

JOHN WAIHEE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF LAND MANAGEMENT  
P. O. BOX 621  
HONOLULU, HAWAII 96809

AQUACULTURE DEVELOPMENT PROGRAM  
AQUATIC RESOURCES CONSERVATION AND ENVIRONMENTAL AFFAIRS  
CONSERVATION AND RESOURCES ENFORCEMENT  
CONVEYANCES FORESTRY AND WILDLIFE  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT  
'92 JAN 17 A8:16

January 15, 1992

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

Mr. Brian Choy, Director  
Office of Environmental Quality Control  
465 South King Street, Room 115  
Honolulu, HI 96813

Dear Mr. Choy:

Subject: Environmental Assessment for Royal Vista Estates and Country Club for the Direct Sale of Remnants at Puuanahulu Homesteads, North Kona, Hawaii

Copies of the above-cited assessment were forwarded for our review and comments. The assessment is identified as follows:

Applicant: ROYAL VISTA ESTATES AND COUNTRY CLUB

Direct sale of remnants situate at Puuanahulu Homesteads, North Kona, Hawaii, further identified by Tax Map Key:3rd/7-1-05:Homestead Roads

As owner of the underlying lands, we have, as requested, reviewed said assessment. Please be advised that on the basis of the assessment, we find that the proposal will have no adverse impact on the environment.

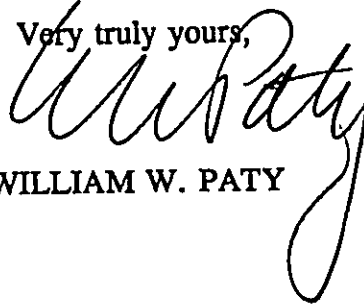
This constitutes our filing a Negative Declaration for the above-cited project.

Please find enclosed for your consideration and action four (4) copies of the Environmental Assessments together with maps.

Mr. Brian Choy  
Page 2

For any questions to the foregoing, please contact our Land Management Division at  
587-0414, or our Hawaii District Land Office at 933-4245.

Very truly yours,



WILLIAM W. PATY

Encls.

cc: Hawaii Land Board Member  
Land Management Administrator  
Hawaii District Land Office

1992-02-08-HI-PEA-Royal Vista Estates & Country Club

2-8-92

**ENVIRONMENTAL ASSESSMENT**  
**FOR THE DISPOSITION OF STATE HOMESTEAD ROAD**  
**PUUANAHULU, NORTH KONA, HAWAII**  
**TAX MAP KEYS: 7-1-05: 9, 10, 26, 28-34, 39-41, 58, and 59**

**PREPARED FOR:**  
**ROYAL VISTA ESTATES AND COUNTRY CLUB**  
**PREPARED BY:**  
**SIDNEY FUKU AND ASSOCIATES**

**APRIL 1990**

I. SUMMARY

CHAPTER 343, HRS  
ENVIRONMENTAL ASSESSMENT

**ACTION:** Applicant

**PROJECT NAME:** Royal Vista Estates and Country Club

**PROJECT DESCRIPTION:** The applicant proposes to acquire certain State roadways fronting the applicant's properties. A golf course would be constructed, and the existing lots would be further subdivided and reconfigured. A new road, constructed to County dedicable standards, would serve as access to the golf course and newly created and reconfigured lots.

**AREA:** The subject parcels consist of 413+ acres of land. The area of the proposed acquisition consists of approximately 13,000 lineal feet of road. Said road averages a right-of-way width of about 40 feet. Hence, the proposed land area involves 12+ acres of land.

**PROJECT LOCATION:** The subject area is located along the northwest (makai) side of the Mamalahoa Highway and across of the Puu Lani Ranch Subdivision, Puuanahulu Homesteads, North Kona.

**PRESENT USE:** While the land adjoining the State road is currently used for pastoral activities, the road itself is unimproved and undelineated. It is in fact a "paper" road.

**STATE LAND USE:** Agriculture

**GENERAL PLAN:** Intensive and Extensive  
Agriculture

**DEVELOPMENT PLAN:** The Kona Regional Plan does  
not extend to this section of  
Kona. Hence, there is no  
designation.

**ZONING:** Unplanned

**PROPOSING APPLICANT:** Premier Resorts Development,  
Inc.

**LANDOWNER:** State of Hawaii

**ACCEPTING AUTHORITY:** Department/Board of Land  
and Natural Resources  
State of Hawaii  
P. O. Box 621  
Honolulu, HI 96809

**CONSULTING AGENCIES:** Planning Department  
Public Works Department  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Department of Transportation  
State of Hawaii  
50 Makaala Street  
Hilo, Hawaii 96720

Department of Land and Natural  
Resources, Division of  
Forestry and Wildlife  
State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

US Department of Interior  
Fish and Wildlife Service  
P. O. Box 50167  
Honolulu, Hawaii 96850

II. PROJECT BACKGROUND

A. Project Location

The subject project is located along the northwest (makai) side of the Mamalahoa Highway and generally across of the Puu Lani Ranch Subdivision, Puuanahulu Homesteads, North Kona, TMK: 7-1-05: 9, 10, 26, 28-34, 39-41, 58 and 59. (See Exhibit A). The site is bounded on the mauka side by the Mamalahoa Highway, and the other three surrounding boundaries are vacant State-owned parcels.

There are a number of privately-owned parcels within the subject area. These parcels are used for pastoral purposes.

These parcels abut an unimproved, "paper" road which is the subject of this petition. The paper road is approximately 40 feet wide and extends over a distance of about 13,000 feet or about 2.5+ miles. A copy of the approximate tax map depicting the requested roadway is attached as Exhibit B.

As the affected properties are singularly owned and used for grazing, there has been little or no use of this "paper" road.

While there are some residences in the general area, none of them gain access from the requested section of the subject State road.

B. Project Description

The subject area consists of 15 lots covering approximately 413+ acres. All of these lots have legal access via this "paper" State homestead road.

The "paper" road presently has an approximate right-of-way width of 40 feet. The length of this road that is being proposed to be acquired is about 13,000 lineal feet or about 2.5+ miles. The area of this roadway is about 12+ acres.

The area covered by these 15 lots will be developed into a 27-hole private golf course and related facilities. Also proposed are 30 to 40 5+ acre lots. A copy of the proposed development plan is attached as Exhibit B.

It should also be noted that the number of lots within the subject area may increase to 70 to 80 lots. To effectuate this additional number of lots, however, a zone change must be approved by the County Council.

If the proposed development plan is implemented, all of the resultant lots and golf course will have access via a County standard road. Thus, the proposed action to acquire the road will not result in the loss of any legal and practical accesses to the resultant lots and land uses.

**C. Project Timetable**

The applicant hopes to begin construction immediately upon securing all necessary governmental approvals. Should the subject application be approved, then, appropriate plans will be prepared reflecting the use and subsequent re-arrangement of the roadway. Then the grading plans for the golf course will be submitted.

Hopefully, construction can begin by mid 1990 and completed within a year thereafter.

It should also be noted that the start of the golf course construction and this (acquisition of the State road) is not predicated upon any increase in density. That is a separate process and not particularly pertinent (from a construction and access perspective) to the subject request.

**D. Project Funding**

The total golf course and related development is planned to be funded and developed by the applicant and possible joint venture partners. The estimated cost of the

golf course and related improvements is \$35 million in 1989 dollars.

III. RELATIONSHIP OF THE PROPOSED ACTION TO STATE AND COUNTY LAND USE POLICIES

A. State Land Use Law

The area of the requested acquisition is located within the State Land Use Agricultural District. As the properties are not classified "A" or "B" on the Land Study Bureau maps, golf course uses are permitted. Hence, no State Land Use Commission action is required for the proposed development.

B. County General Plan

The County General Plan Land Use Pattern Allocation Guide Map designates the subject properties Extensive and Intensive Agriculture. Lands designated Intensive Agriculture have relatively fertile soil and are basically used for sugar, orchard, diversified agriculture, and floriculture. Extensive Agriculture refers to pasturage and range lands.

C. County Zoning

The subject site is zoned Unplanned. Five acre lots are permissible in this zone. Furthermore, a golf course is allowed, provided that a Use Permit is issued by the Planning Commission. Such a permit was issued by the Commission on March 1, 1990. (See Exhibit D).

To effectuate the proposed relocation of this roadway, a subdivision application must be reviewed and approved by the County. The applicant intends to submit such an application should the Land Board approve the road acquisition request.

D. Special Management Area

The property does not fall within the County Special Management Area (SMA). As such, a SMA Use Permit is not required.



**E. Other County Permits**

As noted earlier, a subdivision application for the consolidation and resubdivision of the affected lots and roadway still has to be processed and approved by the County. This will occur subsequent to the Land Board action on the pending request.

Additionally, a grading permit is required for the golf course, as well as Plan Approval for the proposed clubhouse and related facilities. These applications will be filed after the disposition of the pending request.

**IV. DESCRIPTION OF AFFECTED ENVIRONMENT**

As it is difficult to isolate the actual conditions of the roadway itself, all of the subsequent discussions will involve the general area, of which the roadway is a part.

**A. Existing Land Use**

The road or the area covered by this application is unimproved. It is for all intents and purposes a "paper" road. The parcels adjoining this road are used for pasturage activities. This road, thus, is functionally used as part of the pasture. There is no fence and/or other physical barrier that separates this road from the adjoining parcels.

Corn was grown on portions of the subject area in the early 1900's largely for cattle feed. Its current use, however, is pasturage.

**B. Soil and Topographic Characteristics**

The USDA Soil Conservation Service's Soil Survey Report identifies the majority of this area to be of the Puu Pa series (PWD and PVF3). This series consists of well-drained, stony, very fine sandy loams that formed in volcanic ash. Generally, Puu Pa soils are used for pasture.

The PVF3 soil is somewhat eroded in most areas, with a thin soil layer. The hazard of erosion is very severe; runoff is rapid; and the average slope is about 90 percent.

The PWD has an average slope of about 13 percent. Runoff is medium, and the erosion hazard is moderate.

The overall site also includes Rock Land (rRO) which is a miscellaneous land type consisting of pahoehoe lava bedrock with intermittent layer of thin soil material. The dominant slope is about 10 to 15 percent.

The Land Study Bureau's master productivity rating for agricultural use of the overall site is Class "D" (Poor) and "E" (Very Poor).

Under the State Department of Agriculture's Agricultural Lands Of Importance to the State of Hawaii (ALISH) system, about 60% of the entire area is designated "Other Important Agricultural Land". The balance of the area is not classified.

#### C. Flora

A floral survey was conducted by Char and Associates (see Exhibit E). The survey noted that the overall site is dominated by introduced forage species, mostly the kikuyu and Rhodes grass. The tree species found scattered throughout the site included the eucalyptus, black wattle, and silk oak.

The report also noted that "No officially listed threatened and endangered species, protected by Federal and/or State endangered species law, were found on the site; nor did we encounter any plants proposed or candidate for such status."

The report concluded that "There are no botanical reasons to impose any restrictions, impediments or conditions to the development of this site."

D. Fauna

A faunal survey of the entire area was conducted by Dr. Phil Bruner (Exhibit F). Based upon his survey, Dr. Bruner made, among others, the following general conclusions:

1. "The present habitat provides a limited range of living spaces which are utilized by the typical array of exotic species of birds one would expect at this elevation and in this type of environment in Hawaii."
2. Three endemic species were recorded, species which are reasonably common on Hawaii. These included the Hawaiian Hawk or 'Io, Amakihi, and Apapane. The Hawaiian Goose or Nene has been observed in the surrounding area but not observed on this site during the survey period.
3. The site does not offer anything unusual or unique for these birds. There are abundant similar habitats in the North Kona and South Kohala region.
4. While the proposed development will alter existing habits, it will create an environment suitable to a more limited array of birds.
5. "Pesticides and herbicides typically used in golf course operations potentially present problems for foraging birds. I would recommend that appropriate government agencies be consulted as to which pesticides and herbicides may be used 'safely'."

Responses to this survey were also received from the State Department of Land and Natural Resources and US Fish and Wildlife Service. Their comments are attached as Exhibit G and H, respectively.

The US Fish and Wildlife Service noted that golf courses and pastures could become important habitats for the recovery of Nene. Thus, certain recommendations were offered relative to the design and management of the golf course.

The Forestry Division of the State Department of Land and Natural Resources also had similar types of comments. Additionally, it raised a concern of pesticide/herbicide impacts to the adjoining State lands. ]

The applicant intends to comply with the recommendations of those agencies, as well as the faunal consultant.

**E. Drainage**

The U.S. Corps of Engineers Flood Insurance Rate Map (FIRM) designates the area as Zone "X" or "area outside of the 500-year flood plain". As a result, no major flood or flood related impacts are anticipated.

**F. Archaeological**

An archaeological reconnaissance survey was performed of the subject site by Paul Rosendahl, Phd., Inc. A copy of this survey is attached as Exhibit I.

Eleven (11) sites were identified, consisting of terrace rock mounds enclosure, boulder alignments, modified outcrop, box C-shape, cistern, and possible cultural deposit. Four (4) of the eleven (11) sites were assessed as significant solely for scientific information content, and further data collection was recommended. Four (4) of the remaining seven (7) sites were assessed as culturally significant and valuable for information content.

Essentially, the survey report concluded that a data recovery plan be prepared, and that further data collection be taken before a decision to preserve "as is" is made on some of

the sites.

It should also be noted that there were three family cemeteries within the subject area. The applicant has agreed to preserve those burials as well as to provide access easements to these areas. A copy of such a letter of agreement and public representation is attached as Exhibit J.

**G. Water**

Potable water for the clubhouse and related activities, as well as the proposed lots, will be secured from an existing private water company, Puuwaawaa Water Works, Inc.

Water for the golf course will be secured from a private well(s) to be dug either on-site or off-site on private lands.

**H. Traffic**

Mamalahoa Highway fronts the subject site. This Highway has a right-of-way width of 50 feet, with a 24-foot wide pavement. The access point from the Highway to the proposed golf course has not been firmly established. This will be done in conjunction with the review of the community and subsequent approval of appropriate State and County agencies.

A Traffic Impact Analysis Report, prepared for this project, is reflected as Exhibit K. Said report concluded that the "proposed project is not expected to have a significant traffic impact on the local roadway system. A single-lane access road and simple intersection with the Mamalahoa Highway will be sufficient to meet the forecast traffic volumes."

Notwithstanding that conclusion, the applicant has agreed to construct a channelized intersection. This was also made a condition of approval by the Planning Commission. A copy of the Commission's approval, with conditions, is attached as Exhibit D.

The principal access within the project site will have a 60-foot right-of-way width County standard road. While it is the applicant's intent to keep this road private, the public will be allowed to use it to secure accesses to surrounding State lands. This was also made a condition of approval by the Planning Commission, as noted in Exhibit D.

**I. Wastewater**

The applicant intends to use septic tanks as a means of wastewater disposal. Should an alternate system be required by the appropriate State and/or County agencies, the alternate system will be constructed.

**J. Other Utilities**

Electrical and telephone services are available in this area.

Police, fire, and other major government services are found in Kailua-Kona and Kamuela, approximately 30 miles to the south and north, respectively.

It should be noted that the applicant intends to retain a private security firm. As may be needed, helicopter services for emergency use is also being contemplated.

**K. Socio-Economic**

The socio-economic impact of the acquisition of the road itself is not overly significant; however, when taken in the context of its relationship to the ultimate project, the impact takes on a different dimension.

As noted earlier, the project is a 27-hole golf course with a number of lots rimming the course. The existing paper road is proposed to be acquired, and subsequently new roads would be constructed, consistent with the layout of the golf course and lots.

The area of the project is located in a relatively small rural community called Puuanahulu. There are a number of homestead lots situated adjacent and on the mauka side of the subject site. The Puu Lani Ranch Subdivision is also situated mauka of the project area and the Mamalahoa Highway. The lands bordering the site's north, west, and east property lines are owned by the State of Hawaii and zoned Unplanned by the County. The Puuwaawaa Ranch is located in the immediate area.

A number of residents work in areas outside of Puuanahulu. Some of the other residents are retirees.

As the proposed development would have the most immediate impacts to the surrounding community, a number of community meetings were held by the applicant. Issues such as potential for higher taxes, golf course users, archaeological features, native birds, jobs, and so forth were raised. The applicant attempted to address all of them.

Based upon those concerns, a number of representations were made and committed by the developer. These commitments related to the assistance in tax deduction forms, water subsidies, job preferences, and a number of other considerations. These are contained in a letter to the Planning Director, a copy of which is attached as Exhibit J.

Many area residents and/or landowners also supported the project, and signed a petition of support. A copy of this petition is attached as Exhibit L.

While there will be socio-economic impacts, the applicant has attempted to mitigate them.

V. ALTERNATIVES TO THE PROPOSED ACTION

The applicant believes that the proposed plan to acquire and realign the road will not result in

a more deleterious situation than what presently exists. The existing roads are "paper" and effectively non-existent. With its realignment, access to surrounding State properties would become more of a reality. Furthermore, physical access to the number of existing lots would be possible.

Furthermore, its realignment would be done in a manner consistent with appropriate County standards for road and related improvements. Then, too, there would not be any significantly adverse impacts to the physical and natural environment. All appropriate technical studies were conducted, and mitigative recommendations offered by the consultants and government agencies will be adhered to.

Alternatives have been examined in arriving at this conclusion, including the following:

**A. No Action**

No action would mean that the proposed development would have to be built around the existing paper road. This means that the main entry point at the Mamalahoa Highway would have to be fixed; and that may not necessarily be the most prudent location. The realignment of the paper road would afford an opportunity to establish an intersection at the Mamalahoa Highway that best meets current State and County standards for sight distance and related road improvements.

Furthermore, as the existing road is a "paper" one, there is no practical access to the surrounding State-owned parcels. With the realignment and subsequent improvements, the public would have a greater opportunity to secure access to State-owned lands.

