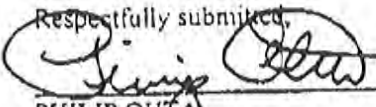

Constitutionally protected water rights, instream flow standards, reservations needed to meet the Department of Hawaiian Home Lands rights under Section 221 of the Hawaiian Homes Commission Act, as well as other statutorily or judicially recognized interests relating to the right to withdraw water for the purposes of and in accordance with the provisions of Section 171-58 (d), Hawaii Revised Statutes.

7. The permittee shall have full responsibility for the maintenance of roads used within the water license area.
8. The State reserves all hunting rights. In the event the State should declare the whole or any portion of the Premises as a public shooting grounds, the State reserves the right and privilege to issue written permits to hunters, subject to rules and regulations issued by the Department of Land and Natural Resources; provided, however, that open season shall be coordinated with the activities of the Permittee on the Premises.
9. That the standard Level One Hazardous Materials condition shall be reworded as such, "At any time during the term or upon termination of this permit, the Chairperson, for good cause, may require the Permittee to conduct at Permittee's own cost, a Level One (1) Hazardous Waste Evaluation and a complete abatement and disposal, if necessary, satisfactory to the standards required by the Federal Environmental Protection Agency, the Department of Health, and the Department of Land and Natural Resources. Termination of this permit will not be approved by the Board of Land and Natural Resources unless this evaluation and abatement provision has been executed where required."

BLNR - Water Permits  
A&B, Inc. and EMI

6

May 26, 2000

Respectfully submitted,  
  
PHILIP OHTA  
Maui District Land Agent  


APPROVED FOR SUBMITTAL:

  
TIMOTHY E. JOHNS, Chairperson



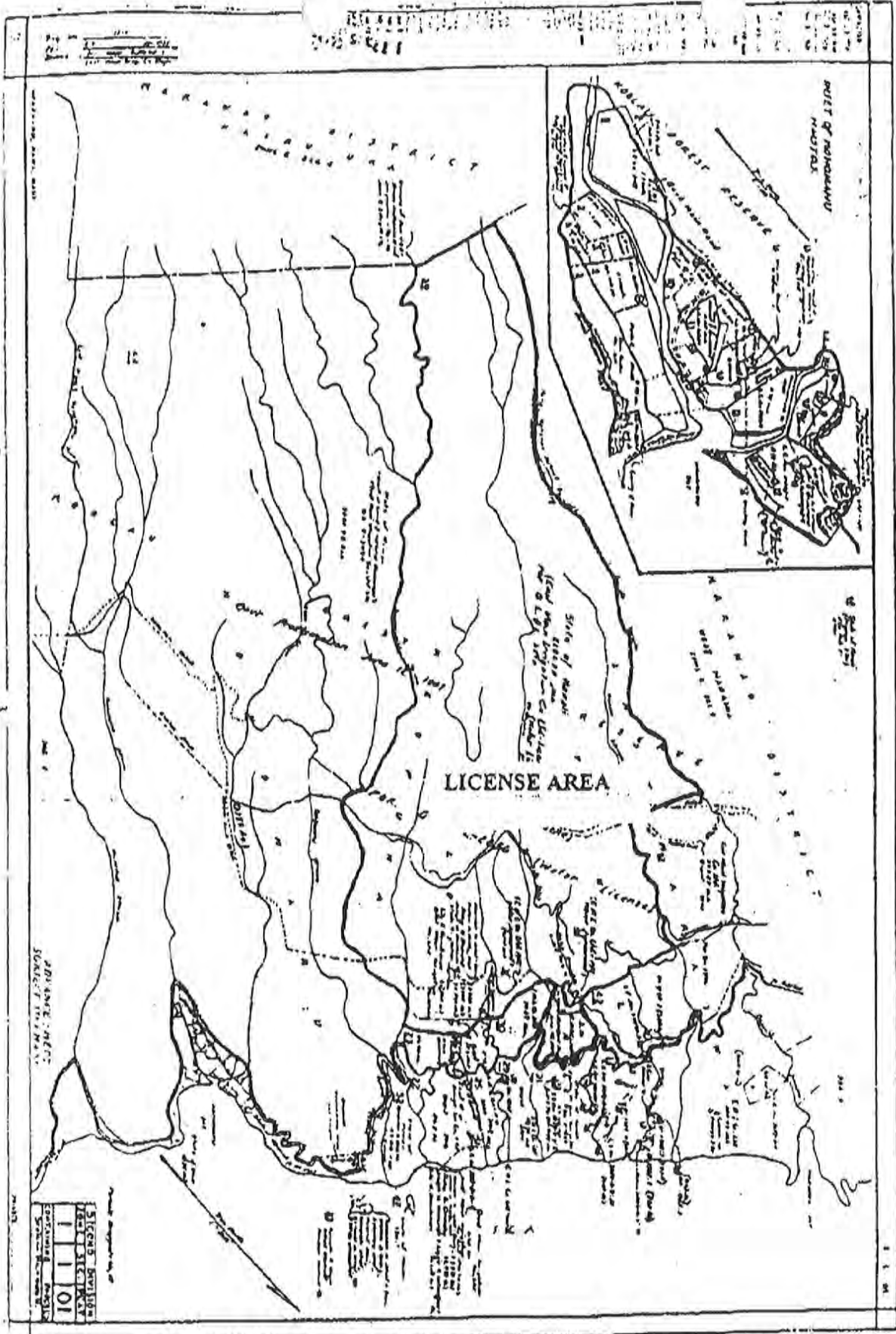


EXHIBIT B



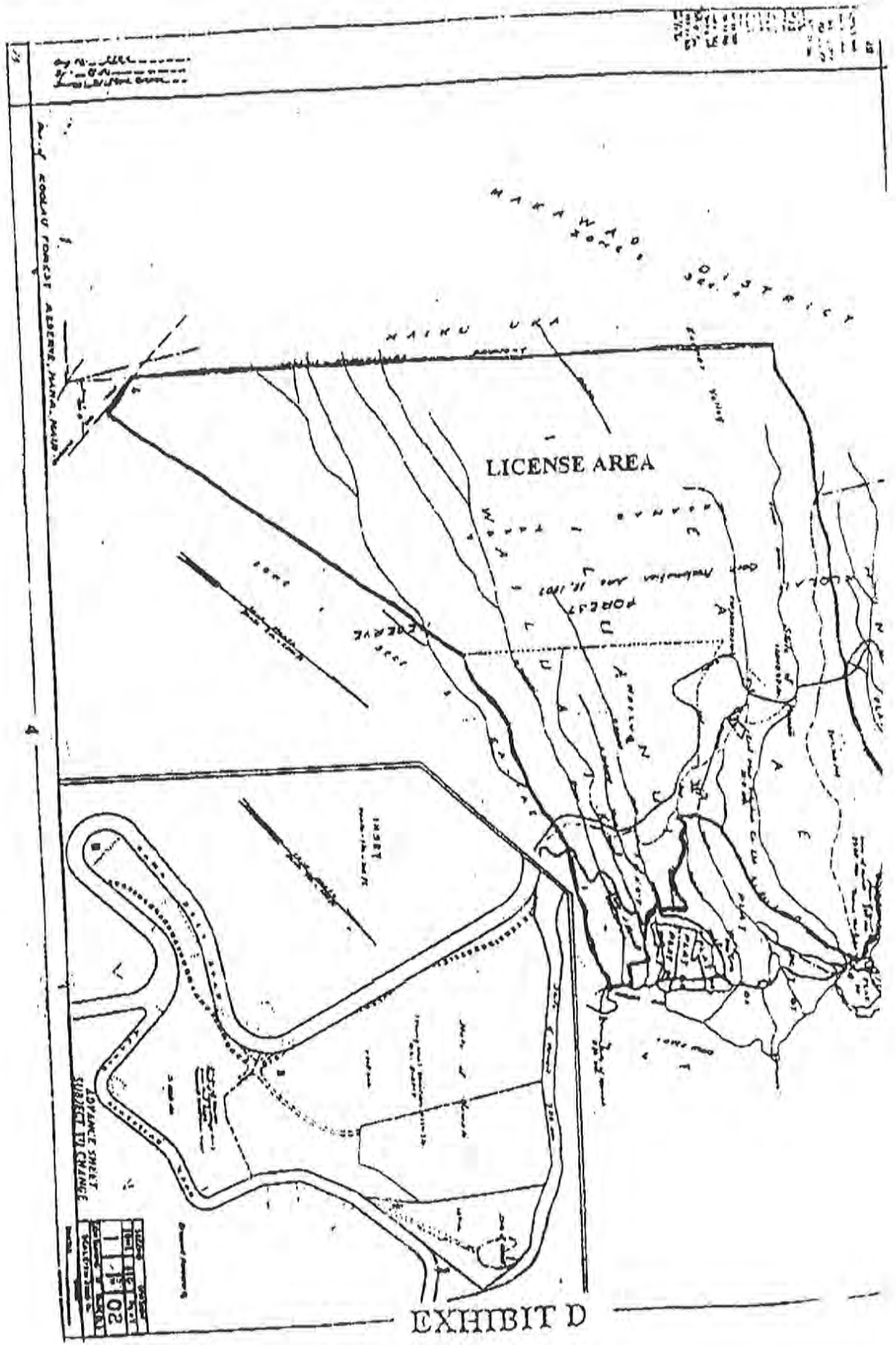
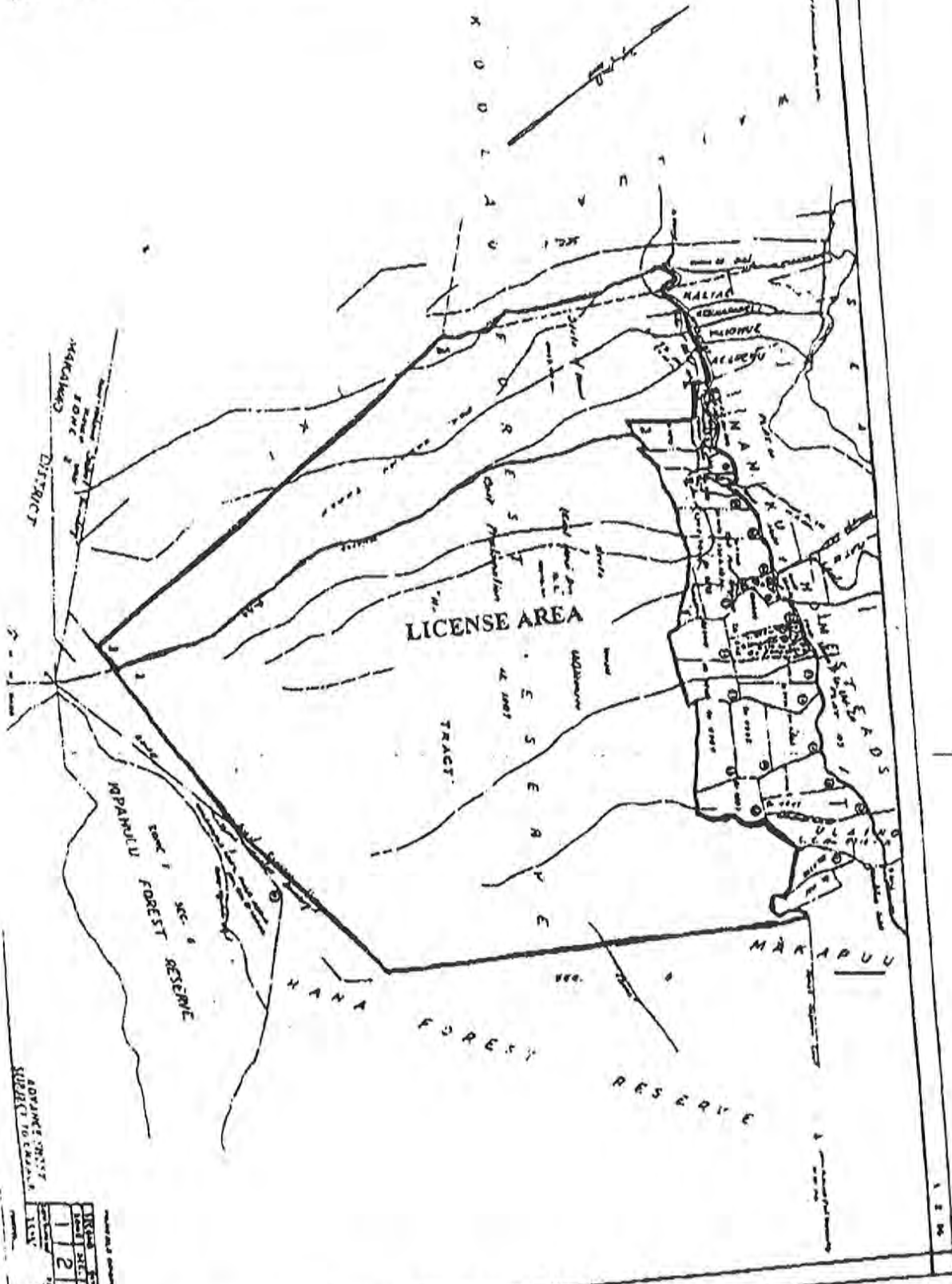


EXHIBIT D



Approved  
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DISTRICT  
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ADVANCE CRIST  
 SUBJECT TO CHANGE

TRACT	SECTION	ACRES
1	2	04

EXHIBIT E

D-5

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
Land Division  
Honolulu, Hawaii 96813

May 25, 2001

Board of Land and Natural Resources  
State of Hawaii  
Honolulu, Hawaii

MAUI

Discussion on Long-term Dispositions of Water Licenses and Issuance of Interim Revocable Permits to Alexander & Baldwin, Inc. and East Maui Irrigation Company, Limited, for the Honomanu, Keanae, Huelo and Nahiku License Arcas, Hana, Maui, Various Tax Map Keys.

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APPLICANTS:

ALEXANDER & BALDWIN, INC., a Hawaii corporation whose business and mailing address is 822 Bishop Street, P.O. Box 3440, Honolulu, Hawaii 96801.

EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation whose business and mailing address is P.O. Box 48, Paia, Hawaii 96779.

LEGAL REFERENCE:

Section 171-13, 171-55, and 171-58 Hawaii Revised Statutes, as amended.

LOCATION:

"Honomanu License" - Ko'olau Forest Reserve, Honomanu, Hana, Maui, Tax Map Key: 1-1-01: 44, as shown on the map labeled Exhibit A.