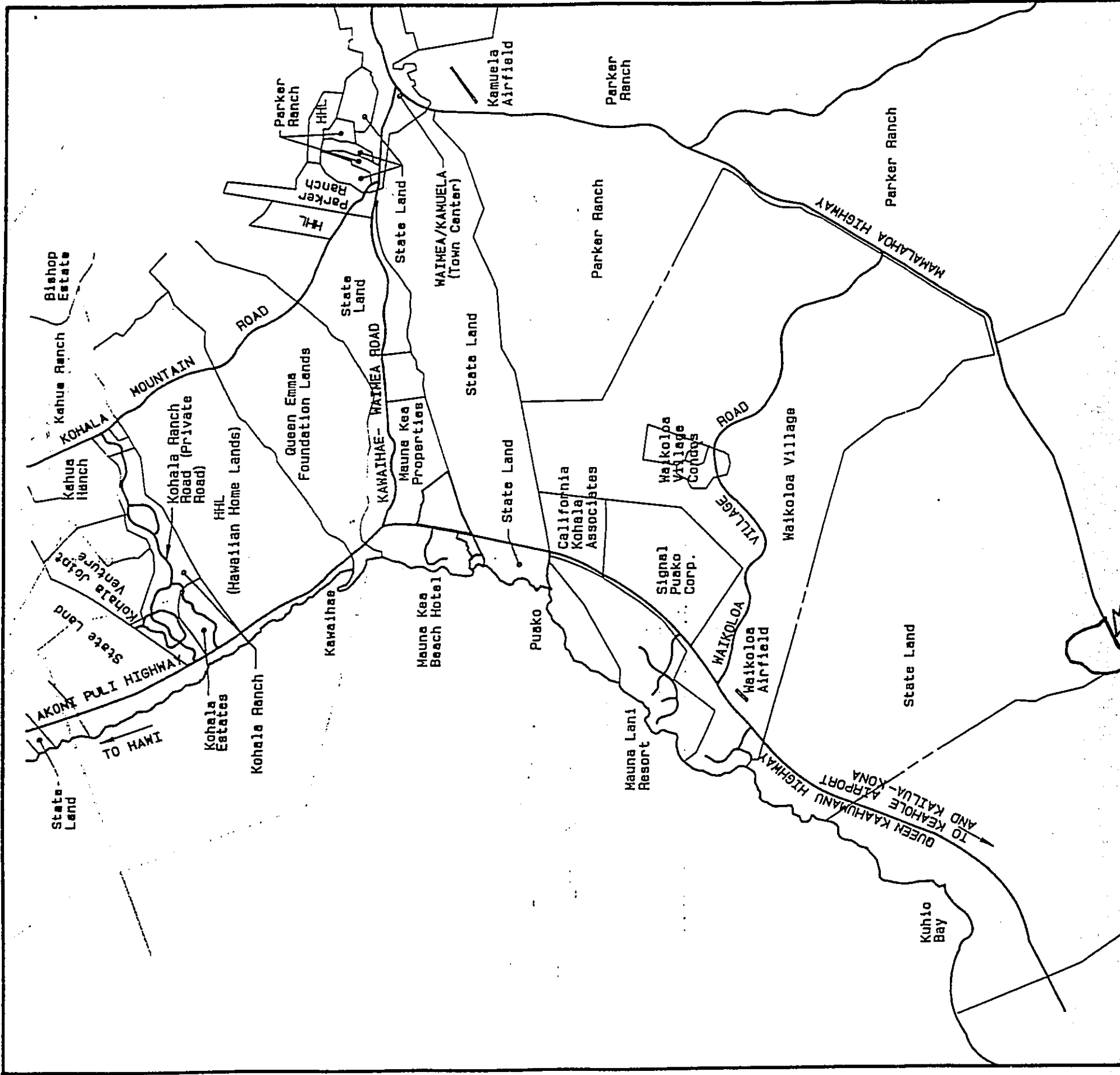
**B. Alternate Use**

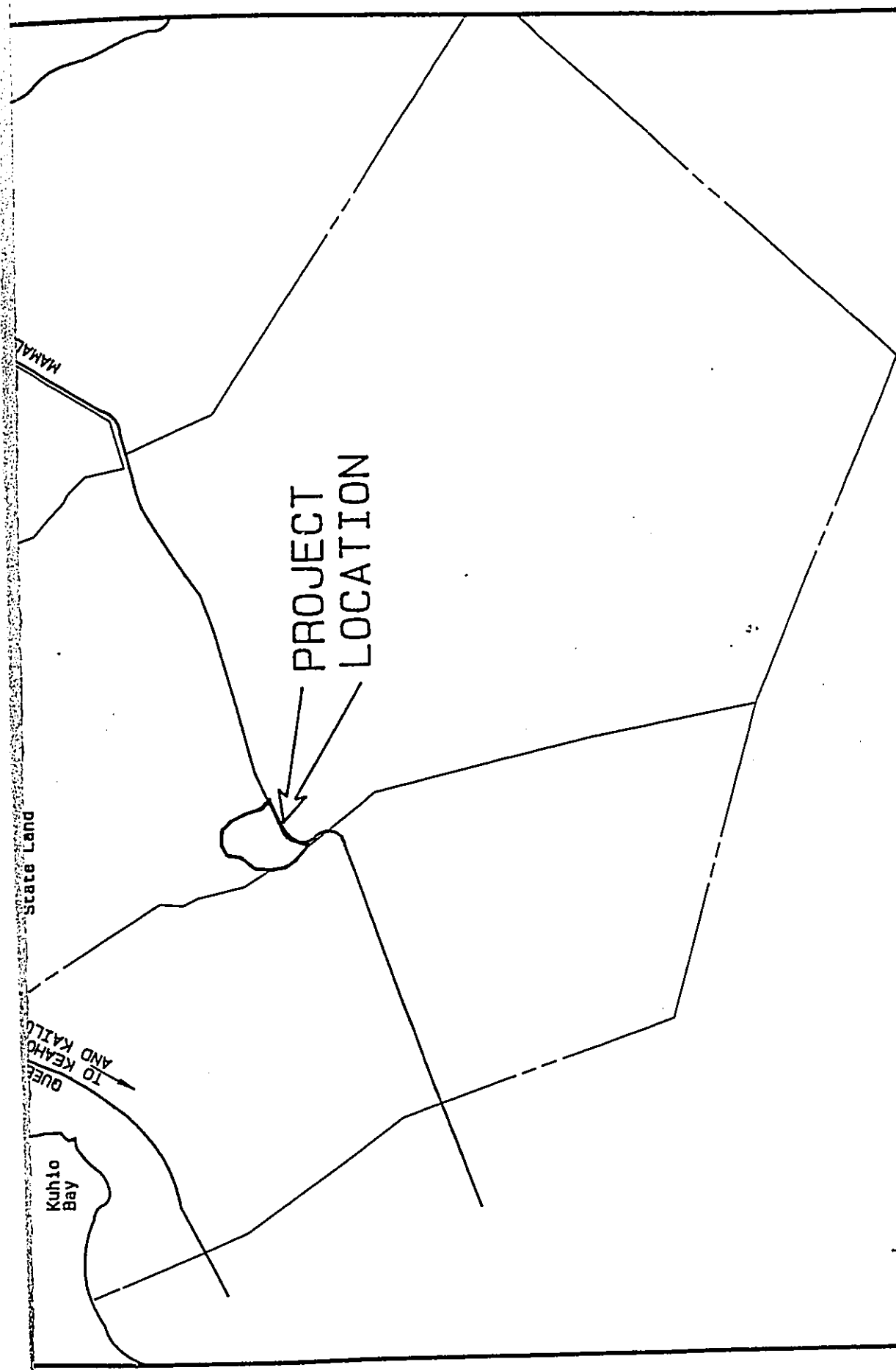
An alternative could be to have this paper road conveyed to the adjoining property owners for their personal use and/or plans. In that regard, since the adjoining property owner(s) and the applicant are the same, the intended



purpose of this request would still be fulfilled.

Another alternative could be for the State to improve this road to serve as access to its properties. This could possibly mean, however, that additional rights-of-way would have to be secured from the adjoining property owner (in this case, the applicant) to make the road a fully County standard road.





# ROYAL VISTA ESTATES AND COUNTRY CLUB

27 HOLE GOLF COURSE AND GOLF ACADEMY



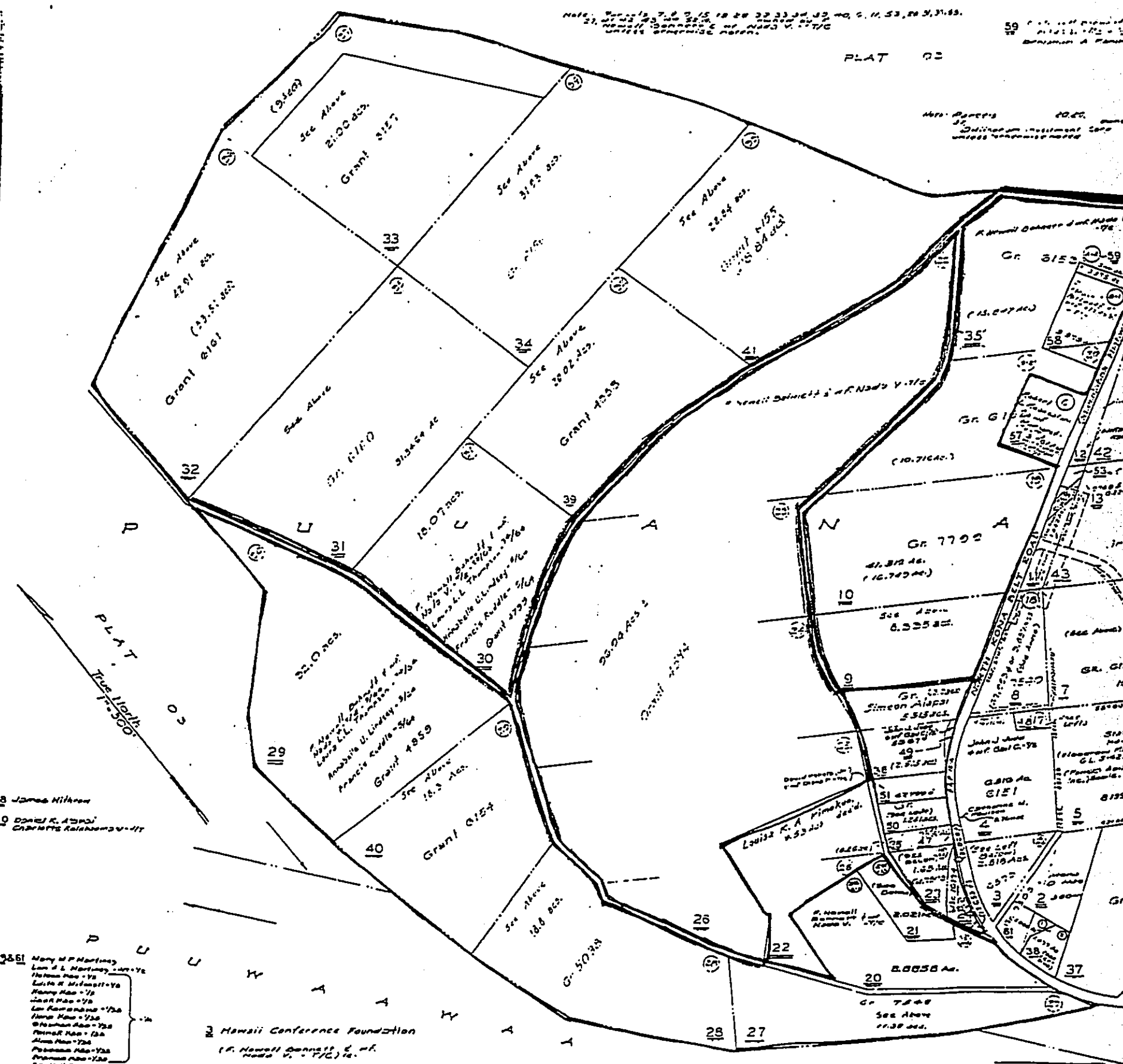
SCALE IN MILES

EXHIBIT A

NOTE: Sections 7, 8, 9, 15, 18, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

PLAT 02

Map of Property 20.00 Acres  
35' Right of Way  
Unless Otherwise Noted



3 1456  
PUJANAHULU HMSTDS, N. KONA, HAWAII

21 William J. ...  
22 ...  
23 ...

- 48 James Nihron
- 50 David K. ...
- 51 Mary of ...
- 52 ...
- 53 ...
- 54 ...
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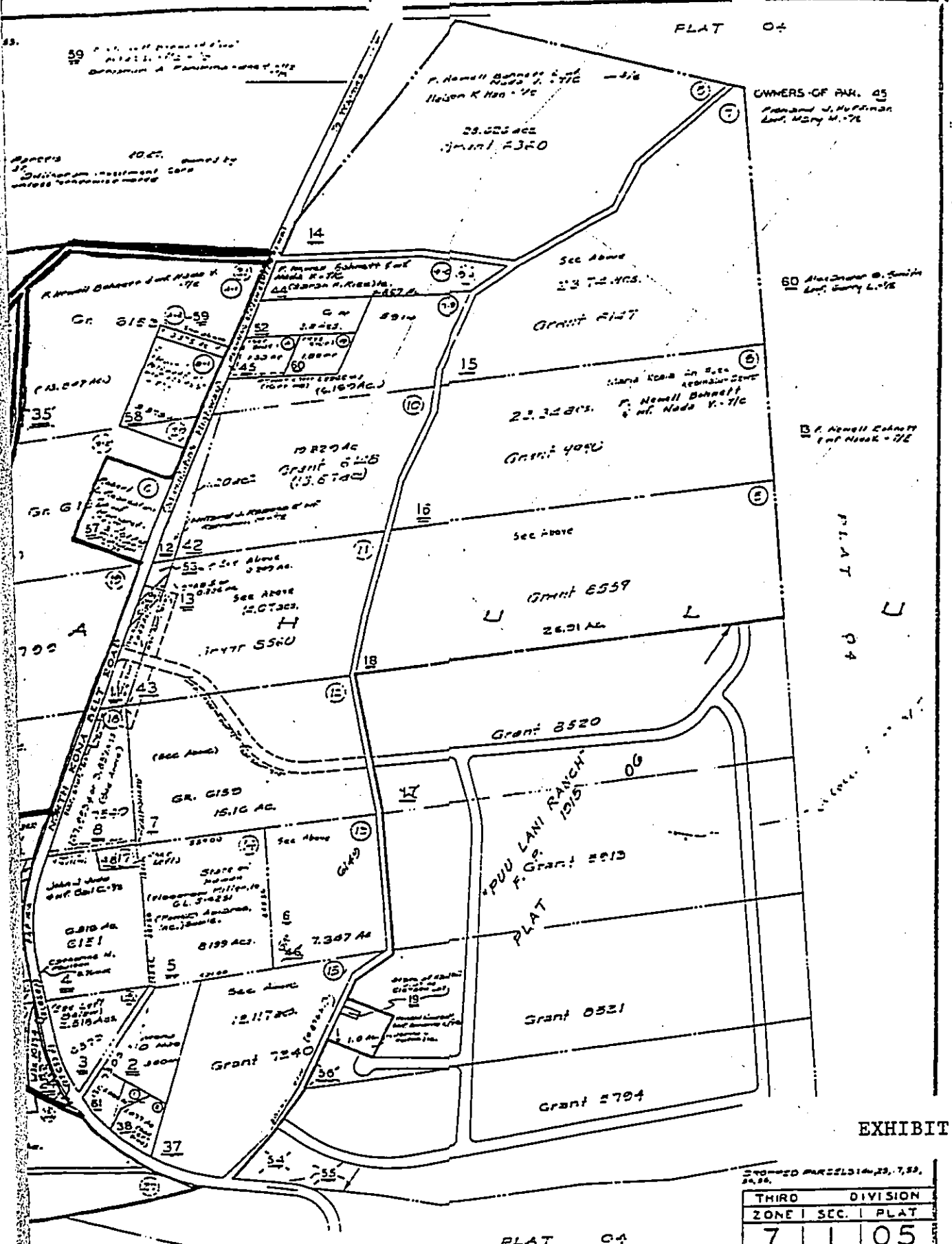


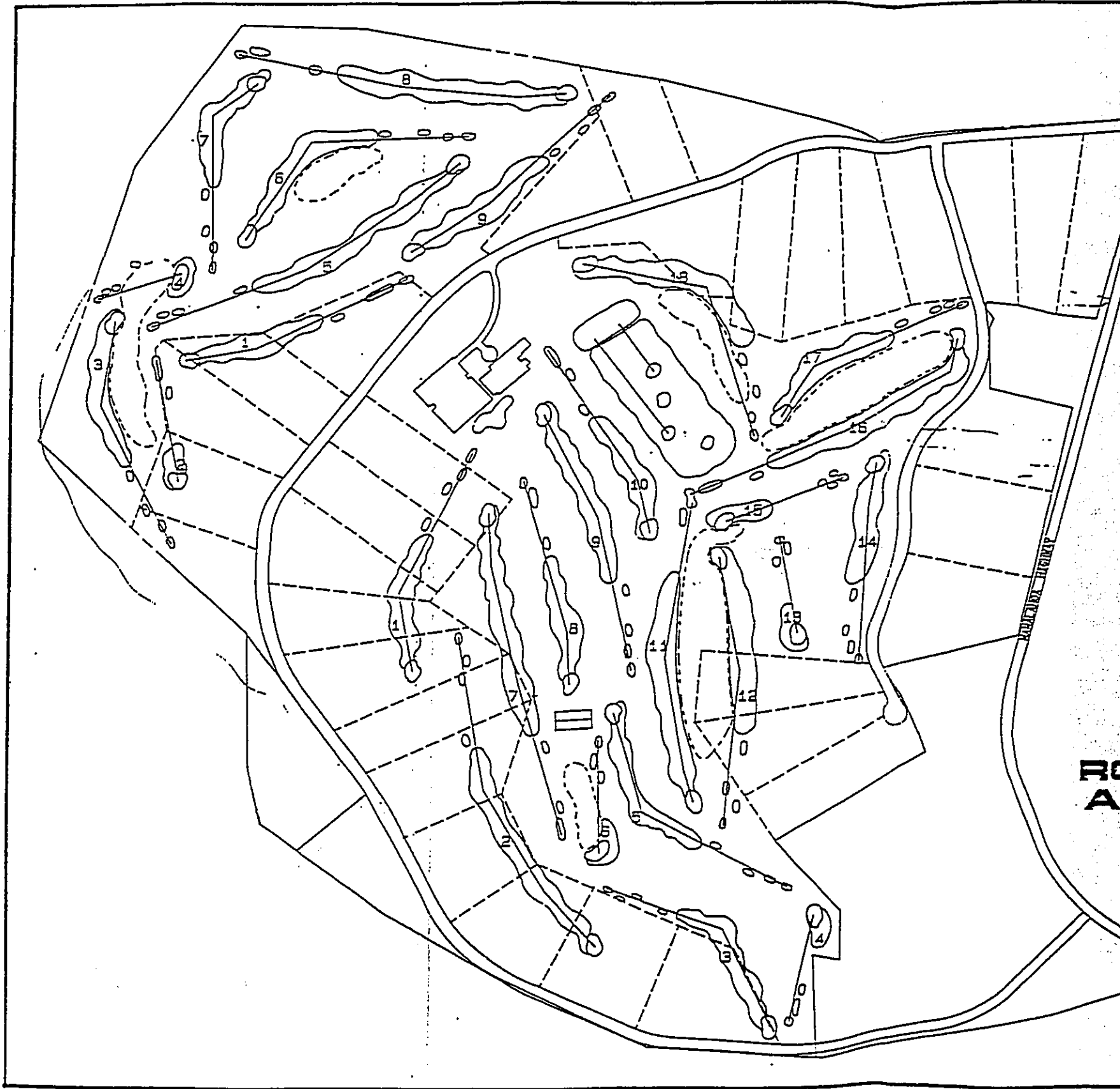
EXHIBIT B

STAMPED PARCELS 23, 7, 53, 24, 25.