"Huelo License" - Ko'olau Forest Reserve, Huelo, Hana, Maui, Tax Map Key: 1-1-01: 50 and 2-9-14: 01, 05, 11, 12, & 17, as shown on the map labeled Exhibits B and C.

"Keanae License" - Ko'olau Forest Reserve, Keanae, Hana, Maui, Tax Map Key: 1-1-02: Portion 02, as shown on the map labeled Exhibit D.

"Nahiku License" - Ko'olau Forest Reserve, Nahiku, Hana, Maui, Tax Map Key: 1-2-04: 05 & 07, as shown on the map labeled Exhibit E.

ITEM D-5

**EXHIBIT E-121**

AREA:

"Honomanu License" - 3,381.000 acres, more or less.

"Huelo License" - 8,752.690 acres, more or less.

"Keanae License" - 10,768.000 acres, more or less.

"Nahiku License" - 10,111.220 acres, more or less.

ZONING:

State Land Use District: Conservation District  
County of Maui CZO: Conservation

LAND TITLE STATUS:

Section 5(b) lands of the Hawaii Admission Act.

DHHL 30% entitlement lands pursuant to the Hawaii State Constitution:

YES X NO    

CURRENT USE STATUS:

"Honomanu License" - currently under water permit [RP S-7263] to Alexander & Baldwin, Inc., which will expire on June 30, 2001.

"Huelo License" - currently under water permit [RP S-7264] to Alexander & Baldwin, Inc., which will expire on June 30, 2001, and under Proclamation No. 00020 with the Division of Forestry and Wildlife.

"Keanae License" - currently under water permit [RP S-7265] to Alexander & Baldwin, Inc., which will expire on June 30, 2001.

"Nahiku License" - currently under water permit [RP S-7266] to East Maui Irrigation Company, Ltd., which will expire on June 30, 2001.

CHARACTER OF USE:

Right, privilege, and authority for the development, diversion, and use of water purposes

COMMENCEMENT DATE:

A maximum term of one (1) year, commencing on July 1, 2001 and terminating on June 30, 2002.

MONTHLY RENT:

Honomanu License: \$1,698.32 per month, based on staff appraisal, dated 5/7/01  
Huelo License \$6,588.40 per month, based on staff appraisal dated 5/7/01.  
Keanae License \$3,476.72 per month, based on staff appraisal dated 5/7/01.  
Nahiku License \$1,426.88 per month, based on staff appraisal dated 5/7/01

COLLATERAL SECURITY DEPOSIT:

Twice the monthly rent

LIQUIDATED DAMAGES:

Twenty percent (20%) of the monthly rent per day or three dollars (\$3.00) per day, whichever is greater.

CHAPTER 343 - ENVIRONMENTAL ASSESSMENT:

The use does not differ from its previous use, therefore, pursuant to Section 11-200-8 (a)(1), of the Environmental Impact Statement Rules, Exempt Classes of Action, the applicant is exempt from the preparation of an environmental assessment

DCCA VERIFICATION:

Alexander & Baldwin, Inc.

Place of business registration confirmed:	YES	<u>X</u>	NO	___
Registered business name confirmed:	YES	<u>X</u>	NO	___
Applicant in good standing confirmed:	YES	<u>X</u>	NO	___

East Maui Irrigation Company, Limited

Place of business registration confirmed:	YES	<u>X</u>	NO	___
Registered business name confirmed:	YES	<u>X</u>	NO	___
Applicant in good standing confirmed:	YES	<u>X</u>	NO	___

REMARKS:

The applicants are now requesting for a long-term disposition via public auction on the subject East Maui Water License areas and the continued issuance of interim revocable permits on an annual basis, pending issuance of a long-term disposition. [see attached]

Background:

The license areas are in a very complex situation since the four (4) areas are affected and partly governed by the East Maui Water Agreement made in 1939 by the then Territory of Hawaii and East Maui Irrigation Company, Limited (EMI). This agreement provides for the joint use by the Territory and EMI of the aqueduct system and also grants a perpetual right and easement to the Territory and EMI over and across each others' lands for the purposes of operating and maintaining the aqueduct system. This agreement was necessary since the aqueduct system traverses partly through government land and partly

through EMI lands. The agreement also enabled the State to dispose of the water license at public auction instead of restricting the sale only to EMI.

The four (4) license areas were originally issued for a term of twenty-one (21) years and on a five (5) year interval basis. The most recent 21-year term for the following license areas were: "Honomanu License" which expired on June 30, 1986 under General Lease No. S-3695, "Huelo License" which expired on June 30, 1982 under General Lease No. S-3578; "Keanae License" which expired on June 30, 1972 under General Lease No. S-3349, and "Nahiku License" which expired on June 30, 1977 under General Lease No. S-3505

At its August 23, 1985 meeting, under Agenda Item F-5, the Board approved the public auction sale of a thirty (30) year water license for the right to develop, divert, transport and use Government owned waters from the East Maui Watershed Area, situate within the Ko'olau Forest Reserve and the Hanawi Natural Area Reserve in the Hana District. The approval also included the incorporation of the four (4) areas into a single water license encompassing more or less the same geographical limits of the present license areas. It was decided that it would be more desirable and advantageous to have all four (4) areas consolidated into a single license since they were all a part of the same collection and delivery system extending from Nahiku to Honopou, inclusive.

The issuance of the thirty (30) year license by public auction had been pending at the request of the Attorney General's Office due to their concern regarding the settlement of the McBryde water case. Therefore, the right to take water from Government owned lands has been covered under four (4) revocable permits involving the "Honomanu, Huelo, Keanae and Nahiku License" areas. Additionally, Section 171-58 (c), Hawaii Revised Statutes, as amended, restricts the disposition of temporary water rights at a maximum of one (1) year. Accordingly, the issuance of these water permits for the four (4) "license" areas are alternated annually between A&B, Inc. and East Maui Irrigation Company, Limited. These water permits have commenced on July 1 and expired on June 30 of the following year.

Now that the McBryde water case has been settled, the Land Division has initiated the reopening of the thirty (30) year water license process. But while researching this matter, it was found that there is a pending court case involving its environmental assessment. The Attorney General's Office is currently researching the status of this case and the next step to be taken.

At its regular meeting on May 26, 2000, under Agenda Item D-16, the Land Board approved, as amended, the issuance of Water Permits to Alexander & Baldwin, Inc., and East Maui Irrigation Company, Ltd, by adding a condition that the Department of the Attorney General issue an opinion regarding the compliance with Chapter 343, Hawaii Revised Statutes, as it relates to these water leases. The Attorney General has been reviewing the issue and will report on that review to the Land Board.