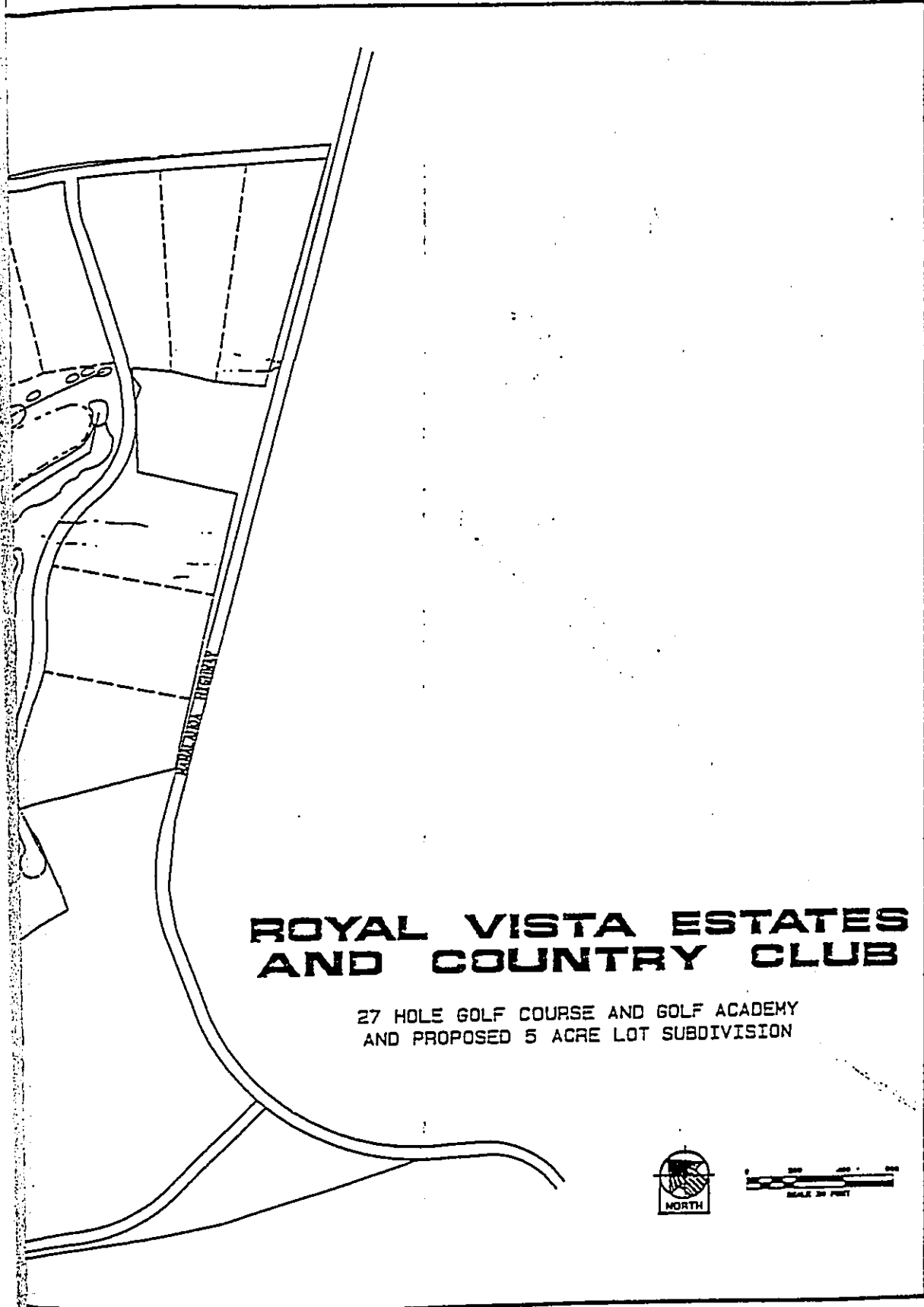
THIRD	DIVISION	
ZONE	SEC.	PLAT
7	1	05
CONTAINING PARCELS		
SCALE: 1" = 200'		

FLAT 04

23 Louis Topping & Mary - 7/2  
 24 Louis Topping & Mary - 7/2  
 25 Louis Topping & Mary - 7/2  
 26 Louis Topping & Mary - 7/2



RO  
A



**ROYAL VISTA ESTATES  
AND COUNTRY CLUB**

27 HOLE GOLF COURSE AND GOLF ACADEMY  
AND PROPOSED 5 ACRE LOT SUBDIVISION

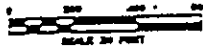


EXHIBIT C

MAR 14 1990



## Planning Commission

25 Aupuni Street, Rm. 109 • Hilo, Hawaii 96720 • (808) 961-8288

Bernard K. Akana  
Mayor

CERTIFIED MAIL

March 13, 1990

Mr. Sidney Fuke  
100 Pauahi Street, Suite 212  
Hilo, HI 96720

Dear Mr. Fuke:

Use Permit Application  
Royal Vista Estates and Country Club  
TMK: 7-1-05:9, 10, 26, 28-34, 39-41, 58, and 59

The Planning Commission at its duly held public hearing on March 1, 1990, voted to approve the above application, Use Permit No. 74, to allow the establishment of a 27-hole golf course and related improvements within the County's Unplanned (U) zoned district on the northwest (makai) side of the Mamalahoa Highway and across from the Puu Lani Ranch Subdivision, Puuanahulu Homesteads, North Kona, Hawaii.

Approval of this request is based on the following:

The establishment of a 27-hole golf course and related facilities within the Unplanned (U) zoned district will not be inconsistent with the general purpose of that zoned district, the intent and purpose of the Zoning Code, and the General Plan, provided adequate mitigating conditions are met.

The granting of this proposal would complement the goals of the General Plan's Recreation element which states to, "Provide a diversity of environments for active and passive pursuits" and to "Provide a wide variety of recreational opportunities . . . ." Since the proposal will be a private recreational facility and open to only members and their guests, a condition of approval to require the provision of a pro rata contribution towards public recreational facilities and/or improvements within the impacted region is being proposed to assure that the public recreational benefit is also balanced against the implementation of these recreational goals.

EXHIBIT D



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The subject request will also provide a form of perpetual open space, thus, maintaining the current open character of the surrounding area along with its natural and scenic qualities. The proposed development would, therefore, be consistent with the policies of the Recreation and Open space elements of the General Plan which state that recreational facilities in the County shall reflect the natural, historic, and cultural character of the area, and that the recreational use should be compatible with the adjacent areas. To further ensure that these General Plan elements are implemented, mitigating conditions relative to visual impact analysis, archaeological/historic investigation, and biological habitat preservation will also be imposed.

Golf courses are permitted uses within the State Land Use Agricultural District provided that the affected lands are not classified either A and B soils by the Land Study Bureau. The Land Study Bureau's overall master productivity ratings for agricultural use of the subject property are Classes D (poor) and E (very poor); therefore, consideration of a golf course within these State land use parameters is permissible.

The County Unplanned (U) zoned district applies to areas not subjected to sufficient studies to adopt specific district classifications. Among the permitted uses in this zoned district are single family dwellings, agricultural uses and activities, home occupations, hunting and fishing preserves or lodges, aquaculture activities, and accessory uses or structures. Since golf courses are not permitted uses in the Unplanned County zoned district, a Use Permit must be approved by the Planning Commission before the use can be established. Golf courses are permitted uses within the County Agricultural, Residential, and Open zoned districts.

The granting of the proposed use will not be materially detrimental to the public welfare nor cause substantial adverse impact to the community's character or to surrounding properties.

The character of land use in the immediate area is pasture, open space, and clustered single family residential homesteads. With the exception of cattle grazing, the area under consideration and immediately surrounding lands are basically in open space and not in intensive agricultural pursuits. It is, therefore, determined that impacts to the agricultural resources

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of the area are negligible. This finding is consistent with the Land Study Bureau's classification for the soils in the area.

The project area is generally isolated from privately held parcels of land; in fact, aside from the adjacent individually owned parcels and other surrounding properties held under the ownership and/or control of the Puuwaawaa Ranch, the remaining lands are predominantly large vacant parcels owned by the State of Hawaii.

The proposed golf courses and associated large lot rural/residential development will continue to change the character of the Puuanahulu area. This pattern of transformation, however, is already evident in the land use patterns adjacent to and abutting the subject property. Older, nonconforming parcels contain existing single family residences, while surrounding areas are already zoned for smaller, one-acre sized lots for residential use.

Given the economic inertia that golf courses and their related amenities generate, impacts to surrounding communities are usually substantial. However, given the support that this particular proposal has generated from the immediately impacted community, it is difficult to conclude that adverse impacts to the surrounding properties would be substantial.

In furtherance of that support, the petitioner has represented that commitments with respect to mitigation of property tax increases, long-term water availability, treatment of on-site burial sites, and community input on final design plans have been made to affected residents in the area. It is expected that these commitments will be honored even if it not provided for as conditions of approval in this Use Permit.

The potential long-term expansion of similar type uses to areas adjacent to Puuanahulu would be removed because of the present land tenure patterns and lack of essential utilities such as available water sources and transmission systems.

The granting of the proposed use will not adversely affect similar or related existing uses within the surrounding area, community, or region. As indicated previously, there are no similar or related land uses within the immediate surrounding area. These areas have already been committed to large lot rural residential type development which would essentially be compatible with the proposed golf course use.

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Page 4

Waikoloa, a major, self-contained master planned community situated approximately 15 miles to the north, is the closest project which provides similar recreational-type facilities and ancillary uses.

The granting of the proposed golf course will not unreasonably burden public agencies to provide the necessary utilities and services.

All essential utilities and services required for the development of a golf course and related facilities, including water from the private Puuwaawaa Water Works, are or will be made available to the subject property. Although public services such as police, fire, and medical assistance are only available from either Kailua or Waimea, those services should not be unreasonably burdened by the proposal itself. Additionally, conditions of approval relative to the provision of such services, if necessary, off-site roadway improvements, and Plan Approval requirements to accommodate the need for building safety and accessibility standards are being proposed.

A series of government "paper" roads are located within the project area. In the event the applicant is unsuccessful in having these roadways abandoned or acquired, the golf course and access roadways will be designed around them.

Approval of this request is subject to the following conditions:

1. The applicant, successors, or assigns shall comply with all of the stated conditions of approval, provided that this Use Permit and all rights conveyed therefrom shall not be wholly transferable or assignable without prior notification to the Planning Commission.
2. Final Plan Approval for the proposed golf course and related improvements shall be secured from the Planning Department within one year from the effective date of the permit. Prior to the submittal of said plans, the applicant shall solicit the input of the immediately impacted residents. To assure adequate time for Plan Approval review and in accordance with Chapter 25-244 (Zoning Code), plans shall be submitted a minimum of forty-five (45) days prior to the date by which Plan Approval must be secured. The Planning Department shall

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determine the related improvements and accessory uses to the golf course not inconsistent with the applicable provisions of the Zoning Code at the time of Plan Approval review.

3. Construction of the golf course and related improvements shall commence within one year from the date of receipt of Final Plan Approval and be completed within three (3) years thereafter.
4. To ensure that the goals and policies of the recreational element of the General Plan are implemented as proposed, the Department of Parks and Recreation, upon consultation with the County Council, and with the concurrence of the Planning Department, may require the provision of public recreational facilities and/or improvements within the project area or the affected districts as appropriate. The preliminary recreational needs determination, if any, shall be established prior to the granting of Final Plan Approval for the proposed golf course and related improvements, and shall be based upon the estimated cost of a similar public facility and/or improvements, less any credits for direct or indirect recreational benefits to impacted community members, compared to an overall regional assessment of existing and proposed public recreational facilities. The applicant shall provide its required pro rata share in a method not inconsistent with the requirements and criteria found in Chapter 8, Article 1 (Park Dedication Code) of the County Code prior to the opening of the proposed golf course or any related facility thereto, whichever occurs first.
5. In the design of the golf course, the County of Hawaii Planning Department's Guidelines for Golf Course Design (November 1989, as amended) shall be utilized. The Planning Department shall determine appropriate setback requirements, e.g. building and property line, at the time of Plan Approval review. Easements for golf course purposes over and across abutting lots, either existing or proposed, shall not be permissible. Existing public rights-of-way shall not be extinguished in favor of golf course purposes unless other equitable public rights of access are provided for.

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6. All structures shall be sited to minimize any potential visual impact to the highway and surrounding areas.
7. No individual fee interest, ownership, or title to any portion of the golf course shall be permitted without prior compliance with the Subdivision Code. Covenants or other assurances to prospective purchasers of membership(s) in the golf course, its facilities, or related developments shall include notification that a public landfill facility and rifle range are planned for the adjacent area.
8. An intensive archaeological and cultural interpretative survey shall be conducted and a report be submitted to the State Department of Land and Natural Resources, Historic Sites Program, and the Planning Department for review prior to receipt of Final Plan Approval and/or prior to the issuance of any grading or grubbing permit, whichever occurs first. Should any significant sites be found, a data recovery plan outlining appropriate mitigation measures shall be submitted to both agencies for review and approval.
9. Should any unanticipated archaeological sites or features be uncovered during land preparation activities, work within the affected area shall immediately cease and the State Department of Land and Natural Resources, Historic Sites Program, notified. No work within the affected area shall resume until clearance is obtained from the Planning Department based upon recommendations from the Historic Sites Program.
10. A complete biological survey shall be conducted and a recommended mitigation plan, if necessary, shall be submitted for review and approval by the U.S. Fish and Wildlife Service and the State Department of Land and Natural Resources prior to issuance of any land development permit for the property.
11. The use of pesticides and herbicides in conjunction with all phases of operation shall conform with the applicable regulations of appropriate governmental agencies.
12. During construction, best effort measures shall be taken to minimize the potential of both fugitive dust and runoff

sedimentation. Such best effort measures shall be in compliance with construction industry standards and practices utilized during construction projects of the State of Hawaii.

13. Prior to construction, the applicant shall demonstrate to the satisfaction of the Planning Director that all proposed off-site construction material such as topsoil or sand are being supplied from an approved quarry or resource site.
14. Access(es) to the proposed development from Mamalahoa Highway, including channelized intersection improvements with left turn storage lanes and acceleration and decelerations lanes, shall meet with the approval of the State Department of Transportation, Highways Division.
15. All interior roadways shall be constructed to County dedicable standards. Public access to the makai State lands shall be provided for hunting and other recreational uses meeting with the approval of the Department of Land and Natural Resources, Wildlife Division.
16. The applicant shall provide adequate water service and back-up facilities or assurances to meet the demands for fire protection and all domestic related facilities prior to the issuance of any occupancy permit.
17. An annual progress report shall be submitted to the Planning Director prior to the anniversary date of the approval of the permit. The report shall include, but not be limited to, the status of the development and to what extent the conditions of approval are being complied with. This condition shall remain in effect until all of the conditions of approval have been complied with and the Planning Director acknowledges that further reports are not required.
18. An extension of time for the performance of conditions within the permit may be granted by the Planning Director upon the following circumstances: a) the non-performance is the result of conditions that could not have been foreseen or are beyond the control of the applicant, successors, or assigns and that are not the result of their fault or negligence; b) granting of the time extension

Mr. Sidney Fuke  
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would not be contrary to the General Plan or Zoning Code;  
c) granting of the time extension would not be contrary to the original reasons for the granting of the permit; and  
d) the time extension granted shall be for a period not to exceed the period originally granted for performance (i.e., a condition to be performed within one year may be extended for up to one additional year). Further, should any of the conditions not be met or substantially complied with in a timely fashion, the Director may initiate procedures to revoke the permit.

This approval does not, however, sanction the specific plans submitted with the application as they may be subject to change given specific code and regulatory requirements of the affected agencies.

Please feel free to contact the Planning Department if there are any questions on this matter.

Sincerely,

*Mike Luce*

Mike Luce  
Vice Chairman, Planning Commission

xc: Mr. Scott Turney  
Alan Maeda, Esq. (via facsimile 544-8399)  
Department of Public Works  
Department of Water Supply  
County Real Property Tax Division  
Planning Office - Kona  
DLNR

# **CHAR & ASSOCIATES**

Botanical/Environmental Consultants

4471 Puu Panini Ave.  
Honolulu, Hawaii 96816  
(808) 734-7828

15 February 1990

## **BOTANICAL ASSESSMENT ROYAL VISTA ESTATES GOLF COURSE PU'UANAHULU, NORTH KONA, HAWAI'I**

### **INTRODUCTION**

Premier Resorts Development, Inc., proposes to develop a 27-hole golf course at Pu'uanahulu, North Kona. A number of estate lots, offering a panoramic vista of the course, will also be developed. The proposed project site covers approximately 457.66 acres.

Field studies to assess the botanical resources found on the proposed project site were conducted on February 10th and 11th, 1990. Two teams composed of two botanists each conducted a walk-through survey of the site. Ranch roads provided the major access onto most of the property. The primary objectives of the field studies were to (1) provide a general description of the vegetation, and (2) search for threatened and endangered plant species protected by Federal and/or State laws.

### **DESCRIPTION OF THE VEGETATION**

Plant names used in the following discussion are in accordance with Wagner et al. (in press) in most cases.

The project site is characterized by rolling pasture lands with some hilltop areas covered by stands of introduced tree species such as lemon-scented gum (Eucalyptus citriodora), black-wattle

EXHIBIT E



(Acacia mearnsii), and silk oak (Grevillea robusta). Pu'u Pa silt loam soil (PWD), with 12 to 20% slopes, covers the majority of the site (Sato et al. 1973). This soil type is relatively deep; more than 48 inches before reaching the underlying trachyte material. Kikuyu grass (Pennisetum clandestinum) and Rhodes grass (Chloris gayana) are the dominant grass species on this soil type along with a mixture of various legumes which include Glycine wightii, indigo (Indigofera suffruticosa), Spanish clover (Desmodium incanum), cow pea (Macroptilium lathyroides), black medic (Medicago lupulina), and bur clover (Medicago polymorpha).

P'u Pa extremely stony, very fine sandy loam (PVF3) is found around the perimeter of the property and on some of the more steeply sloping hills. In general, these areas with thin soil and rocks support forage grasses of poor quality such as fountain grass (Pennisetum setaceum), pitted beardgrass (Bothriochloa pertusus), and fuzzy top (Bothriochloa barbinodis). Weedy shrubs and herbs are also more frequently associated with this soil type. Among the weedy plants are lantana (Lantana camara), hairy horseweed (Conyza canadensis), two species of rattlebox (Crotalaria pallida, C. incana), wild peppergrass (Lepidium virginicum), bull thistle (Cirsium vulgare), spiny amaranth (Amaranthus spinosus), pigweed (Portulaca oleracea), prickly pear or panini (Opuntia ficus-indica), and sourbush (Pluchea symphytifolia).

Along ranch roads, some species may be locally common; these include the white-flowered Santa Maria herb (Parthenium hysterophorus), African dropseed (Sporobolus africanus), Bermuda grass or manienie (Cynodon dactylon), and wiregrass (Eleusine indica).

Tree species commonly used for reforestation are found on the project site, usually on hilltops and steeply sloping areas. Large blocks of Eucalyptus, primarily lemon-scented gum, form

stands 50 to as much as 70 ft. tall. Also common are black-wattle, silk oak, and ironwood (Casuarina equisetifolia). Occurring as scattered individuals or small clusters of trees are kiawe (Prosopis pallida), jacaranda (Jacaranda mimosifolia), Chinaberry (Melia azedarach), and California peppertree (Schinus molle). Six trees of wiliwili (Erythrina sandwicensis), a species native only to the Hawaiian Islands, are found along the northern boundary of the property where it abuts a somewhat sparsely vegetated lava flow.

#### THREATENED AND ENDANGERED SPECIES

No officially listed threatened and endangered species, protected by Federal and/or State endangered species laws, were found on the site; nor did we encounter any plants proposed or candidate (U. S. Fish and Wildlife Service 1985; Herbst 1987) for such status.

None of the native species inventoried on the site are considered rare; they all occur throughout the Hawaiian Islands in similar environmental conditions. Some, such as the 'uhaloa (Waltheria indica), popolo (Solanum americanum), 'ilima (Sida fallax), and koali (Ipomoea indica), prefer the more open, disturbed habitats. The wiliwili occurs in dry forests of all the main Hawaiian Islands; it is a characteristic feature of the lava fields of North Kona.

#### DISCUSSION AND RECOMMENDATIONS

Vegetation on the project site is dominated by introduced forage species, primarily Rhodes grass and kikuyu grass along with various legumes. Tree species commonly used for reforestation are found scattered through the site, primarily along the perimeter of the property and hilltops. Because the site is covered by deep, well-drained soil, it has been in use for a long period of time.

At one time, corn (Zea mays) was grown on a portion of the site and pasture grasses were mowed and baled for hay.

No sensitive native plant communities or threatened and endangered plants occur on the site and there is very little of botanical interest or concern on the property. The proposed development is not expected to have a significant negative impact on the botanical resources. There are no botanical reasons to impose any restrictions, impediments or conditions to the development of this site.

#### References

- Herbst, D. 1987. Status of endangered Hawaiian plants. Hawaiian Botanical Society Newsletter 26(2): 44-45.
- Sato, H. H., W. Ikeda, R. Paeth, R. Smythe, and M. Takehiro, Jr. 1973. Soil survey of the island of Hawaii, State of Hawaii. U. S. Dept. of Agriculture, Soil Conservation Service, Washington, D. C.
- U. S. Fish and Wildlife Service. 1985. Endangered and threatened wildlife and plants; Review of plant taxa for listing as Endangered and Threatened Species; Notice of review. Federal Register 50(188): 39526-39527 plus 57-page table of species.
- Wagner, W. L., D. R. Herbst, and S. H. Sohmer. In press. Manual of the flowering plants of Hawai'i. Univ. of Hawaii Press and B. P. Bishop Museum Press, Honolulu.

SURVEY OF THE AVIFAUNA AND FERAL MAMMALS  
AT PUJANAHULU, NORTH KONA, HAWAII

Prepared for  
Premier Resorts Development, Inc.  
and  
Sidney Fuke and Associates

by

Phillip L. Bruner  
Assistant Professor of Biology  
Director, Museum of Natural History  
BYU-H  
Laie, Hawaii 96762

7 February 1990

EXHIBIT F

SURVEY OF THE AVIFAUNA AND FERAL MAMMALS  
AT PUUANAHULU, NORTH KONA, HAWAII

INTRODUCTION

The purpose of this report is to summarize the findings of a two day (3-4 February 1990) bird and mammal field survey of property proposed for golf course development located at Puuanahulu, North Kona, Hawaii (see Fig.1). Also included are references to pertinent literature as well as unpublished reports and personal communications.

The objectives of the field survey were to:

- 1- Document what bird and mammal species occur on the property or may likely occur given the type of habitat available.
- 2- Provide some baseline data on the relative abundance of each species.
- 3- Determine the presence or likely occurrence of any native fauna particularly any that are considered "Endangered" or "Threatened". If such occur or may likely be found on the property identify what if any features of the habitat may be essential for these species.
- 4- Determine if the property contains any special habitats that if lost or altered by development might result in a significant impact on the fauna in this region of the island.

#### GENERAL SITE DESCRIPTION

The project site is located at Puuanahulu in North Kona, Hawaii (see Fig.1). Access to the site is from Mamalahoa Highway. The property is presently used for ranching. Rolling hills covered in pasture grass and patches of exotic trees such as Silk or Silver Oak (Grevillea robusta), Ironwood (Casuarina spp.), Eucalyptus (Eucalyptus spp.) and Kiawe (Prosopis pallida) dominate the site. The habitat could best be described as parkland.

Weather during the field survey was variable with clear mornings and cloudy afternoons. Winds were also variable with calm mornings and light tradewinds in the afternoons.

#### STUDY METHODS

Field observations were made with the aid of binoculars and by listening for vocalizations. These observations were concentrated during the peak bird activity periods of early morning and late afternoon. Attention was also paid to the presence of tracks and scats as indicators of bird and mammal activity.

At various locations (see Fig.1) eight minute counts were made of all birds seen or heard. Between these counts stations walking tallies of birds seen or heard were also kept. These counts provide the basis for the relative abundance estimates given in this report. Unpublished reports of birds known from

similar habitat on lands elsewhere in West Hawaii were also consulted in order to acquire a more complete picture of possible avifaunal activity (Brumer 1985, 1988a, 1988b, 1989a, 1989b). In addition Jon Giffin, a wildlife biologist familiar with this area, was also contacted for information about the avifauna of the region. Observations of feral mammals were limited to visual sightings and evidence in the form of scats and tracks. No attempts were made to trap mammals in order to obtain data on their relative abundance and distribution. Two evenings were devoted to searching for the presence of owls and the Hawaiian Hoary Bat (Lasiurus cinereus semotus).

Scientific names used herein follow those given in the most recent American Ornithologist's Union Checklist (A.O.U. 1983), Hawaii's Birds (Hawaii Audubon Society 1989); A Field Guide to the Birds of Hawaii and the Tropical Pacific (Pratt et al. 1987), Mammal Species of the World (Honacki et al. 1982) and Hawaiian Forest Plants (Merlin 1980).

#### RESULTS AND DISCUSSION

##### Resident Endemic (Native) Land and Water Birds:

Short-eared Owl or Pueo (Asio flammeus sandwichensis) - This species is relatively common in Hawaii particularly at higher elevations (Berger 1972, Hawaii Audubon Society 1989,

Pratt et al. 1987). This endemic subspecies is listed by the State of Hawaii as "endangered" on Oahu but not elsewhere in the State. One Pueo was seen flying across the NW sector of the property at 1000 hours on 3 February.

Hawaiian Hawk or 'Io (Buteo solitarius) -

The 'Io is an endangered species and is listed on both federal and state lists. On 4 February a single 'Io was seen soaring over the property at 0820 hours. The bird remained in the area for only a few minutes then moved off in the direction of Puu Waa Waa Ranch. 'Io forage primarily in open country (Hawaii Audubon Society 1989). No nest was found and it is likely the bird was simply passing through the area on its way to more upland habitats.

Common Amakihi (Hemignathus virens) -

This native forest bird is not endangered and along with its relative the Apapane (Himatione sanguinea) it has managed to survive in good numbers where other related species in the sub-family Drepanidinae have not fared so well. Part of its success lies in its generalized feeding patterns which have allowed it to range outside of native forest and forage in exotic trees. A total of 13 Amakihi were recorded over the two days of the survey. All were found in Silk Oak and Eucalyptus trees along the eastern edge of the property near Puu Lani.

No other endemic birds were recorded on the survey. Jon Giffin reported that Hawaiian Goose or Nene (Nesochen sandvicensis) occur in the area of Puu Waa Waa and surrounding lands (pers. comm.). The size of the Nene population in this region is unknown



but flocks of up to 25 birds have been observed. This population (Giffin pers. comm.) was probably derived from two sources, captive propagated birds released by the State of Hawaii in the Saddle Road area and escaped or released birds from a privately held flock. Nene utilize open upland habitat and lava flows. No Nene were found on the survey of the property proposed for golf course development at Puuanahulu. This species could, however, potentially utilize this site for foraging and perhaps also for nesting.

Migratory Indigenous (Native) Birds:

Migratory shorebirds winter in Hawaii between the months of August through May. Some juveniles will stay over the summer months as well (Johnson et al. 1981, 1983, 1989). Of all the shorebird species which winter in Hawaii the Pacific Golden Plover (Pluvialis fulva) is the most abundant. Plovers prefer open areas such as mud flats, lawns, pastures, plowed fields and roadsides. They arrive in Hawaii in early August and depart to their arctic breeding grounds during the last week of April (Johnson et al. 1981). Bruner (1983) has also shown plover are extremely site-faithful (returning each day and each year to the same spot) on their wintering grounds and many establish foraging territories which they defend vigorously. Such behavior makes it possible to acquire a fairly good estimate of the abundance of plover in any one area. These populations likewise remain relatively

stable over many years (Johnson et al. 1989). A total of 23 plover were recorded during the survey. These birds were either observed flying over the property or foraging in the more open heavily grazed parts of the pasture. Much of the property, however, is unsuitable for plover as the grass is much too dense and high. Several plover were also heard calling after dark. Apparently they leave their foraging grounds and aggregate at night on barren lava flows down slope. This behavior probably is an antipredator strategy similar to rooftop roosting which has been observed on Oahu (Johnson and Nakamura 1982). No other migratory birds would likely be found on the present property.

Resident Indigenous (Native) Birds:

This category includes only those species which are native but not endemic, such as the Black-crowned Night Heron (Nycticorax nycticorax). No indigenous species were recorded nor would any be expected at this site.

Resident Indigenous (Native) Seabirds:

None were observed on the property. Some seabirds nest and roost in upland habitats in Hawaii, but at much higher elevations than this property. (Pratt et al. 1987).

Exotic (Introduced) Birds:

A total of 17 species of exotic birds were recorded during

the field survey. Table One shows the relative abundance of each species. The most abundant species were Saffron Finch (Sicalis flaveola), House Finch (Carpodacus mexicanus), Yellow-fronted Canary (Serinus mozambicus) and Eurasian Skylark (Alauda arvensis). Game birds such as Black Francolin (Francolinus francolinus), Gray Francolin (Francolin pondicerianus) and Erckel's Francolin (Francolinus erckelli) were also numerous. Two species of pheasants, Ring-necked Pheasant (Phasianus colchicus) and Kalij Pheasant (Lophura leucomelana) also are numerous at this site. Given the present habitat and its location, and data from other surveys (Bruner 1985, 1988a, 1988b, 1989a, 1989b) as well as information provided in Berger (1972), Pratt et al. (1987) and Hawaii Audubon Society (1989) the following exotic bird species might also be expected to occasionally occur on or near the property: Common Barn Owl (Tyto alba), California Quail (Callipepla californica), Japanese Quail (Coturnix japonica), Mourning Dove (Zenaidura macroura), Chestnut-bellied Sandgrouse (Pterocles exustus) and Lavender Waxbill (Estrilda caerulescens).

Feral Mammals:

Feral Goats (Capra hircus) were observed on property makai of the site. Small Indian Mongoose (Herpestes auropunctatus) was seen but no rats, mice or cats were recorded, however, it would be highly unusual if these ubiquitous animals did not occur on the property. Without a trapping program it is difficult to conclude much about the relative abundance of these species.

Records of the endemic and endangered Hawaiian Hoary Bat (Lasiurus cinerus semotus) are sketchy but the species has been reported from Hawaii (Tomich 1986). None were observed on this field survey despite two nights of observations. This species roosts solitarily in trees. Much remains to be known about the natural history of this bat and its ecological requirements here in Hawaii.. Bruner (1984) found bats on the Sheraton Waikoloa Beach Resort property which is located makai and to the north of this property. Hannah K. Springer, a life long resident of North Kona, reports seeing bats frequently in the upper Kaupulehu area (pers. comm.).

#### CONCLUSION

A brief field survey can at best provide only a limited perspective of the wildlife present in any given area. Not all species will necessarily be observed and information on their use of the site must be sketched together from brief observations, the available literature and from reports by people familiar with the region. The number of species and the relative abundance of each species may vary throughout the year due to available resources and reproductive success. Species which are migratory will quite obviously be a part of the faunal picture only at certain times during the year. Exotic species sometimes prosper for a time only to later disappear or become a less significant part of the ecosystem (Williams 1987). Thus only long term studies

can provide an in depth view of the bird and mammal populations in a particular area. However, when brief field studies are coupled with data gathered from other similar habitats the value of the conclusions drawn can be significantly increased.

The following are some general conclusions related to bird and mammal activity on this property.

- 1- The present habitat provides a limited range of living spaces which are utilized by the typical array of exotic species of birds one would expect at this elevation and in this type of environment in Hawaii. However, some species typically found in this habitat were not recorded. This could have been due to the fact that the survey was too brief or that their numbers are so low that they went undetected or a combination of these and other factors.
- 2- A total of three endemic species were recorded. All of these species are reasonably common on Hawaii even though the 'Io is listed as endangered. This property does not offer anything unusual or unique for these birds. Abundant habitat of the type found on this site occurs in the North Kona and South Kohala region. The question of how important is this property to Nene went unresolved since no Nene were recorded. It is my judgment that Nene could use the site for foraging whether it was to remain in pasture or be converted to golf course. The extent to which Nene may use the property is, however, unknown. Nene nesting at this locality may be less likely

due to the open (unprotected) nature of the pasture versus the more brushy sheltered habitat of an upland "native" parkland or grassland.

- 3- The proposed development will alter existing habitats and create an environment suitable to a more limited array of birds. Exotic species which may increase in abundance include: Common Myna (Acridotheres tristis), Zebra Dove (Geopelia striata) and Spotted Dove (Streptopelia chinensis). Other species such as game birds like Black Francolin will become less abundant due to a loss of cover for foraging and nesting. While some individuals may be able to disperse into adjoining undisturbed habitat many may be restricted from doing so if other adjacent habitats are already at the carry capacity. Species which are territorial will find it even more difficult to establish elsewhere.
- 4- One native bird which will profit by the conversion of the land from pasture to golf course is the Pacific Golden Plover. This species prefers lawn habitats where it can forage for insects. Although golf courses regularly use pesticides, thus reducing the availability of insect prey, plover never-the-less are attracted to these areas. The present population of approximately 25 plover should increase significantly in the years following development of a golf course.
- 5- In order to obtain more definitive data on mammals, a trapping program would be required. No endangered species were observed.