Further discussions on the matter resulted in the following: 1) That the Board and Department work towards a long-term resolution, clarifying all issues that have been raised concerning a long-term disposition; 2) That the Chairperson meet with interested parties to discuss instream and stream restoration issues; 3) That staff brief the Board about in-house appraisal process for Revocable Permits and that an independent appraisal of fair market value be required in the future when this issue is moved to a long-term

disposition; 4) That staff initiate discussions with DHFL, A&B/EMI, County of Maui, Commission on Water Resource Management and other interested parties in developing a watershed management plan for the water lease areas. Following are staff responses

- 1) The issues raised regarding long-term dispositions are those that are being discussed in this submittal;
- 2) The Former Chairperson met with taro farmers from the Keanae/Wailua area and the Native Hawaiian Legal Corporation, to inspect the water systems and streams to evaluate the current and future concerns. He then met with EMI and Maui Land Board Member to discuss the possibility of assisting with some stream maintenance/repair and the flow of water into the streams.
- 3) DLNR staff appraisers have or will be briefing the Land Board on the in-house appraisal process and have begun the process of contacting qualified independent appraisers to determine fair market value for long-term dispositions.
- 4) EMI prepared a preliminary East Maui Watershed Management Plan in 1993, after the East Maui Water Partnership was created in 1992. Members of the partnership then were EMI, State of Hawaii (DLNR-DOFAW), National Park Service, County of Maui, The Nature Conservancy, Keola Hana Maui, and Haleakala Ranch Co. The issues addressed were: 1) Watershed Resource Monitoring; 2) Animal Control; 3) Weed Control; 4) Management of Infrastructure; and 5) Public Education Awareness Program. Staff will continue to solicit comments from other agencies and interested parties, including the Department of Hawaiian Home Lands.

Further, the litigation and subsequent court ruling on the "Waiohole" case caused the staff appraiser to delay the appraisals for the current revocable permits, which is the reason why Revocable Permit Nos. S-7263 thru S-7266 inclusively, are currently being executed. There was an erroneous assumption that the "Waiohole" decision would have some impact on the valuations for the subject permits.

Based on the foregoing information, the current water permits for the four (4) "license" areas will expire on June 30, 2001 and new permits are being requested by the applicants for the period of July 1, 2001. Furthermore, as part of the approval, the subject permits shall cease and be void upon the issuance of a license for the rights to collect water from the subject lands by public auction.

Because the sale of the water license cannot be disposed prior to the expiration of these permits, the Board's authorization to issue separate water permits for the "Honomanu Huelo, Keanae, and Nakiku License" areas is again being requested.

#### RECOMMENDATION

That the Board authorize the issuance of separate water permits to East Maui Irrigation Company, Limited, for the "Honomanu, Huelo, and Keanae License" areas and

Alexander & Baldwin, Inc. for the "Nahiku License" area covering the subject areas described above for the right, privilege and authority for the development, diversion and use of water from the respective "license" area purposes under the terms and conditions cited above, which are by this reference incorporated herein and further subject to the following:

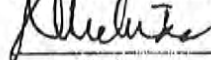
1. The standard terms and conditions of the most current revocable permit form, as may be amended from time to time;
2. Review and approval by the Department of Attorney General; and
3. Such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.
4. Compliance with all terms, covenants, conditions and agreements contained in each respective License's expired General Lease as described above.
5. The revocable permits shall cease and be void if the Board issues a lease pursuant to public auction for the right to collect water from the lands under Section 171-58, Hawaii Revised Statutes.
6. The State reserves the right to withdraw water from these revocable permits to meet the following requirements as the State in its sole discretion may determine:


Constitutionally protected water rights, instream flow standards, reservations needed to meet the Department of Hawaiian Home Lands rights under Section 221 of the Hawaiian Homes Commission Act, as well as other statutorily or judicially recognized interests relating to the right to withdraw water for the purposes of and in accordance with the provisions of Section 171-58 (d), Hawaii Revised Statutes

7. The Permittee shall be fully responsible for the maintenance of roads used within the water license areas.
8. The State reserves all hunting rights. In the event the State should declare the whole or any portion of the Premises as a public shooting grounds, the State reserves the right and privilege to issue written permits to hunters, subject to rules and regulations issued by the Department of Land and Natural Resources; provided, however, that open season shall be coordinated with the activities of the Permittee on the Premises.
9. That the standard Level One Hazardous Materials condition shall be reworded as follows: "At any time during the term or upon termination of this permit, the Chairperson, for good cause, may require the Permittee to conduct at Permittee's own cost, a Level One (1) Hazardous Waste Evaluation and a complete abatement and disposal, if necessary, satisfactory to the standards required by the Federal Environmental Protection Agency, the Department of Health, and the Department of Land and Natural Resources. Termination of this permit will not be approved by the Board of Land and Natural Resources unless this evaluation and abatement provision has been executed where required".

10. Subject to any amended instream flow standard set by the Commission on Water Resource Management that affects the state waters under this revocable permit/lease.
- 11 The Permittee shall comply with all requirements of the State Water Code, section 174C, Hawaii Revised Statutes, and other laws governing water in Hawaii.

Respectfully submitted,



 Louis Wada  
Maui District Land Agent

APPROVED FOR SUBMITTAL.