RECOMMENDATION

Pesticides and herbicides typically used in golf course operations potentially present problems for foraging birds. I would recommend that appropriate government agencies be consulted as to which pesticides and herbicides may be used "safely".

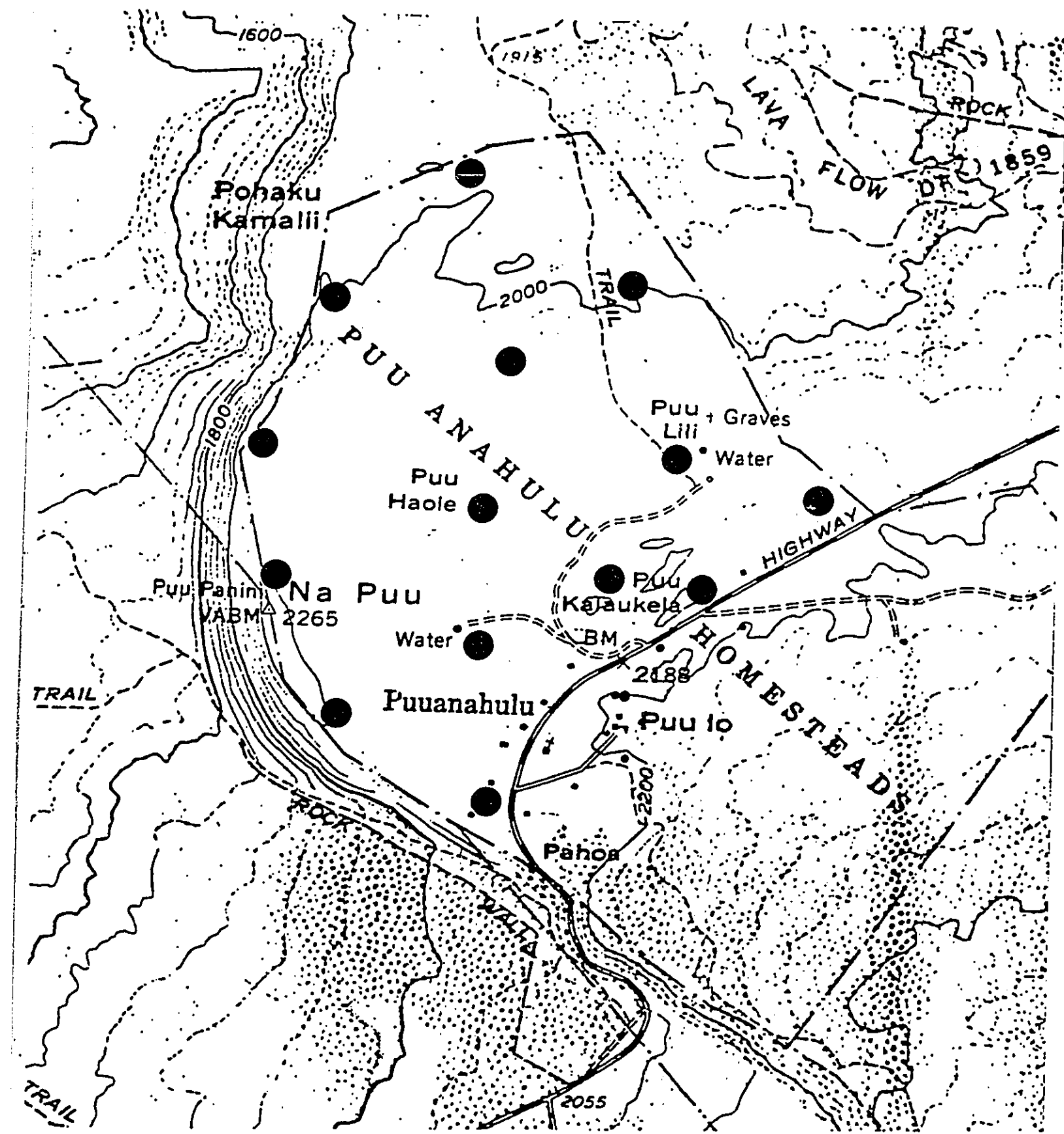


Fig. 1 Project site with locations of eight minute census stations shown as solid circles.



TABLE 1

Exotic species of birds recorded at Puuanahulu, North Kona, Hawaii

COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE*
Ring-necked Pheasant	<u>Phasianus colchicus</u>	C = 5
Kalij Pheasant	<u>Lophura leucomelana</u>	C = 6
Black Francolin	<u>Francolinus francolinus</u>	C = 9
Gray Francolin	<u>Francolinus pondicerianus</u>	U = 4
Erckel's Francolin	<u>Francolinus erckelli</u>	C = 6
Spotted Dove	<u>Streptopelia chinensis</u>	U = 2
Zebra Dove	<u>Geopelia striata</u>	C = 9
Common Myna	<u>Acridotheres tristis</u>	C = 6
Northern Cardinal	<u>Cardinalis cardinalis</u>	U = 2
Northern Mockingbird	<u>Mimus polyglottos</u>	R = 1
Saffron Finch	<u>Sicalis flaveola</u>	A = 14
Japanese White-eye	<u>Zosterops japonicus</u>	U = 4
Nutmeg Mannikin	<u>Lonchura punctulata</u>	C = 6
House Finch	<u>Carpodacus mexicanus</u>	A = 11
House Sparrow	<u>Passer domesticus</u>	R = 4
Yellow-fronted Canary	<u>Serinus mozambicus</u>	A = 17
Eurasian Skylark	<u>Alauda arvensis</u>	A = 12

\* (see page 14 for key to symbols)

KEY TO TABLE 1

Relative abundance = number of times observed during survey or  
frequency on eight minute counts.

A = abundant (ave. 10+) (number which follows is average of data  
from all survey days)

C = common (ave. 5-10)

U = uncommon (ave. less than 5)

R = recorded (seen or heard at times other than on 8 min. counts.  
Number which follows is the total number of individuals  
seen or heard)

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JOHN WAIHEE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF FORESTRY AND WILDLIFE  
1151 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813

APR 3 1990

WILLIAM W. PATY, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

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LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

March 29, 1990

Mr. Sidney M. Fuke  
Sidney Fuke and Associates  
100 Pauahi Street, Suite 212  
Hilo, Hawaii 96720

Dear Mr. Fuke:

Subject: Faunal Survey - Puuanahulu Area

I have received your request for comments on the biological aspects of creating a golf course at Puuanahulu, North Kona, Hawaii; as well as a copy of a survey of the avifauna and feral mammals by Dr. Phillip Bruner.

I have the following comments:

1. P. 2, para. 1 - The cursory vegetation description provided by Dr. Bruner seems to indicate that this area does not contain any rare or endangered native or Hawaiian vegetation. However, single specimens of rare Hawaiian plants have been found in this general area. Therefore, I assume that a complete floral survey of the area will be conducted to determine the presence of rare or endangered native Hawaiian plants.
2. P. 5, para. 1 - Although nene have traditionally been associated with upland habitat and depauperate lava flows, more recent evidence suggests that they may prefer lowland pastures. Typical golf course grasses do not provide sufficient nutrition for nene, however, native or other appropriate high-quality grasses might be planted around water hazards to enhance the area as acceptable nene habitat.
3. P. 7, para. 1 - Creation of large areas of "rough" would help mitigate the loss of game bird nesting areas.
4. Over the last several years, an increasing number of wild owls (both the introduced common barn owl--Tyto alba and the endemic short-eared owl--Asio f.

EXHIBIT G

Mr. Sidney M. Fuke  
Page 2  
March 29, 1990

sandwichensis) have died of unknown causes. Disease has been ruled out, but the role of pesticide and herbicides and/or their interactions has not as yet been determined. Because of this, I urge you consider protocols to minimize or eliminate pesticide/herbicide contamination of water regimes.

5. State land surrounds much of the golf course site, we are therefore concerned about the amounts of pesticides and herbicides contained in runoff and their potential effects on surrounding State lands. This problem should be addressed prior to the issuance of a land development permit.
6. Annotations on the report are also enclosed.

Thank you for the opportunity to comment on this proposal.

Sincerely yours,



RONALD L. WALKER  
Wildlife Program Manager

Enclosure

cc: Ronald Bachman, District Biologist, Hawaii



United States Department of the Interior

FISH AND WILDLIFE SERVICE  
PACIFIC ISLANDS OFFICE

P.O. BOX 50167  
HONOLULU, HAWAII 96850

APR 2 1990

March 30, 1990

Sidney M. Fuke  
Sidney Fuke and Associates  
100 Pauahi Street, Suite 212  
Hilo, HI 96720

Dear Mr. Fuke:

Dr. Jim Jacobi of the Hawaii Research Group at Volcano recently forwarded a copy of your March 12 letter to this office for response. In your letter you ask for comments on a faunal survey report of the Puuanahulu area on the Big Island. A golf course has evidently been proposed for this area.

Our concerns focus on native species protected by the Migratory Bird Treaty Act and threatened or endangered species protected by the Endangered Species Act. The project site generally supports a host of introduced birds and is considered marginal habitat for migratory birds or endangered species that might be found in the area. The biological survey adequately addresses these species and issues.

Endangered species that would be expected to occur and/or have been reported at the site include those mentioned in the report: the Hawaiian Hawk or 'Io, the Hawaiian Goose or Nene, and the Hawaiian hoary bat. The area is not considered to be prime or essential habitat for any of these three species, although nesting by Nene has been reported here in the past. (This nest was placed under a house. The bird was possibly semi-domestic from a flock at Puuwaawaa.) Current use of this area by these species is probably limited to occasional feeding forays.

The only migratory bird that would be expected in the area is the Pacific Golden Plover, as found during the biological survey. As noted in the report, this species, because of its propensity for open mowed areas, might become more abundant if a golf course were developed at the site.

Our recommendations would include the following:

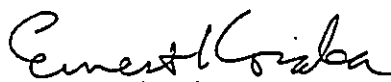
Golf courses and pastures may eventually become important habitats for the recovery of Nene. As such, golf courses in Hawaii could incorporate design and operation factors that might aid the Nene. At least three management actions should be considered: 1) Use pesticides and herbicides as little as possible and in accordance with all pertinent regulations and application instructions. 2) Initiate a predator control program if Nene begin to regularly use a golf course, particularly if nesting is attempted, and 3) Build ponds that might be used by Nene. Although Nene can survive without ponds and wetlands, they are attracted to such sites. The ranch pond at Puuwaawaa is commonly used by Nene and is a case in point.

EXHIBIT H

A second recommendation would be to design the golf course with at least a dozen "patches" of trees at least an acre in size each. These trees would provide resting or roosting sites for the Hawaiian Hawk and the Hawaiian Hoary Bat. Even though use of such sites by these species might be minimal, this habitat would be available for these species if it was needed.

Feel free to forward a copy of this letter to the County Planning Department.

Sincerely,

  
Ernest Kosaka  
Field Office Supervisor

cc: Dr. Jim Jacobi



**Archaeological Field Inspection Survey  
Royal Vistas Estates Development**

**Land of Puuanahulu  
North Kona District, Island of Hawaii**

by

**Alan T. Walker, B.A.  
Supervisory Archaeologist**

and

**Paul H. Rosendahl, Ph.D.  
Principal Archaeologist**

Prepared for

**Premier Resort Development  
c/o Mr. Scott Turney  
75-5751 Kuakini Highway, Suite 201  
Kailua-Kona, Hawaii 96745**

October 1989

**PHRI**

**Paul H. Rosendahl, Ph.D., Inc.**

*Archaeological • Historical • Cultural Resource Management Studies & Services*

305 Mohouli Street • Hilo, Hawaii 96720 • (808) 969-1763 • FAX (808) 961-6998

EXHIBIT I

## SUMMARY

At the request of Mr. Sidney Fuke of Sidney Fuke & Associates, for his client, Premier Resort Development, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological field inspection survey at the Royal Vistas Estates Development project area consisting of c. 400 acres located within the Land of Puuanahulu, North Kona District, Island of Hawaii (TMK:3-7-1-05:26-34,39-41). The overall objective of the survey was to provide information appropriate to and sufficient for subdivision and other development permit applications to be made to the County of Hawaii. The survey field work was conducted August 23 and September 8, 1989 under the supervision of PHRI Supervisory Archaeologist Alan T. Walker and under the overall direction of PHRI Principal Archaeologist Dr. Paul H. Rosendahl. The field crew included PHRI Field Archaeologists Robert Noah, Richard Sullivan, and Jack Harris. Approximately 26 man-hours of labor were expended conducting the survey field work.

During the survey, 11 sites were newly identified. The sites consist of a number of formal feature types—terrace, rock mounds, enclosure, boulder alignments, modified outcrop, box C-shape, cistern, and possible cultural deposit. Functional types tentatively identified include habitation, burial, water catchment, ceremonial, and indeterminate.

Four of the 11 sites (36.4% of total sites) are assessed as significant solely for scientific information content (Sites 13164, 13167, 13170, and 13171\*). Further data collection is recommended for all four sites. After further data collection is completed, if warranted, a data recovery plan should be prepared and implemented for sites not recommended for preservation or interpretation.

Of the remaining seven sites (63.6%), four (57.1%) are assessed as culturally significant and valuable for information content (Sites 13161, 13165, 13168, and 13169). These four sites have been identified as family cemeteries and contain human burial remains. For these four sites, further data collection (detailed recording only) is recommended. One of the remaining seven sites (13166) is assessed as significant for information content and is tentatively

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\* State Inventory of Historic Places (SIHP) site numbers. SIHP numbers are five-digit numbers prefixed by 50-10-20- (50=State of Hawaii; 10=Island of Hawaii; 20=USGS 7.5" series quad map ["Puu Anahulu, Hawaii"]).

evaluated as culturally significant. This site may contain a burial; further data collection is recommended for it, and preservation "as is" is tentatively recommended, pending data collection results. The final two sites (Sites 13162 and 13163) are assessed as significant for information content, cultural value, and as excellent examples of site types. These two sites are situated outside of the project area. Because they are situated near the project area boundary and may be adversely affected by future development, further data collection is recommended for them to be followed by preservation "as is."

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## INTRODUCTION

### BACKGROUND

At the request of Mr. Sidney Fuke of Sidney Fuke & Associates, for his client, Premier Resort Development, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological field inspection survey at the Royal Vistas Estates Development project area, consisting of c. 400 acres located within the Land of Puuanahulu, North Kona District, Island of Hawaii (TMK:3-7-1-05: 26-34,39-41). The overall objective of the survey was to provide information appropriate to and sufficient for subdivision and other development permit applications to be made to the County of Hawaii.

The survey field work was conducted August 23 and September 8, 1989 under the supervision of PHRI Supervisory Archaeologist Alan T. Walker and under the overall direction of PHRI Principal Archaeologist Dr. Paul H. Rosendahl. The field crew included PHRI Field Archaeologists Robert Noah, Richard Sullivan, and Jack Harris. Approximately 26 man-hours of labor were expended conducting the survey field work.

### SCOPE OF WORK

The basic purpose of the inspection survey was to identify—to discover and locate on available maps—any sites and features of potential archaeological significance present within the specified project area. A field inspection survey comprises the initial level of archaeological investigation. It is extensive rather than intensive in scope, and is conducted basically to determine the presence or absence of archaeological resources within a specified project area. A field inspection survey is often conducted preliminary to an inventory survey. A full inventory survey comprises a more comprehensive level of archaeological investigation. It indicates both the general nature and variety of archaeological remains present, and the general distribution and density of such remains. It permits general significance assessments of archaeological resources, and facilitates formulation of realistic recommendations and estimates for any subsequent work that might be necessary or appropriate. Such further work could include intensive survey—data collection involving detailed recording of sites and features, and selected test excavations; and possibly subsequent mitigation—data recovery research excavations, construction monitoring, interpretive planning and development, and/or preservation of sites and features with significant scientific research, interpretive, and/or cultural values.

The specific objectives of the field inspection survey were to make a general assessment concerning (a) the presence or absence of any sites or features of possible archaeological significance within the limits of the project area, and (b) the implications of any such remains in regard to feasibility of development.

Based on a preliminary review of available background literature and records, and on discussions with Mr. Fuke and with Ms. Virginia Goldstein, staff planner and historic sites specialist in the Hawaii County Planning Department (HCPD), and with Dr. Ross Cordy, chief archaeologist in the State Department of Land and Natural Resources-Historic Sites Section/State Historic Preservation Office (DLNR-HSS/SHPO), the following specific tasks were determined to constitute an adequate and appropriate scope-of-work for the present inspection survey:

1. To review and evaluate readily available archaeological and historical documentary literature relevant to the immediate project area, and to conduct limited work with available and appropriate local informants;
2. Conduct a 100%-coverage, low-level (30-50 ft altitude) aerial reconnaissance (helicopter) of the entire project area, with special emphasis on identifying and plotting on aerial photographs and/or maps (a) any sites observed and (b) areas devoid of sites (e.g., mechanically altered lands);
3. Conduct variable-coverage (sample), variable-intensity (30-90 ft intervals) ground reconnaissance (pedestrian and vehicular) of the project area, with the actual extent and intensity of coverage determined on the basis of the aerial survey; and
4. Analyze background and field data, and prepare appropriate reports—including, if appropriate, a scope-of-work (with specific field work and other non-field tasks) and accurate man-day estimates for any subsequent archaeological work, such as a full-scale inventory survey, that might be necessary.

### PROJECT AREA DESCRIPTION

The Royal Vistas Estates Development project area consists of approximately 400 ac situated in the Land of Puuanahulu, North Kona District, Island of Hawaii (TMK:3-

7-1-05:26-34,39-41) (Figure 1). The project area is bounded on the west by Na Pua, Pohaku Kamalii, and the adjacent Land of Puuwaawaa, on the north by a ranch fence line and Puu Kukai, on the east by a ranch rock wall and Hawaii State land, and on the south by private residential parcels and Puu Kalaukela.