  
GILBERT S. COLOMA-AGARAN, Chairperson





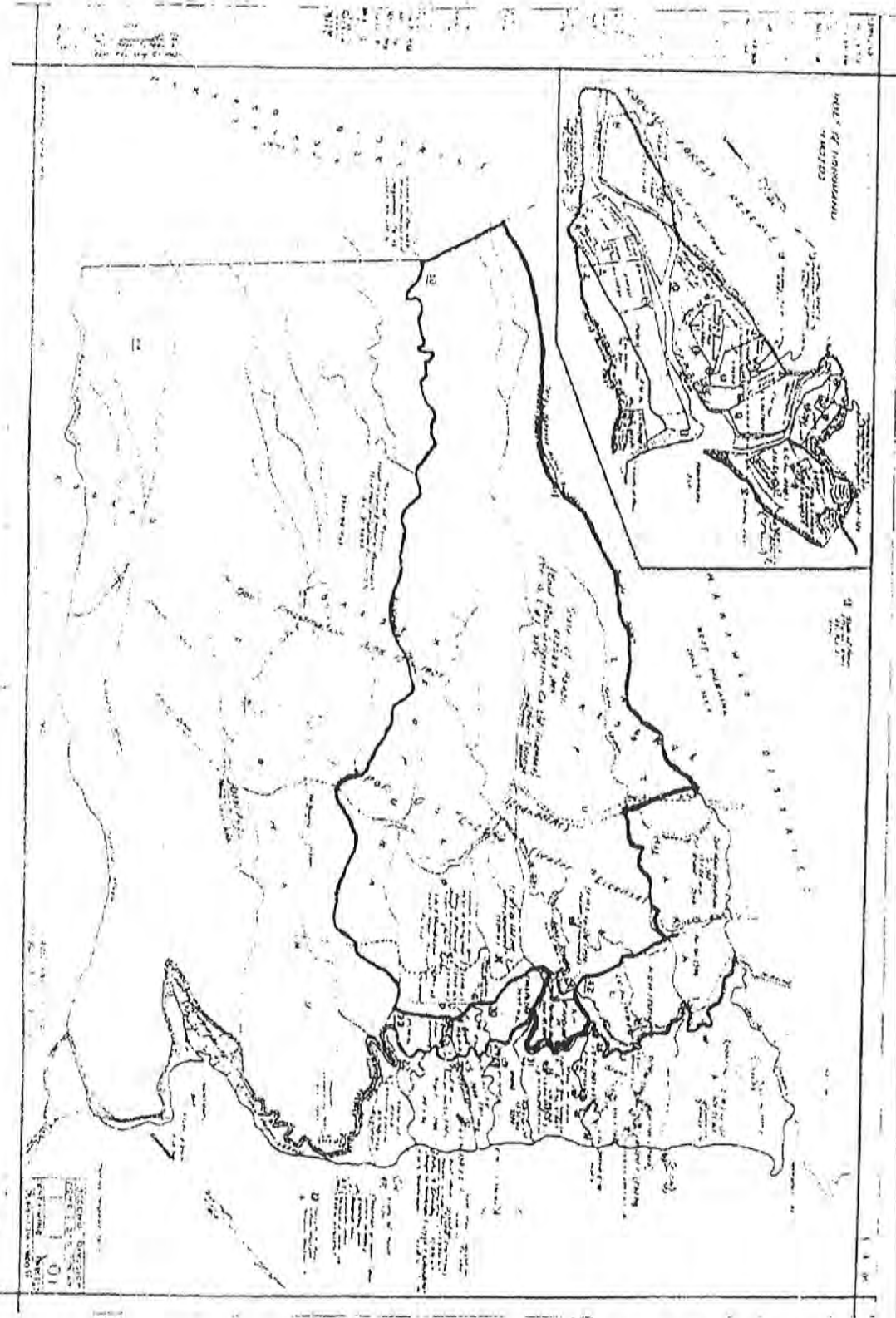


EXHIBIT B

"HUECO LICENSE"



MEMORANDUM OF UNDERSTANDING

THIS MEMORANDUM made as of the 31st day of December, 1973, by and between the BOARD OF WATER SUPPLY OF THE COUNTY OF MAUI, whose post office address is Kalana O Maui, Wailuku, Maui, Hawaii, hereinafter called BWS, and EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaii corporation, whose post office address is Paia, Maui, Hawaii, hereinafter called EMI, and HAWAIIAN COMMERCIAL AND SUGAR COMPANY, a division of Alexander & Baldwin, Inc., whose post office address is Puunene, Maui, Hawaii, hereinafter called HC&S.

Background. At the present time EMI is the holder of three general licenses from the State of Hawaii covering the following areas: License No. 3505 (Nahiku), which license expires on June 30, 1976, General License No. S-3695 (Honomanu), which license expires June 30, 1986, and General License No. 3578 (Huelo), which license expires June 30, 1981. EMI also has a revocable permit for the Keanae area with the State of Hawaii, pending an offering for a new license for public bid sometime in 1974. The approximate locations of the respective license areas are indicated in Exhibit A attached hereto. Further, EMI, HC&S and BWS have entered into an agreement (herein called the "1961 Agreement") whereby BWS has the right to collect water in areas owned or leased by EMI and HC&S in the Waiakamoi area and the Awalau Intake area, the approximate boundaries of which are indicated in black on Exhibit B.

In order to establish a constant and steady flow of water for the continued growth and progress of the Island of Maui, the parties have agreed to the following terms and

**EXHIBIT** E-122

conditions concerning the collection and delivery of water by EMI in the east Maui area with respect to the properties under license by EMI with the State of Hawaii and also on properties owned by EMI to be used by BWS for public water purposes in the Kula and Makawao and Nahiku water systems of BWS.

1. Nahiku. EMI will continue to collect and deliver to BWS at the rates provided herein up to 6,000 gallons of water per twenty-four hour day to serve the Nahiku community. The delivery point shall be the same point as presently used by EMI and BWS.

2. Waiakamoi and Awalau Areas. As of January 1, 1974, EMI will be appointed the exclusive manager to collect and deliver water in the area presently under license to BWS from EMI and HC&S, the approximate area of which is indicated in red on Exhibit B. Within that area EMI shall be responsible, at its expense, for the operation, maintenance, repair of the water collection and conveying facilities and the operation of the water storage and pumping facilities and shall collect at the highest elevation possible the maximum quantity of water that is economically feasible. EMI agrees at its expense and at its sole discretion to replace existing collection facilities or install additional collection facilities, or both, in order to improve the collection of water in this area. Any replacements to the existing collection facilities or any additional collection facilities installed by EMI shall belong to BWS upon completion of construction of each item.

Title to the existing water collection facilities installed by BWS shall remain with BWS. BWS shall be responsible for the maintenance of the storage facilities in this area

except that EMI shall perform minor maintenance on Puohokamoa dam and the three Waiakamoi dams. The portion of the system under the operational jurisdiction of BWS is colored in blue and under the operational jurisdiction of EMI is colored in red on the sketch attached hereto as Exhibit C.

EMI will at its expense from time to time and at all times during the term of this agreement, repair, maintain, amend and keep water collection facilities at any time during the term of this agreement existing within the collection area in good operational order and condition and will not allow unnecessary loss or waste of water.

Extensive and substantial damages to the collection and conveying and storage facilities owned by BWS as provided herein due to acts of God or events beyond the control of EMI requiring restoration or replacement of the facilities shall be the responsibility of BWS. Actual restoration and replacement of the existing facilities shall be subject to budgetary limitations of BWS which agrees to exercise reasonable judgment and good faith to include the costs, or portions thereof, of restoration and replacement in the ensuing budget or budgets. Actual restoration and replacement of additional facilities constructed by EMI shall be made at the discretion of BWS which decision shall be final and shall not be subject to arbitration.

At the end of the term of this agreement or sooner termination as provided herein, EMI shall surrender the collection and conveying facilities presently existing on the property together with any and all improvements or additional

facilities EMI may have installed to BWS in good operational order and condition, ordinary wear and tear or damages due to acts of God or beyond the control of EMI being excepted.

To the extent inconsistent with the terms of this agreement, the provisions of the agreement dated January 22, 1961, ("1961" Agreement") by and between the parties herein shall be cancelled and terminated by mutual agreement.

All water collected by EMI in the Waiakamoi and Awalau Intake areas shall be discharged into the following points:

Waiakamoi and Olinda Reservoirs  
Waiakamoi Pump  
Awalau Intake  
Piholo Reservoir

The parties shall, if necessary, execute a more definitive agreement outlining the duties and responsibilities of each party consistent with the terms of this agreement:

3. Wailoa Ditch. From the waters collected by EMI in the Wailoa Ditch System EMI will make available to BWS up to 12 million gallons of water per twenty-four hour period. An additional 4 million gallons of water per twenty-four hour period as needed by BWS will be made available by EMI to BWS upon one year's written notice to EMI.

Waters from the Wailoa Ditch shall be delivered to BWS at the following points presently used by EMI and BWS:

Huluhulunui, Lilikoi and Kamole Forebay.

4. Proportionate Reduction. If EMI is not successful in acquiring or holding the licenses mentioned hereinabove or in the event of a court ruling or the adoption of any governmental statute, ordinance, regulation or policy including but not limited to the withdrawal by the State of any lands under license or the condemnation of any lands under license, reducing the amount of water collected or

delivered by EMI or affecting the capability of FMI to collect or deliver water, then subject to and with the approval of the BWS by a vote of 2/3 of the members present, the amount of water to be delivered to BWS hereunder may be reduced proportionately; provided that in the event EMI is not successful in acquiring or holding the licenses mentioned hereinabove, then BWS will approve a proportionate reduction only (1) if the replacement State license included a provision wherein the licensee is required to make the proportionate amount of water available to BWS and (2) after a vote of 2/3 of the members present at a meeting duly called.

5. Due Diligence. EMI agrees to comply with the terms of the existing State licenses and to use due diligence to acquire replacement licenses as the present licenses, including the Keanae license, expire and replacement licenses for the same area containing substantially similar terms, other than the rent, are offered for bid by the State. BWS agrees to request the State Board of Land and Natural Resources to include a provision in any replacement license that the licensee make available to BWS amounts of water consistent with this agreement.

6. Additional Delivery Points. Additional delivery points may be added from time to time as mutually agreed between the parties. In the event the parties fail to agree and a party desires another delivery point to be added, then the same shall be determined by arbitration as provided herein.

7. Water Charges. BWS shall pay to EMI the sum of six cents per thousand gallons delivered by FMI to BWS from the Nahiku and Waiakamoi and Awalau Intake Systems and the Wailoa Ditch System. This rate shall remain fixed for the term of this agreement. After the lapse of fifteen (15) years of the term of this agreement, EMI may request for



an adjustment in the water charges due to increases in the cost to EMI of (1) payments to the State for water pursuant to the licenses mentioned herein; (2) fuel oil; (3) salaries and wages of EMI employees. BWS shall consider the request only after an affirmative vote of 2/3 of the members of the Board present at such meeting duly called agreeing to consider the request. In the event BWS should decide to consider the request by a vote of 2/3 of the members present, then BWS shall determine the request of EMI by a vote of 2/3 of the members present. The decision of BWS shall be final and shall not be subject to arbitration.

BWS shall install and maintain suitable meters or other measuring devices (hereinafter called meters) satisfactory to EMI for the purpose of measuring the total amount of water as provided herein. The meters shall be maintained within 2% accuracy and shall be tested every three years by BWS. Separate meters shall be installed by BWS to measure the water at any additional delivery point which may be required by EMI for a proper determination of the quantity of water being taken. Readings of the meters shall be taken and recorded by BWS at sufficient intervals so as to give a record in such form and degree of accuracy as shall be satisfactory to both parties. Reports of such readings shall be delivered by BWS to EMI at such intervals as shall be agreeable to the parties and EMI shall have the right at all times to inspect and make copies of the records of BWS and to make independent readings to verify all measurements taken by BWS. Where BWS operates a continuous water stage recorder which makes other water measurements within any of the sources listed above, copies of all the flow charts and/or records of individual water measurements shall be furnished to EMI.

BWS will pay the water charges herein mentioned in lawful currency of the United States at times and in the manner provided above to EMI or such other person or corporation as shall be designated by EMI in writing at least 10 days prior to the next ensuing payment.

8. Priority. BWS shall use insofar as practical all of the water collected in the Waiakamoi and Awalau Intake Systems prior to pumping water collected at Kamole Forebay. EMI shall give BWS priority in the use of water in fulfilling EMI's obligations set forth herein before any other private use.

9. Water Delivery. If the State of Hawaii requires in any replacement license to the licenses mentioned hereinabove that the licensee make available to BWS for public consumption and use certain portion of the water collected in the license area and the successful bidder is a person, partnership or corporation other than EMI or HC&S or any corporation affiliated with Alexander & Baldwin, Inc. and said licensee delivers said water to a convenient point of connection onto the Wailoa Ditch System, then EMI agrees to convey said water from the point of connection onto the Wailoa Ditch System to the points of delivery specified in this agreement to BWS free of any charge whatsoever.

10. Improvements to Wailoa Ditch System. EMI recognizes that improvements to the collection system for the Wailoa Ditch System may be necessary in order for EMI to provide the amount of water provided herein to BWS. EMI agrees that it shall at its expense make the necessary improvements as may be required. To the extent required by maintenance the parties recognize that portions of the Wailoa Ditch System may from time

to time be shut down for short periods of time. In such cases diversion of the water from one area to another may be necessary and each party shall cooperate with the other in order to permit the repair and maintenance of the Wailoa Ditch System.

11. Anti-Pollution. EMI agrees that it will use diligent efforts to prevent contamination or pollution of the water and that in the installation, maintenance and construction of collection facilities, and in the collection and delivery of water, it will in all cases comply with the rules and regulations of the Department of Land and Natural Resources, Department of Agriculture and the Department of Health of the State of Hawaii concerning the prevention of contamination or pollution. EMI shall not be otherwise responsible for the quality or potability of the water delivered to BWS according to the terms of this agreement.

12. Excuse of Performance. Anything in this agreement to the contrary notwithstanding, providing such cause is not due to the willful act or neglect of EMI, EMI shall not be deemed in default with respect to the performance of any of the terms, covenants and conditions of this agreement if same shall be due to any strike, lockout, civil commotion, war-like operation, invasion, rebellion, hostilities, military or usurped power, sabotage, governmental regulations or controls, inability to obtain any material, service, or financing, through act of God or other cause beyond the control of EMI.

13. Term. The term of this agreement shall be for twenty (20) years commencing January 1, 1974, and termi-

nating on December 31, 1993; provided, however, that this agreement may be extended from time to time by mutual agreement; provided further, that if any party decides not to extend the term of this agreement beyond December 31, 1993, then such party must give written notice of its decision to the other party prior to December 31, 1991; failure to provide such notice by December 31, 1991 shall extend, with the consent of the other party, this agreement for a period of two years if no notice is given by December 31, 1993, or if notice is given after December 31, 1991 but before December 31, 1993, then this agreement shall be extended, with the consent of the other party, for a period of two years from the date such notice was given.

14. Arbitration. Except as provided in paragraphs 2 and 7, if at any time during the term of this agreement or after the expiration or sooner determination thereof, any question, dispute, difference or disagreement shall arise between the parties hereto which cannot be adjusted or settled by them to their mutual satisfaction, then every such matter shall, at the desire of either party, be submitted to and be determined by three (3) arbitrators in the manner provided by Chapter 658 of the Hawaii Revised Statutes, as the same now is or may from time to time be amended, in which case either party may give to the other party written notice of its desire to have an arbitration of the matter in question and appoint one of the arbitrators in said notice, whereupon the other party, within ten (10) days after the receipt of such notice, shall appoint a second arbitrator and, in case of failure so to do, the party who has already appointed an arbitrator may have the second arbitrator appointed by a judge of the Circuit Court of the Second Judicial Circuit of the State of Hawaii, and the two arbitrators so appointed, in either manner, shall appoint

the third arbitrator, and in the event that the two arbitrators so appointed shall, within ten (10) days after the appointment of the second arbitrator, fail to appoint the third arbitrator, either party may have the third arbitrator appointed by said judge, and the three arbitrators so appointed shall thereupon proceed to determine the matter in question and the decision of any two of them shall be final, conclusive and binding upon the parties unless the same shall be vacated, modified or corrected as by said statute provided. The arbitrators shall have all the powers and duties prescribed by said statute and judgment may be entered upon such award by the said Circuit Court as provided by said statute and said judgment shall not be subject to appeal. Each of the parties shall pay its own expenses but the compensation and expenses of the arbitrators shall be borne equally by both parties.

15. Default. This agreement is upon the express condition that if any one or more of the following events of default shall occur, to wit:

a. BWS shall fail to pay the water rates herein reserved or any part thereof within thirty (30) days after the same become due, or

b. EMI shall fail to observe or perform any of the covenants herein contained and on the part of EMI to be observed and performed, and such failure shall continue for a period of sixty (60) days after written notice thereof given by BWS to EMI.