The project area rises in elevation from c. 1,900 ft AMSL (above mean sea level) along its seaward (north) end to c. 2,180 ft AMSL along its inland (south) end and contains three named hills: Na Pua, Puu Haole, and Puu Lili. Terrain within the project area is undulating and consists of two classifications of soil—Puu Pa silt loam, (12-20% slopes) and Puu Pa extremely stony very fine sandy loam (70-100% slopes), both representing the Puu Pa series of well drained silt loam and stony very fine sandy loam that formed in volcanic ash (Sato et al. 1973). The Puu Pa silt loam overlies weathering trachyte, which is present at 1.22 m (48 inches) below surface. The Puu Pa extremely stony very fine sandy loam is present on severely eroded land mostly containing only a thin soil layer over weathering trachyte (Sato et al. 1973). The Puu Pa extremely stony very fine sandy loam is present virtually throughout the entire project area in areas of rolling hills and knolls. The Puu Pa silt loam is generally confined to the lower swale areas surrounding Puu Haole.

Virtually the entire project area appears to have been mechanically modified. Modifications generally appear to have been confined to the level soil areas and to have consisted of cultivating the land for farm crops such as corn (Mr. R. Keakealani, pers. comm., September 8, 1989). According to Mr. R. Keakealani, the cultivation of farm crops generally occurred during the early 1900s. Subsequently, about the 1940s, the majority of the project area was again plowed and turned into pastureland. Presently, the entire project area is used for cattle pasture.

Rainfall in the general vicinity of the project area ranges between 20-30 inches per year (Armstrong 1983:63), and the mean annual temperature in the project area is approximately 70-75 degrees F. Vegetation in the project area consists primarily of a dense ground cover of various grasses and scattered trees, including silver oak (*Grevillea robusta* A. Cunn.), *wiliwili* (*Erythrina sandwicensis* [Degener, synonym, *E. monosperma* Gaud.]), and *kiawe* (*Prosopis pallida* [Humb. and Bonpl. ex Willd.] HBK). Also noted were scattered specimens of indigo (*Indigofera suffruticosa* Mill.) and lantana (*Lantana camara* L.).

## PREVIOUS ARCHAEOLOGICAL WORK

The present survey comprises the initial archaeological work conducted within the Royal Vistas Estates Development project area. Prior archaeological work conducted within the Land of Puuanahulu includes survey and testing by Barrera (1980), Haun (1986), and Walker and Rosendahl (1989); surveys by Reinecke (n.d.), Cordy (1981), and Rosendahl (1973); excavations by Emory et al. (1959), and inventory of sites by Emory (1970), recording of petroglyphs by Cox and Stasack (1970), a field inspection by Rosendahl (1989), and limited historical documentary research by Smith (1989). With the exception of Haun's (1986) work in the interior plateau (Pohakuloa Training Area), all archaeological work previously conducted within the Land of Puuanahulu is concentrated on the coast.

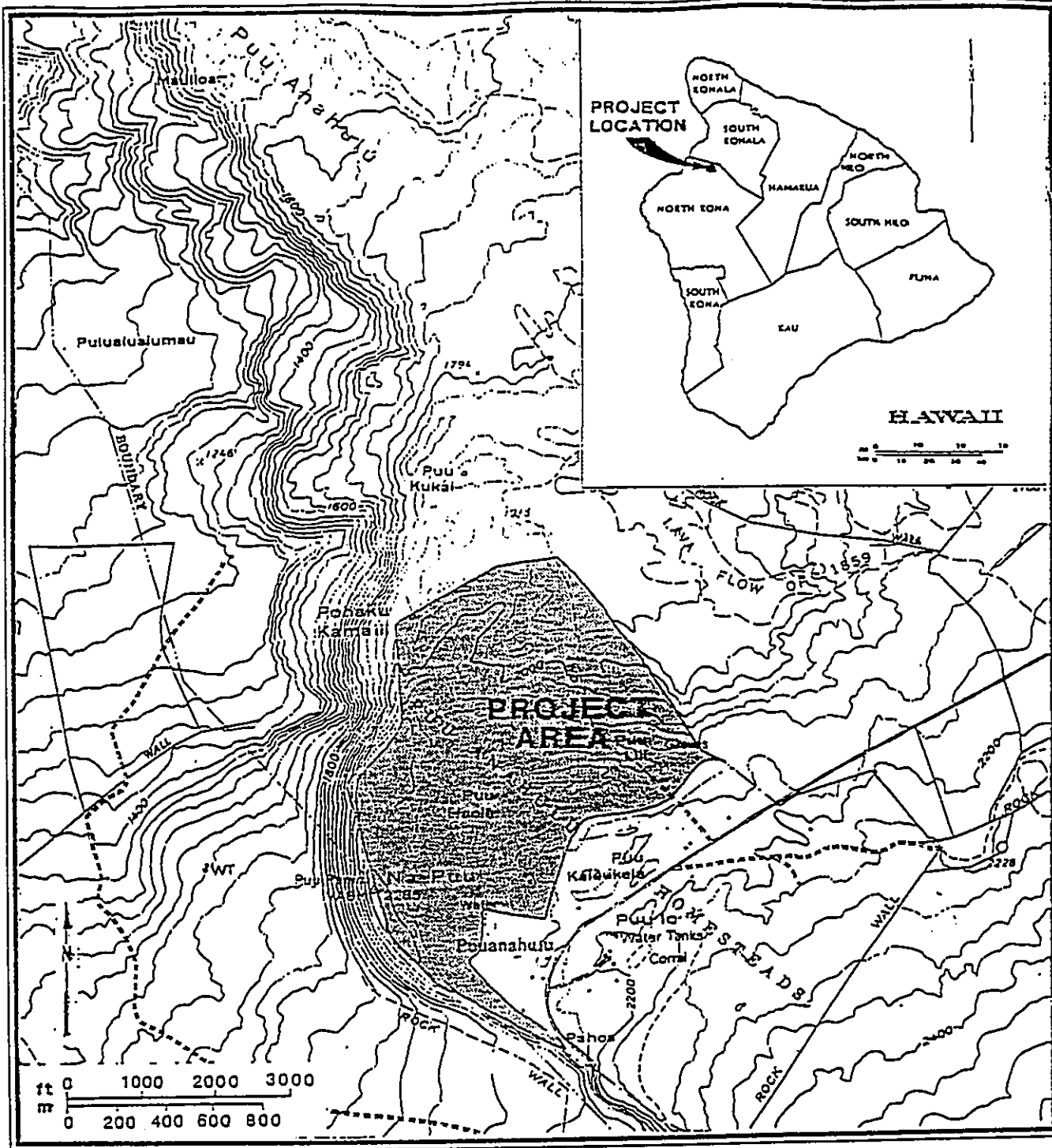
## LIMITED HISTORICAL DOCUMENTARY RESEARCH

by Helen Wong Smith, B.A.

A search through readily available historical documents yielded only a few minor references to Pu'uanahulu *ahupuaa*. Pu'uanahulu is listed in Pukui's *Place Names of Hawaii* (1974), where it is literally translated as "ten-day hill." Pukui indicates there are other possible translations: the name may be linked to the supernatural dog named Anahulu who was turned to stone by Pele; the stone is said to rest in a sea pool near the point known as Kalaeoka'ilio. The name could also be in relation to Anahulu, who in some accounts is mentioned as being a priestess.

Pu'uanahulu is mentioned in the following legend found in Maguire (1966). The short descriptive piece that follows the legend provides some insight into former land use in the general area:

Moemoe, prophet commanded by Pele saved the people of Napuu (The Hills), meaning Puuanahulu and Puuwaawaa from a shark-god who devoured the people of the area whenever they went to the ocean to fish or gather shellfoods. In his human form, the shark-god lived at Puaka-hale at Puuanahulu. Moemoe, who was a *kukini makanipuahiohioi* (a whirlwind runner) had the honor of a hill in the area named after him. One day while resting on this hill, he heard voices coming from the beach. He found at the beach a large



**Figure 1. PROJECT LOCATION MAP**  
**ARCHAEOLOGICAL FIELD INSPECTION**  
**ROYAL VISTAS ESTATES DEVELOPMENT PROJECT AREA**  
*Land of Puuanahulu*  
*North Kona District, Island of Hawaii*  
 PHRI Project 89-659      September 1989

gathering who watched a game of konane (Hawaiian checkers played on a stone checker-board with shells) being played by Iwahaonou, the shark-god in his human form. Iwahaonou challenged Moemoe to a game of konane and Moe replied with challenges of his own and insults referring to the diriness of Iwahaonou. Iwahaonou said he would go down to the ocean to bathe himself before the games began between him and Moemoe. Moemoe knew that Iwahaonou was really going down to devour more people to build up strength. While he was gone, Moemoe informed the people that this was the shark-god that had been devouring their friends and families. He instructed the people to build an imu large enough to bake the shark-god. When Iwahaonou returned, he was captured and thrown into the imu by the relatives of his latest victims.

This land of Napuu was well populated in ages past, and it was largely cultivated for the Alii Keawe-Nui-a Umi (Great King Keawe, son of Umi). Ehu was appointed Chief of this area, and due to Ehu's peaceful governing here, the saying has been celebrated in songs descriptive of Kona which has been handed down to the present day as "Kona I ka La'i a Ehu." (Kona in the Calm of Ehu); also "Kona Kaimalino a Ehu," (Kona of the Smooth Sea of Ehu) (Maguire 1966).

Another reference to land use in Pu'uuanahulu is found in Handy's Native Planters in Old Hawaii (1940):

"Doubtless potatoes were planted on the upland of North Kona, on the lower slopes of Hualalai toward Pu'u Wa'awa'a, up to a considerable altitude in rainy seasons. In recent times the flatlands of Pu'u Anahulu, having an elevation of about 2,300 feet, have supported a number of patches planted by Hawaiian cowboys."

#### Informant Interview

On September 8, 1989 the author and PHRI Supervisory Archaeologist Alan T. Walker escorted Mr. Robert Keakealani and his daughter Leina'ala Lightner to the project area. The project area is situated on the flanks of what is known informally as "Na Puu" or "The Hills." Mr. Keakealani is very familiar with the area—his family once homesteaded within it, and he worked for Puu Waa Waa Ranch (which the project area is part of) from the age of 14. According to Mr. Keakealani, at the turn of the century the area was homesteaded by several Hawaiian families. Mr. Keakealani's tenure on the ranch extended from 1932 to 1983.

During the field trip, Mr. Keakealani pointed out archaeological sites he knew of within and proximate to the project area and provided information on them. Site 13161, on Puu Lili, consists of Mr. Keakealani's family graves. Four members of the Keakealani family, including Robert's grandfather, Kailihiwa, are buried there. Near Site 13161 is a cave with an opening that was covered during the mid-1940s. Site 13162 is a rock platform abutting the northeast boundary of the project area. Mr. Keakealani identified the platform as "Kumua Heiau," adding that the whole area surrounding the heiau (which he referred to as a "paddock") was also known generally as "Kumua." (It should be noted here that it is possible that the heiau had another name which has since been lost). In conjunction with the present research, two State Survey Office maps were consulted, including one by Lobenstein of an 1897 survey (Register #1877). One the Lobenstein map, Site 13162 is not shown.

Site 13163 is a waterhole situated north of Site 13162, outside the project area. According to Mr. Keakealani, the area around the waterhole is called "Panika" because Black Angus calves were raised in the area ("Pa", with a macron over the "a" means fence, wall, or enclosure; "Nika" means black or blackened). The waterhole was covered with rocks which were easily removed, and the water was evident in the hole. Mr. Keakealani said that his grandmother and mother would come to this waterhole to acquire fresh water. When the tide was high at Kapaakea, the level of water in the hole would rise substantially. North of the waterhole, near a cluster of kiawe trees, is a house site. Near the house site, carved into pahoehoe, is a papamu board (for the game of konane).

Site 13164, another waterhole, is situated near Site 13161. Mr. Keakealani said that the general area of the site consisted of his Uncle Kiloana's pasture; near the site, peach and plum trees once grew in abundance, and in the general vicinity of the site fruit orchards once flourished. On Lobenstein's map, Site 13164 is labelled "Kumu's Waterhole."

Site 13165 is the Alapa'i family cemetery, situated on a pu'u. Eight members of the family are buried in the cemetery. Ma uka of the pu'u is Site 13166, the former site of the Alapa'i's house. Mr. Keakealani said that he "thought" that Grandpa Alapa'i was buried near the house; between the burial and house site, in a level area, corn was grown.

Site 13167 is the cistern for the former house of Eben P. Low, who was the first owner and manager of Puu Waa Waa Ranch. His sister, Hannah, married Robert Hind, who later took over the ranch. During the present field trip it was observed that there is a sign reading "Makaai" on the gate at



the boundary between Low's parcel and a parcel belonging to a Mr. Sam Puhi. There was also a fence line on the ma kai side of Mr. Puhi's parcel which Mr. Keakealani said was for keeping pigs out of the corn fields. On the Lobenstein map M. Puhi, ancestor of Sam, is listed as owner of the parcel.

Ma uka of Low's parcel is Site 13168, the Levi family cemetery where four people are buried. Mr. Keakealani did not know of any native landholder who held the parcel, only that it was held by a hapa ha'ole family named Levy. On Lobenstein's map, Levy's parcel is shown as Grant 6154 to L. Manu. Site 13171 is the house site of the Levy's.

South of Eben Low's property is what is called the Haai paddock, where Site 13169, a cemetery, is located. This cemetery is fenced, and although Mr. Keakealani said he knew of two people buried there, the size of the fenced area suggests a larger number of burials. The Lobenstein map shows the general area of the paddock as granted to H. Haiha (11.02 acres), and also depicts a government road bounding the Haai parcel. According to Mr. Keakealani, there were once WWII fox holes and fallout shelters near the stone wall that parallels the government road.

The map by Lobenstein lists twelve Grant parcels within the project area. According to Mr. Keakealani, about that time subsistence crops were cultivated by homesteaders in the area. Aside from the Lobenstein map, a map by G.F. Wright (Reg. #2633 n.d.) was consulted. This map outlines the homestead area and offers no more information other than the route of the Old Government Road within the area.

Concerning Puu Waa Waa Ranch, Mr. Keakealani recalled that the ranch primarily cultivated corn used for fodder within the present project area. The bulk of the cattle were kept on ranch land ma uka of the present project area. In addition to feeding their own cattle, three to five tons of corn were sent to Oahu each year. In the ranch's heyday there were 15,000 head of cattle on 40,000 acres of land. Puu Waa Waa was the second largest ranch on the island, next to Parker Ranch. Following the Hind's ownership of Puu Waa Waa Ranch, the Dillingham family took over. Their caretakers were the Carlsmiths. Leina'ala Lightner indicated that these were the "good years." The cowboys would meet their families down at Kiholo and spend the weekends there, picnicking often on beef given by the ranch. The ranch would allow the families to hunt for game birds on the land. During our tour of the project area, wild turkeys were still running around, as were Franklins. During the mid-1970s, the ranch was purchased by a Mr. Bonet. Today the ranch employs three full-time cowboys.

As mentioned previously, readily available historical information on Pu'uuanahulu ahupua'a is very limited. What information there is, however, indicates that the area was inhabited during both ancient and historic times. It is recommended that further historical documentary research be conducted on the ahupua'a. The research should include Boundary Commission testimonies, Hawaiian newspaper articles, and extensive informant interviews with kama'aina of the ahupua'a.

## FIELD METHODS AND PROCEDURES

On August 23, 1989, PHRI Supervisory Archaeologist Alan T. Walker and PHRI Field Archaeologist Jack Harris conducted a 100% aerial survey of the project area using a helicopter chartered from Papillon Helicopters and piloted by a Papillon Helicopters pilot. The purpose of the aerial survey was to (a) identify and plot visible archaeological sites, and (b) identify areas devoid of sites. For orientation, the archaeologists first flew over the boundaries of the entire project area. Next, the entire project area was examined by way of a series of overlapping aerial sweeps oriented northeast-southwest. Sweeps averaged 10-25 m above ground, depending on terrain, vegetation, and proximity of residential housing. Visibility in areas of grass cover (cattle pasture) and lightly forested areas was fair to good. The aerial reconnaissance identified two sites. Sites were assigned a sequential number designation beginning with "1" and prefixed by "AS-" (Aerial Survey) and were recorded in a field notebook (e.g., AS-1). Later, sites with "AS-" numbers were reassigned PHRI temporary numbers (prefixed by "659-"). All sites identified aurally were plouted on an 1"=400' scale aerial photograph (R.M. Towill Corp., Photo No. 7724-2).

The surface survey was conducted on September 8, 1989 by Mr. Walker and PHRI Field Archaeologists Robert Noah and Richard Sullivan. Accompanying the survey team were Ms. Helen Wong Smith, PHRI historical researcher, Mr. Robert Keakealani, a longtime kama'aina of Puuanahulu, and Mr. Keakealani's daughter, Leinaala Lightner. Mr. Keakealani and Ms. Lightner directed the survey field crew to known archaeological sites and provided valuable background information on the sites and the present project area.

Based on the findings of the aerial reconnaissance survey and on informant interviews with Mr. Keakealani and Ms. Lightner, it was determined that the majority of the project area had been converted to pastureland by ranching activities and that extensive pedestrian surface survey would

reveal little, if any, prehistoric archaeological sites. Subsequently, a variable-coverage pedestrian and vehicular survey was conducted (see Figure 2, Survey Coverage Map). As sites were identified they were assigned PHRI sequential temporary numbers prefixed by "659-", beginning with 659-1. Subsequently, all identified sites were assigned State Inventory of Historic Places (SIHP) permanent site numbers. All sites were plotted on the previously mentioned aerial photograph prepared by R.M. Towill (Photo No. 7724-2) and site notes were listed in a field notebook.

Selected sites (Sites 13162 and 13164) were then recorded on standard PHRI site record forms and were sketch-mapped, with orientation and site dimensions determined using metric tape and compass. At least one 35 mm black-and-white photograph was taken of selected sites and the general project area (PHRI Roll No. 1222).