Then and in case of any such default EMI or BWS as the case may be, may, upon the occurrence of such event of default or at any time thereafter during the continuance

of such default, at its respective option, terminate this agreement by giving ten (10) days' written notice thereof to the defaulting party without resort to any legal process, all without prejudice to any other remedy or right of action which the other party may have for such default.

In addition the parties agree to enter into discussions for the purpose of entering into an alternate default provision in the event of default by EMI.

16. Acceptance of Water Rates Not Waiver. The acceptance of payment of water rates by EMI or its agents shall not be deemed to be a waiver by it of any breach by BWS of any covenant herein contained. The waiver by any party of any breach shall not operate to extinguish the covenant or condition, the breach whereof has been waived nor be deemed to be a waiver by such party of its right to terminate this agreement for any breach thereof.

17. Miscellaneous.

a. Definitions. The terms "party" and "parties" as used herein mean and include EMI, HC&S and the BWS.

b. Notices. Any notice or demand to be given to or served upon a party in connection with this agreement shall be deemed to have been sufficiently given or served for all purposes by being sent as registered mail, postage prepaid, addressed to such party at its post office address hereinbefore specified or at such other post office address as such party may from time to time designate in writing to the other party, or by being delivered personally to any officer of such party within the State of Hawaii, and any

such notice or demand shall be deemed conclusively to have been given or served on the date of such registration or personal delivery.

18. Successors and Assigns. All the terms, covenants, and conditions of this agreement shall inure to the benefit of and be binding upon the successors and assigns of all parties.

19. Private Contract. Nothing herein contained shall be construed as impressing this agreement with the character of a public service contract and no owner of any water privilege, domestic, commercial or otherwise, granted by BWS, shall have any right, title or interest in or to any of the water deliverable to BWS which shall be enforceable against or be binding upon EMI.

20. Rates Not Indicative. In the event of condemnation of any land or water rights in the areas covered by this agreement, the water rates contained in this agreement shall not be taken as indicative of the true value of the land or water rights, nor shall they be used for appraisal purposes on such taking.

21. Amendment. This agreement may be amended by mutual agreement in writing executed by both parties.

22. Consent. To the extent required by the above-mentioned State licenses the participation of EMI in this agreement is subject to the approval of the Board of Land and Natural Resources of the State of Hawaii.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed this 31<sup>st</sup> day of December, 1973, effective as of December 31, 1973.

BOARD OF WATER SUPPLY OF  
THE COUNTY OF MAUI

By David Kakuji  
Its

EAST MAUI IRRIGATION COMPANY,  
LIMITED

By Wilson S. Ham  
Its Vice - President

By D. M. Galt  
Its Vice President

ALEXANDER & BALDWIN, INC.

By Michael W. Weyher  
Its Executive Vice President

By Willis R. Deming  
Its Secretary



STATE OF HAWAII        )  
                              ) ss.  
COUNTY OF MAUI        )

On this 31<sup>st</sup> day of DECEMBER, 1973,  
before me appeared DAVID NOBRIGA, to me  
personally known, who, being by me duly sworn, did say  
that he is the Chairman of the BOARD OF WATER SUPPLY OF  
THE COUNTY OF MAUI, and that the seal affixed to the  
foregoing instrument is the seal of said Board of Water  
Supply and that the instrument was signed and sealed in  
behalf of said Board of Water Supply by authority of  
the said Board, and said DAVID NOBRIGA  
acknowledged the instrument to be the free act and deed  
of said Board of Water Supply.

Flourence Iles  
NOTARY PUBLIC, Second Judicial  
Circuit, State of Hawaii.  
My commission expires: 2/9/75.

STATE OF HAWAII        )  
                              ) ss.  
COUNTY OF MAUI        )

On this 31<sup>st</sup> day of December, 1973,  
before me appeared William S Haines and  
Phil Scott, to me personally known, who,  
being by me duly sworn, did say that they are the  
Vice President and Vice President,  
respectively, of EAST MAUI IRRIGATION COMPANY, LIMITED, a  
Hawaii corporation; that the seal affixed to the foregoing  
instrument is the corporate seal of said corporation; that  
said instrument was signed and sealed in behalf of said  
corporation by authority of its Board of Directors and  
said Officers acknowledged said instrument to be the free  
act and deed of said corporation.

Kenneth K. Kahan  
NOTARY PUBLIC, Second Judicial  
Circuit, State of Hawaii.  
My commission expires: 1/15/75

STATE OF HAWAII )  
CITY AND COUNTY OF HONOLULU ) ss.

On this 31<sup>st</sup> day of December, 1973.

before me appeared Michael Ulyshen and  
Willis R. Deming, to me personally known, who,  
being by me duly sworn, did say that they are the

Executive Vice President and Vice President Secretary, <sup>pk</sup>  
respectively, of ALEXANDER & BALDWIN, INC., a Hawaii cor-  
poration; that the seal affixed to the foregoing instrument  
is the corporate seal of said corporation; that said instru-  
ment was signed and sealed in behalf of said corporation  
by authority of its Board of Directors and said Officers  
acknowledged said instrument to be the free act and deed  
of said corporation.

Patricia M. Tono  
NOTARY PUBLIC, First Judicial  
Circuit, State of Hawaii.

My commission expires: 10/1/76

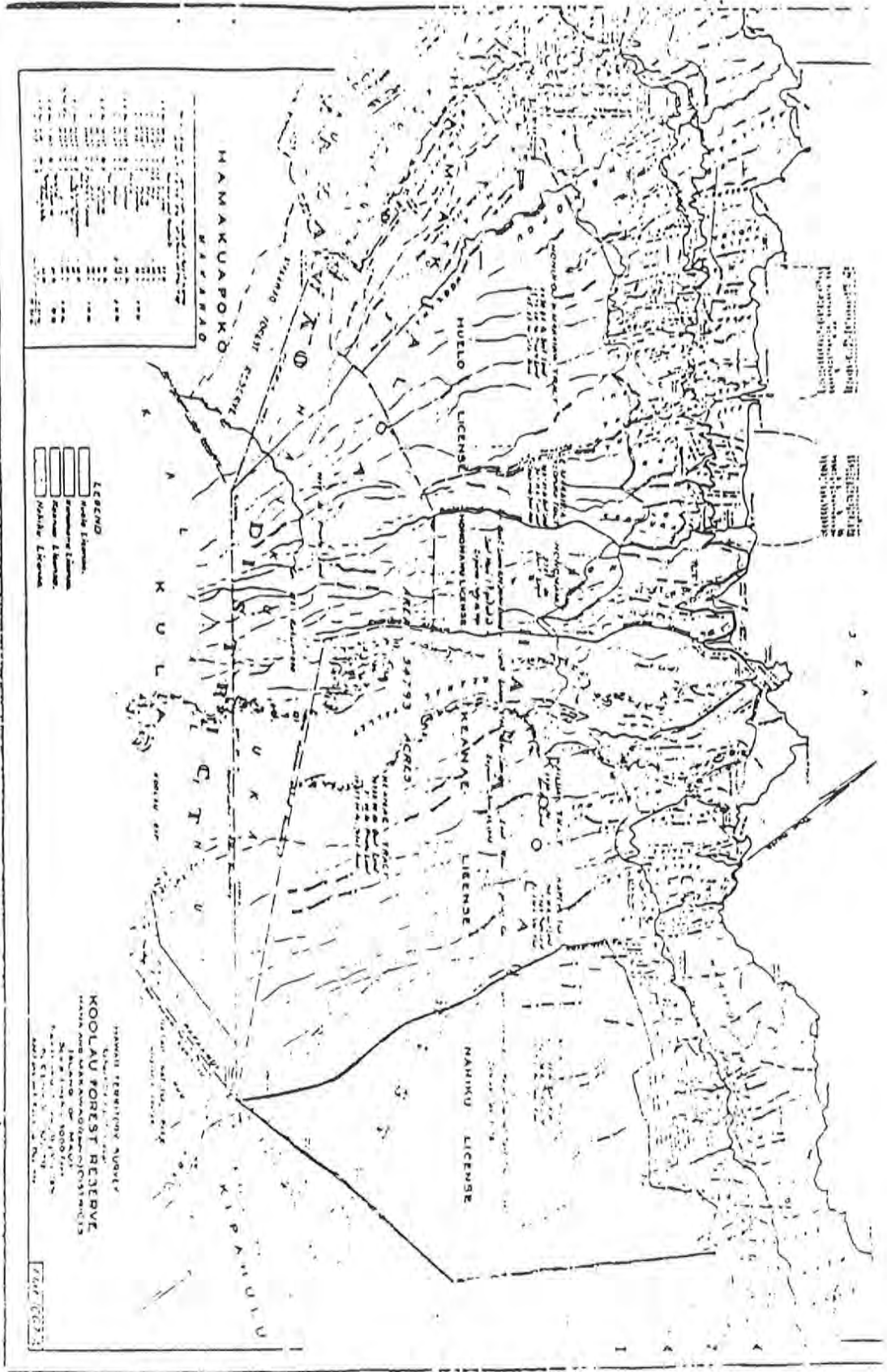


EXHIBIT A



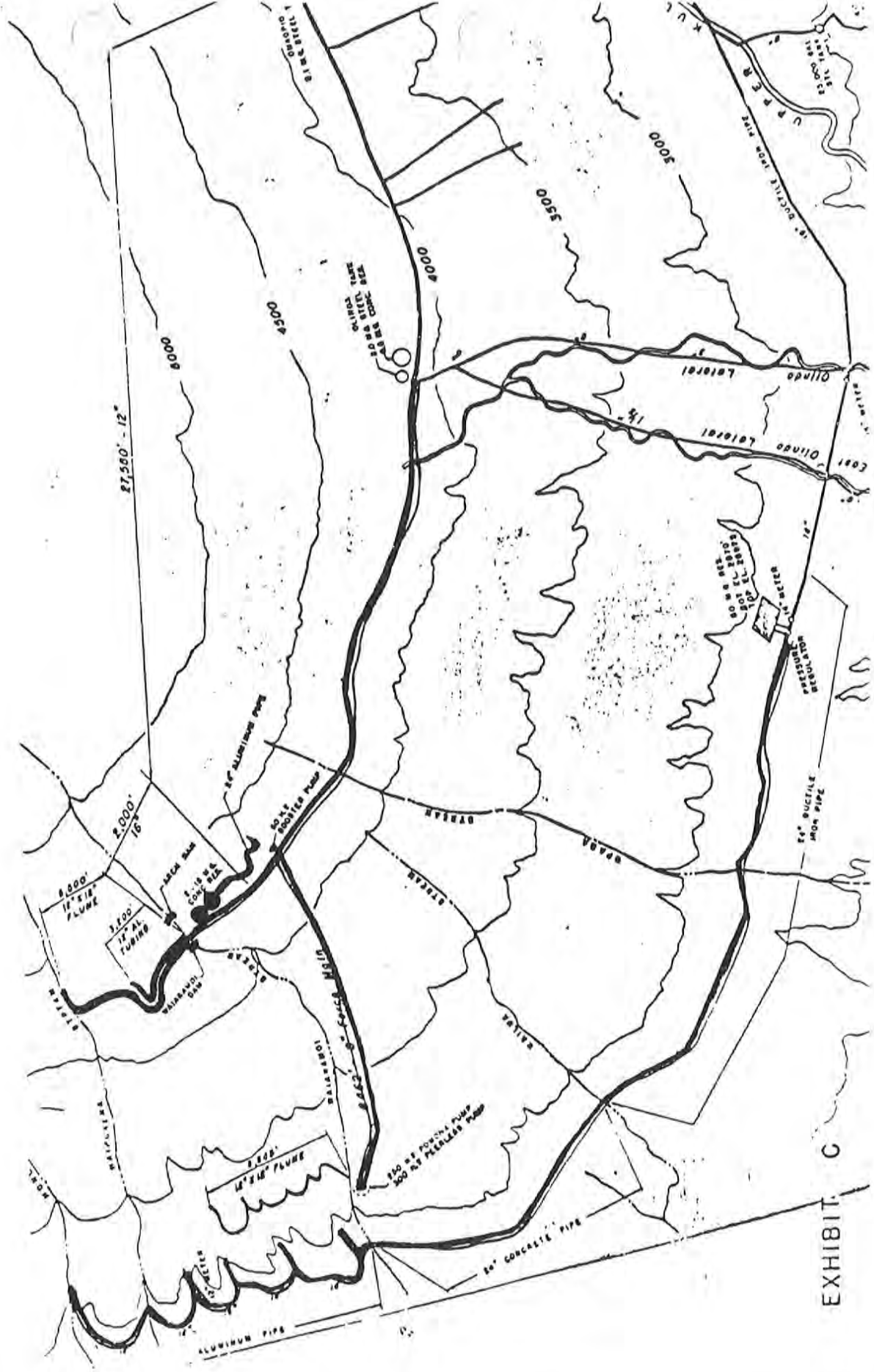


EXHIBIT C

## CERTIFICATE OF SERVICE

I hereby certify that one copy of the foregoing document was duly served upon the parties listed below by email, on December 30, 2014.

Commission on Water Resource Management  
(via U.S. Mail and email  
c/o kathy.s.yoda@hawaii.gov)  
c/o Kathy S. Yoda  
P.O. Box 621  
Honolulu, HI 96809

Lawrence Miike, Hearings Officer  
(via email: [lhmiike@hawaii.rr.com](mailto:lhmiike@hawaii.rr.com))  
c/o Commission on Water Resource  
Management  
P.O. Box 621  
Honolulu, HI 96809

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(via email: [Caleb.Rowe@co.maui.hi.us](mailto:Caleb.Rowe@co.maui.hi.us))  
Kristin Tarnstrom, Esq.  
(via email: [Kristin.Tarnstrom@co.maui.hi.us](mailto:Kristin.Tarnstrom@co.maui.hi.us))  
Department of the Corporation Counsel  
County of Maui, 200 S. High Street  
Wailuku, HI 96793  
Attorneys for County Dept of Water Supply

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Linda L.W. Chow, Esq.  
(via email: [linda.l.chow@hawaii.gov](mailto:linda.l.chow@hawaii.gov))  
Department of the Attorney General  
465 South King Street, Room 300  
Honolulu, HI 96813

DATED: Wailuku, Maui, Hawaii

12.30.14

  
Isaac Hall

Attorney for Maui Tomorrow Foundation, Inc., and its Supporters