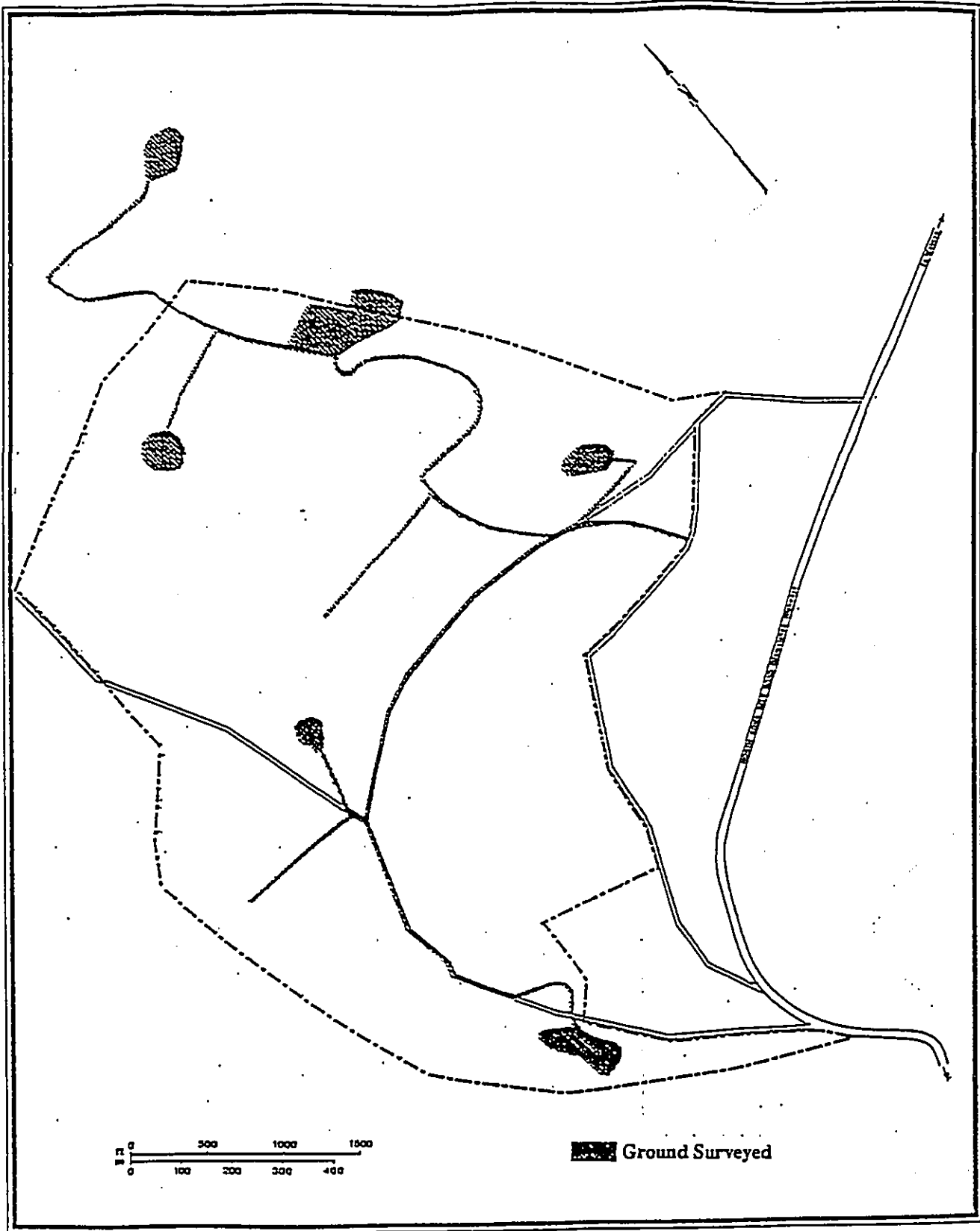


Figure 2. SURVEY COVERAGE MAP

## FINDINGS

During the present field inspection, 11 sites were identified within or immediately adjacent to the project area. Figure 3 shows the locations of all identified sites. Table 1 provides summaries for identified sites in terms of site numbers, formal type, functional type, CRM (Cultural Resource Management) value mode assessments, recommended field work tasks, and individual site comments.

Formal types identified within the project area include terrace, boulder mound, enclosure, boulder alignment, modified outcrop, box C-shape, cistern, and possible cultural deposit. Probable functional interpretations were determined for most features. Functional types encountered include habitation, burial, water catchment, ceremonial, and indeterminate.

Table 1.

### SUMMARY OF IDENTIFIED SITES AND FEATURES

*Site No.	Formal Site/Feature Type	Tentative Functional Interpretation	#CRM Value Mode Assess.			+Field Work Tasks			Comments
			R	I	C	DR	SC	EX	
13161	Boulder alignments	Burial	M	L	H	+	-	-	Identified by R. Keakealani as family cemetery; approx. nine individuals present; area delineated by old fence line.
13162	Terrace	Ceremonial- poss. burial	M/HM/HM/H			+	-	+	Identified as Kumua Heiau; possible burial in structure.
13163	Modified outcrop	Fresh water source	M	M	M/H	+	-	+	Water in bedrock cavity covered with boulders; house site and <u>papamu</u> identified by R. Keakealani north of site.

\* State Inventory of Historic Places (SIHP) site numbers. SIHP numbers are five-digit numbers prefixed by 50-10-20- (50=State of Hawaii; 10=Island of Hawaii; 20=USGS 7.5" series quad map ["Puu Anahulu, Hawaii"]).

# Cultural Resource Management

Value Mode Assessment-----Nature: R = scientific research  
I = interpretive  
C = cultural  
--Degree: H = high  
M = moderate  
L = low.

+ Field Work Tasks: DR = detailed recording (scaled drawings, photographs, and written descriptions),  
SC = surface collections,  
EX = test excavations.

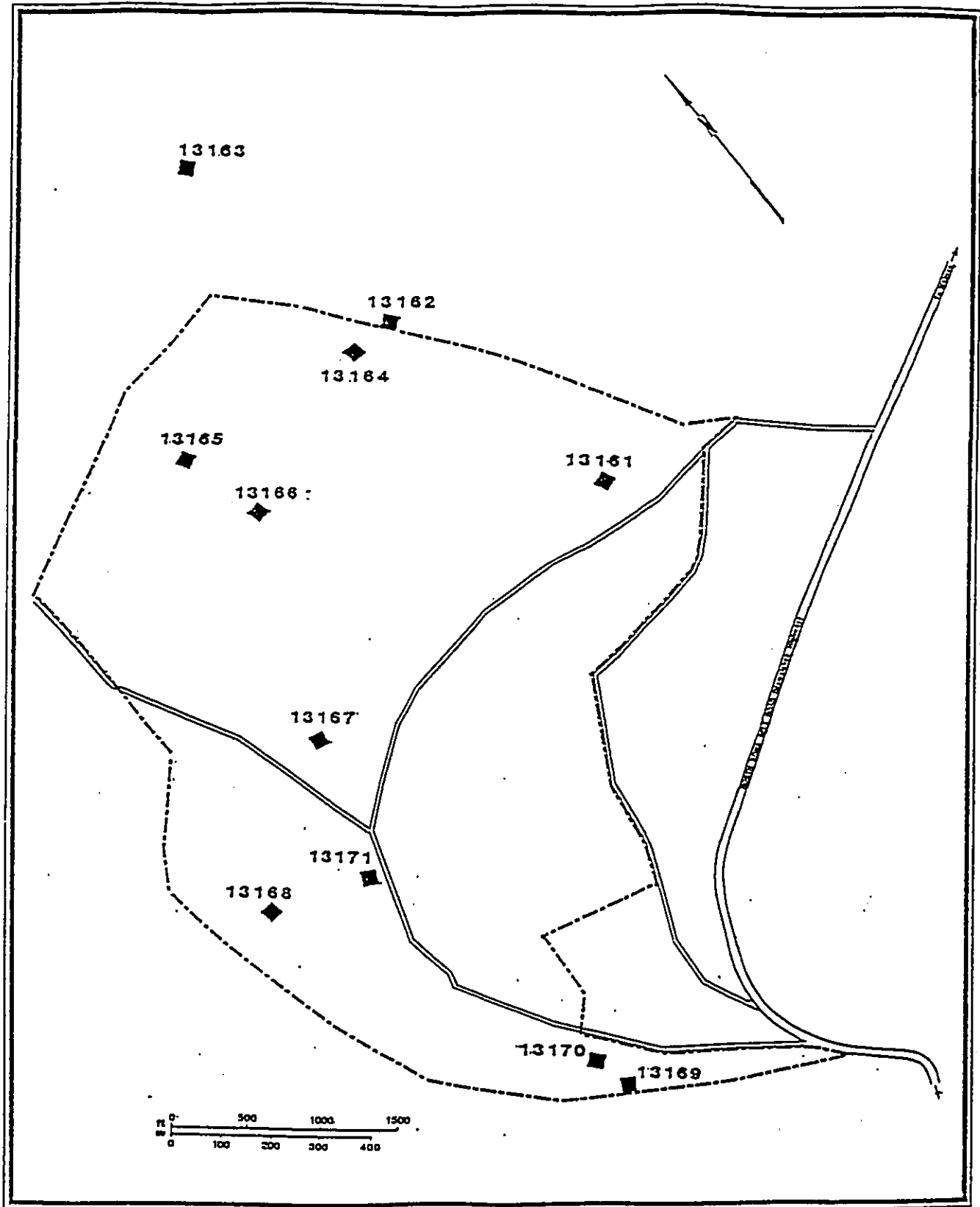


Figure 3. PROJECT AREA AND SITE LOCATION MAP

Table 1. (cont.)

Site No.	Formal Site/Feature Type	Tentative Functional Interpretation	CRM Value Mode Assess.			Field Work Tasks			Comments
			R	I	C	DR	SC	EX	
13164	Box C-shape	Habitation	M	L	L	+	-	+	Second water source identified northeast of site, however, no water present; area of bulldozed cave identified by R. Keakealani to southwest of site.
13165	Boulder mounds	Burial	M	L	H	+	-	-	Identified as Alapai family cemetery; approx. eight individuals present.
13166	Possible cultural deposit	Habitation-poss. burial	L/H	L	L/H	+	-	+	Identified as area of Alapai house site by R. Keakealani; also indicated one burial possibly present.
13167	Cistern-poss. cultural deposit	Water catchment-poss. house site	M	L	L	+	-	+	Eben Low family house site; adjacent cistern.
13168	Enclosure	Burial	M	L	H	+	-	-	Enclosure consists of wooden posts and wire; cemetery contains approx. four individuals.
13169	Enclosure	Burial	M	L	H	+	-	-	Enclosure consists of wooden posts and wire; cemetery contains unknown number of individuals.
13170	Enclosure	Indeterminate	M	L	L	+	-	+	Rock wall enclosure possibly associated with ranching period; nearby boulder alignment foundation for farm shed identified by R. Keakealani.
13171	Possible cultural deposit	Habitation	M	L	L	+	-	+	Identified as area of house site by R. Keakealani.

## CONCLUSION

### DISCUSSION

The informant interview with Mr. Robert Keakealani and the aerial survey indicated that the present project area had been extensively modified during the historic period. Modifications consisted of cultivating the land and improving it for pasture (cattle). Given the modifications, it is not surprising that there are only a few archaeological sites in the area, and that these sites generally reflect early-historic period occupation and exploitation. Only three sites may be prehistoric—13162, 13163, and 13164. Two sites (13162 and 13163) are situated outside the present project area; they are included in this survey because development of the Royal Vistas Estates may affect them negatively. Four sites (13161, 13165, 13168, and 13169) consist of family cemeteries. Direct lineal descendants (Keakealani family) have been identified for one of the cemeteries (Site 13161); families for the remaining three cemeteries have been named, but at present are not confirmed. According to informant testimony, Site 13166 may contain a burial.

No trails were identified within the present project area. According to Mr. Keakealani, however, movement between Puuanahulu and coastal areas during the early historic period took place along established routes.

### GENERAL SIGNIFICANCE ASSESSMENTS AND RECOMMENDED GENERAL TREATMENTS

General significance assessments and recommended general treatments for all identified sites are summarized in Table 2. Significance categories used in the site evaluation process are based on the National Register criteria for evaluation, as outlined in the Code of Federal Regulations (36 CFR Part 60). The DLNR-HSS/State Historic Preservation Office (SHPO) uses these criteria for evaluating cultural resources. Sites determined to be potentially significant for information content fall under Criterion D, which defines significant resources as ones which "...have yielded, or may be likely to yield, information important in prehistory or history." Sites potentially significant as representative examples of site types are evaluated under Criterion C, which defines significant resources as those which "...embody the distinctive characteristics of a type, period, or method of construction...or that represent a significant and distinguishable entity whose components may lack individual distinction."

Sites with potential cultural significance are evaluated under guidelines prepared by the Advisory Council on Historic Preservation (ACHP) entitled "Guidelines for Consideration of Traditional Cultural Values in Historic Preservation Review" (ACHP Draft Report, August 1985). The guidelines define cultural value as "...the contribution made by an historic property to an ongoing society or cultural system. A traditional cultural value is a cultural value that has historical depth." The guidelines further specify that "[a] property need not have been in consistent use since antiquity by a cultural system in order to have traditional cultural value."

Based on the above federal criteria, four of the 11 sites (36.4% of total sites) are assessed as significant solely for information content (Sites 13164, 13167, 13170, and 13171). Further data collection is recommended for all four sites. After further data collection is completed, if warranted, a data recovery plan should be prepared and implemented for sites not recommended for preservation or interpretation.

Four (36.4%) of the remaining seven sites (63.6%) are assessed as culturally significant and valuable for information content (Sites 13161, 13165, 13168, and 13169). These four sites have been identified as family cemeteries and contain human burial remains. For these four sites, further data collection (detailed recording only) is recommended.

One site (13166) is assessed as significant for information content and is tentatively evaluated as culturally significant. This site may contain a burial; further data collection is recommended for it, and preservation "as is" is tentatively recommended, pending data collection results.

The final two sites (Sites 13162 and 13163) are assessed as significant for information content, cultural value, and as excellent examples of site types. These two sites are situated outside of the project area. Because they are situated near the project area boundary and may be adversely affected by future development, further data collection is recommended for them to be followed by preservation "as is."

In all the above cases, further data collection should minimally consist of detailed recording and test excavations to the level of a full inventory survey.

To further facilitate management decisions regarding the subsequent treatment of resources, the general significance

Table 2.

**SUMMARY OF GENERAL SIGNIFICANCE ASSESSMENTS  
AND RECOMMENDED GENERAL TREATMENTS**

Site Number 50-10-20-	Significance Category				Recommended Treatment			
	A	X	B	C	FDC	NFW	PID	PAI
13164	+	-	-	-	+	-	-	-
13167	+	-	-	-	+	-	-	-
13170	+	-	-	-	+	-	-	-
13171	+	-	-	-	+	-	-	-
<b>Subtotal:</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>
13161	+	-	-	+	+	-	-	+
13165	+	-	-	+	+	-	-	+
13168	+	-	-	+	+	-	-	+
13169	+	-	-	+	+	-	-	+
<b>Subtotal:</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
13166	+	-	-	*	+	-	-	*
<b>Subtotal:</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>
13162	+	-	+	+	+	-	-	+
13163	+	-	+	+	+	-	-	+
<b>Subtotal:</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Total:</b>	<b>11</b>	<b>0</b>	<b>2</b>	<b>7</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>7</b>

\* *Provisional Assessment; definite assessment pending results of further data collection.*

**General Significance Categories:**

- A = Important for information content, further data collection necessary (PHRI=research value);
- X = Important for information content, no further data collection necessary (PHRI=research value, SHPO=not significant);
- B = Excellent example of site type at local, region, island, State, or National level (PHRI=interpretive value); and
- C = Culturally significant (PHRI=cultural value).

**Recommended General Treatments:**

- FDC = Further data collection necessary (intensive survey and testing, and possibly subsequent data recovery/mitigation excavations);
- NFW = No further work of any kind necessary, sufficient data collected, archaeological clearance recommended, no preservation potential (possible inclusion into landscaping suggested for consideration);
- PID = Preservation with some level of interpretive development recommended (including appropriate related data recovery work); and
- PAI = Preservation "as is," with no further work (and possible inclusion into landscaping), or minimal further data collection necessary.



of the archaeological resources identified during the present survey were also evaluated in terms of potential scientific research, interpretive, and/or cultural values (Cultural Resource Management [CRM] Value Modes; see Table 1 for individual assessments of sites). Research value, refers to the potential of archaeological resources for producing information useful in the understanding of culture history, past lifeways, and cultural processes at the local, regional, and interregional levels of organization. Interpretive value refers to the potential of archaeological resources for public education and recreation. Cultural value, within the framework for significance evaluation used here, refers to the potential of archaeological resources for the preservation and promotion of cultural and ethnic identity and values.

Regarding the burials and possible burials identified within the project area, if they are not preserved "as is," it is required the procedures of Section 43 of Chapter 6E (Historic Preservation, Haw. Rev. Stat., as amended) be followed. The DLNR-HSS/SHPO should be notified and will contact the Office of Hawaiian Affairs (OHA). A mitigation plan for burials, with osteological analyses, should be worked out with DLNR-HSS/SHPO. At least, a search for direct lineal descendants—consisting of publishing in a newspaper of general circulation a public notice to notify possible direct lineal descendants—should be conducted. If direct lineal descendants are found, the osteological analyses shall be subject to their wishes. Lastly, a plan for final disposition of the remains should be developed in accordance with Section 43 of Chapter 6E. It is recommended that any remains found be reinterred either within the project area. If this is not possible, they should be reinterred in a nearby cemetery. A disinterment permit may be required from the State Department of Health.

As an important initial step prior to data collection, it is recommended that all identified sites be accurately located and plotted by professional surveyors, with the aid of an archaeologist, on an appropriate scale topographic map of the project area. This would greatly aid development planning by allowing further archaeological work determinations (further data collection, data recovery and/or preservation) to be more accurately considered on a site-by-site basis.

Finally, in conjunction with the further data collection to be conducted at sites in the project area it is recommended that additional background historical documentary research, including extensive informant interviews, be conducted.

The above tentative evaluations and recommendations were discussed with Dr. Ross Cordy (September 13, 1989) and with Ms. Virginia Goldstein (September 14, 1989). Dr. Cordy and Ms. Goldstein are currently reviewing the conclusions and recommendations presented here regarding further archaeological work to be conducted within the proposed Royal Vistas Estates Development project area.

It should be noted that the evaluations and recommendations presented within this report have been based on limited informant interviews and a 100% aerial and variable-coverage pedestrian and vehicular survey of the project area. There is always the possibility, however remote, that potentially significant, unidentified subsurface cultural remains will be encountered in the course of future archaeological investigations or subsequent development activities. In such situations, archaeological consultation should be sought immediately.

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MAR 12 1990

*PREMIER RESORT DEVELOPMENT, INC.*  
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March 8, 1990

Mr. Duane Kanuha, Director  
Planning Department  
COUNTY OF HAWAII  
25 Aupuni Street  
Hilo, HI 96720

Re: Royal Vista Estates and Country Club

Dear Mr. Kanuha:

We would like to take this means to thank you, your staff and the Planning Commission for the professional and fair consideration given to us on the subject project. The review and decision-making process took some time, but in the end, we believe that it turned out for the better. Relevant issues were raised and responded to, and added commitments to the community were made to further minimize any potential adverse impacts.

As noted above, we did make a number of commitments both the County and the immediate community, some of which were incorporated as conditions of approval to the Use Permit. Please be assured that we, as well as any potential successors or assigns of interest, have every intention of honoring these commitments. These commitments, inclusive of those already incorporated as conditions are:

- a. include a provision in the operation of the golf course and facility that would allow for an annual play for residents of the Puuanahulu community. The fare would be either complimentary or at a substantially reduced rate. This could be done in conjunction with a fundraising event sponsored by the residents.
- b. provide for an annual water subsidy of up to \$10,000 to the Puuwaawaa Water Works Company for a maximum 10-year period, beginning the anniversary date of the opening of the proposed golf course. Said subsidy shall be limited to all existing water users as of the effective date of this Use Permit and shall be divided equally among said users; provided, however, that in no event shall the subsidy exceed 50% of the user's annual cost.

EXHIBIT J

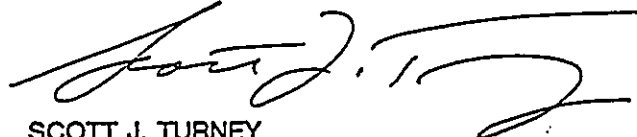
Mr. Duane Kanuha  
March 8, 1990  
Page 2

- c. in the event the amount of domestic or potable water currently available to all existing users (up to 600 gpd per user) from the private water system provided by the Puuwaawaa Water Works Company diminished due to the operation of the golf course and related activities, rectify or remedy the situation at its own expense.
- d. provide technical assistance to all interested landowners in the Puuanahulu area by preparing and submitting agriculture tax dedication applications prior to receipt of Final Plan Approval for the proposed golf course.
- e. notwithstanding the required amount as determined by Condition No. 4, provide a minimum of \$1 million in fiscal and/or improvement contribution or any combination thereof to the County of Hawaii for recreational activities. Said amount would be in partial or full fulfillment, whichever the case may be, of Condition No. 4 and would be payable in the manner identified by Condition No. 4.
- f. in the case of families desiring to retain their existing burial grounds on the site, provide for their retention as well as the necessary access easement (s) to the grounds.
- g. give preferential employment opportunities to existing and former residents of the area, as well as institute a job training program to enhance said individuals' employability and occupational mobility.

As in the past, we intend to continue working very closely with the community and, where appropriate, the affected government agencies in implementing this project and the foregoing representations. We believe that only through such interaction can we develop a project that can offer a multitude of private and public benefits.

Again, we thank all of you for your dedicated and unwavering sense of professionalism and fairness.

Sincerely,



SCOTT J. TURNEY  
President

cc: Planning Commission  
Mrs. Leinaala Keakealani-Leightner  
Sidney Fuke

TRAFFIC IMPACT ANALYSIS REPORT

ROYAL VISTA ESTATES

Prepared by:

M&E PACIFIC, INC.  
100 Pauahi Street, Suite 212  
Hilo, Hawaii 96720

October, 1989

EXHIBIT K

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TRAFFIC IMPACT ANALYSIS REPORT

ROYAL VISTA ESTATES

The Royal Vista Estates development is a proposed agricultural five-acre subdivision and championship golf course in North Kona, Hawaii. This report documents the results of a study conducted to evaluate the traffic impacts of the proposed development. The study included a review of existing traffic conditions, forecast of future traffic conditions, and analysis of the forecast volumes to determine the impact on the roadway system and need for any mitigating measures.

PROJECT DESCRIPTION

The project site is located in the Puuanahulu Homesteads area in North Kona and is approximately 415 acres in size.

The Royal Vista Estates development is proposed to include a 27-hole championship golf course designed by renown golf course architect, Pete Dye, with provisions for a clubhouse with locker/shower facilities, a gourmet restaurant, tennis courts, and a health and fitness facility. Surrounding the golf course will be 42-43 agricultural house lots of five-acre minimum size. Portions of the golf course will be integrated as part of the lots and would be designated by easements. The proposed project is expected to be completed in about two years.

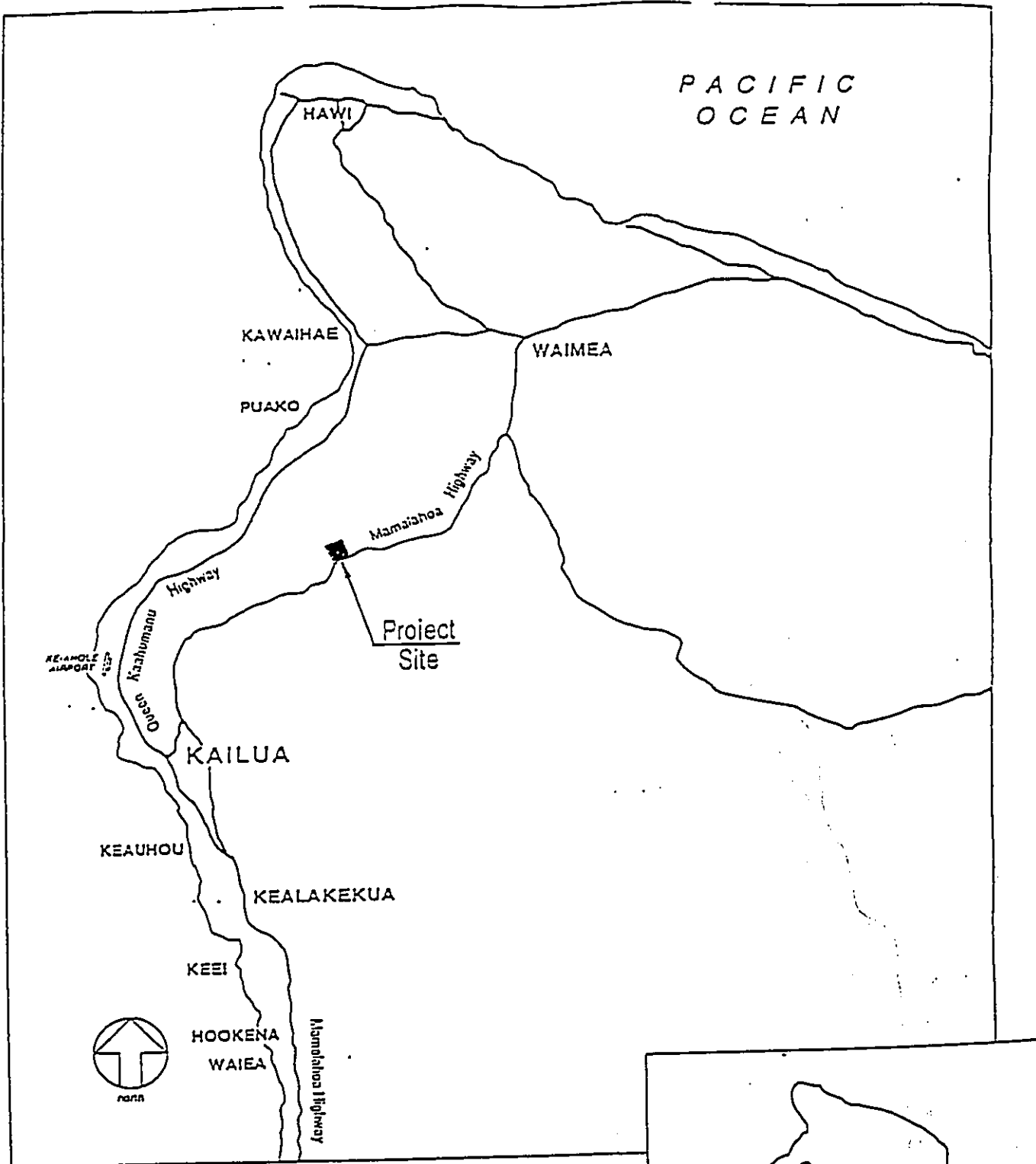


As shown on Figure 1, the project site is located makai of the Mamalahoa Highway (Route 190), a rural two-lane highway under the jurisdiction of the State Department of Transportation. The highway has a 24-foot pavement width and is posted for a 45 mile per hour speed limit and provides the mauka north-south access route through North Kona and South Kohala. The principal access to the project site from Mamalahoa Highway is proposed to be located approximately 1,800 feet north of the access to the Puu Lani Ranch Subdivision. As the highway is relatively straight at this location, the required entrance sight distances of the Hawaii Statewide Uniform Design Manual for Streets and Highways (October, 1980) of  $D_L = 635$  feet and  $D_R = 570$  feet are far exceeded (See Figure 2).

The project may eventually provide a second access to the Queen Kaahumanu Highway, the major north-south roadway in the region. It is a two-lane, Class I State Highway with limited access and 55 mile per hour posted speed. Due to the tentative nature of the latter connection, only the access to Mamalahoa Highway was analyzed in this study.

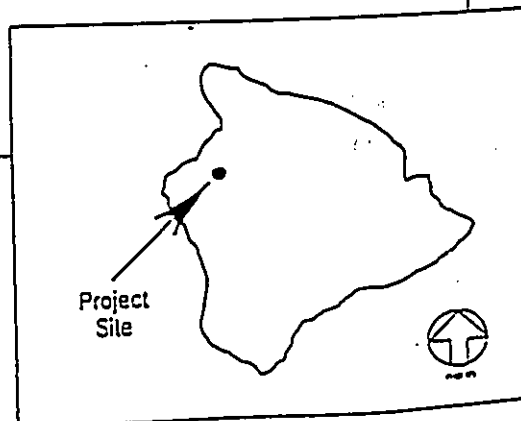
#### TRAFFIC VOLUMES

Traffic volume counts were taken on October 9, 1989, during the afternoon peak period at the entrance to the Puu Lani Ranch on Mamalahoa Highway. The site is across the highway from the project site, although the proposed access



LOCATION MAP

FIGURE 1



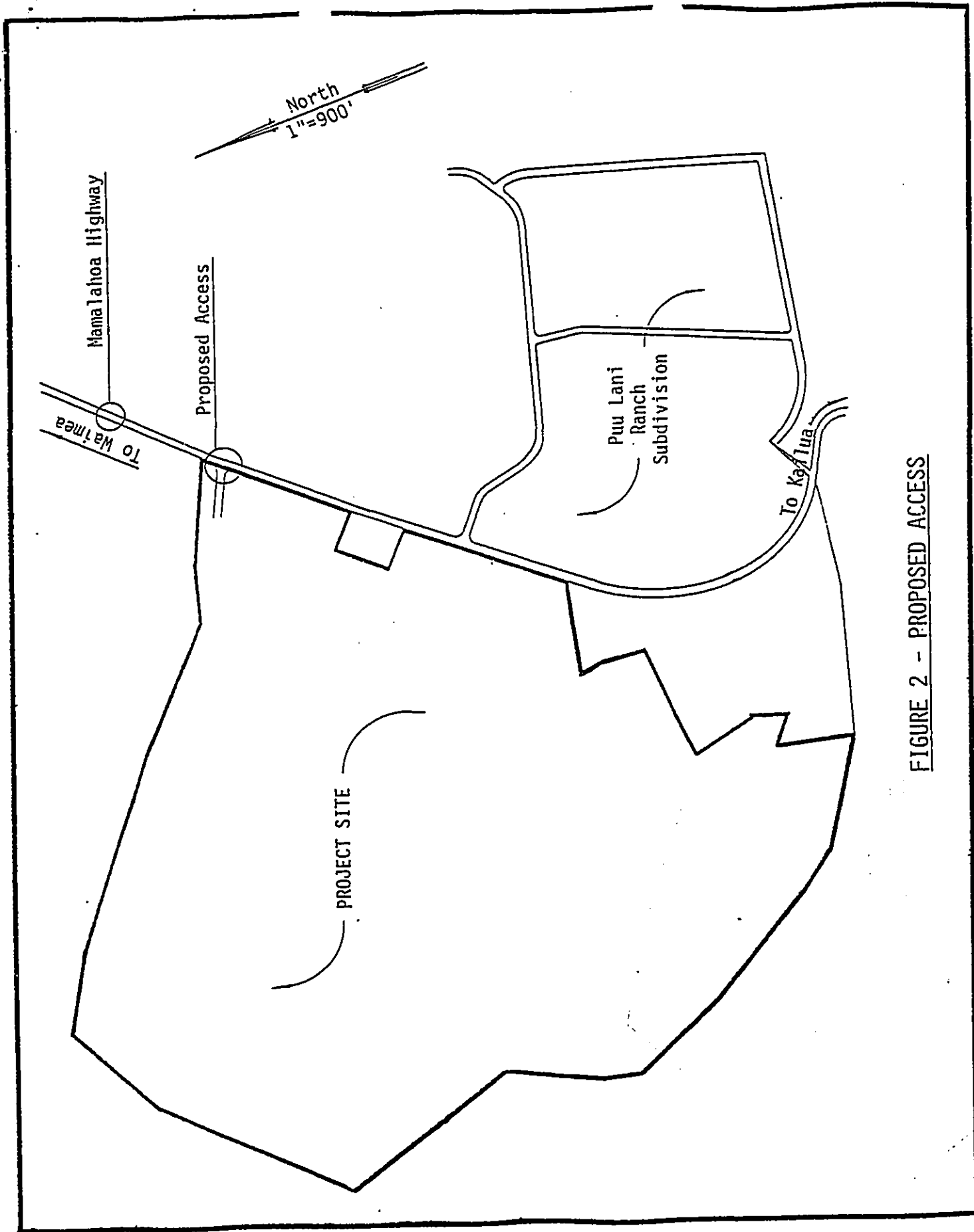


FIGURE 2 - PROPOSED ACCESS

would be located further north. The resulting peak hour (rounded) volumes compared to 1988 traffic counts taken by the State Department of Transportation at the Waikoloa Road intersection further to the north are as follows:

<u>Direction of Travel</u>	<u>M&amp;E Pacific 1989</u>	<u>SDOT 1988</u>
Southbound	95 vehicles	95 vehicles
Northbound	75 vehicles	30 vehicles

#### TRAFFIC FORECASTS

This study assumed that the proposed project would be completed and ready for operations in two years. Traffic volumes on Mamalahoa Highway can be expected to increase in the interim due to regional growth. The traffic which would be generated by the proposed project was added to the ambient traffic forecasts on Mamalahoa Highway to obtain the total forecast traffic at the new access road intersection. Only the PM peak was analyzed since the golf course is not expected to be a major generator in the AM peak.

Ambient traffic volumes on Mamalahoa Highway were forecast for 1991. The Ritz-Carlton Traffic Impact Report Study (1987) prepared by Belt Collins & Associates developed 1993 and 1998 PM peak hour traffic forecasts for several locations in North Kona and South Kohala, for several development scenarios. One set of forecasts was made for the intersection of Mamalahoa Highway and Lindsey Road (Kawaihae Road) in Kamuela. Their study showed PM peak directional

growth rates on the south approach (Mamalahoa Highway) from 1987 to 1993 of 2.2% per year southbound and 1.1% northbound, for their full development scenario. The worksheet from that report is shown in Appendix B of this report. When applied to the 1989 existing volumes mentioned above, the following results for 1991 were obtained:

	<u>Growth Rate</u>	<u>1991 Volumes</u>
Southbound	1.044	100
Northbound	1.022	75

The traditional procedure of trip generation, distribution, and assignment was used to estimate the number of vehicle trips which would be generated by the proposed project in the PM peak hour, the distribution of these trips, and the specific turning movements affected. For the purposes of this study, it was assumed that the 43 agricultural houselots would be occupied by single-family households and the golf course would require about 225 acres.

Trip generation rates for single-family dwelling units and golf courses were obtained from the ITE Trip Generation, (Third Edition, 1982). The rates and results are shown below:

<u>Land Use</u>	<u>Units</u>	<u>Rate</u>	<u>Trips</u>
Golf course	225 acres	.39 in & out	88 in & out
Homes	43 Dwelling Units	.63 in .37 out	27 in 16 out

The volume of trips forecast for the proposed 27 hole golf course is slightly higher than the 60 trips per hour

average noted for 18 hole, private courses. The golf course trips were further factored for 80% outbound and 20% inbound, to account for the majority of golf course patrons leaving during the PM peak period. Therefore, for the golf course and homes combined, there were a total of 88 outbound trips and 45 outbound peak hour trips.

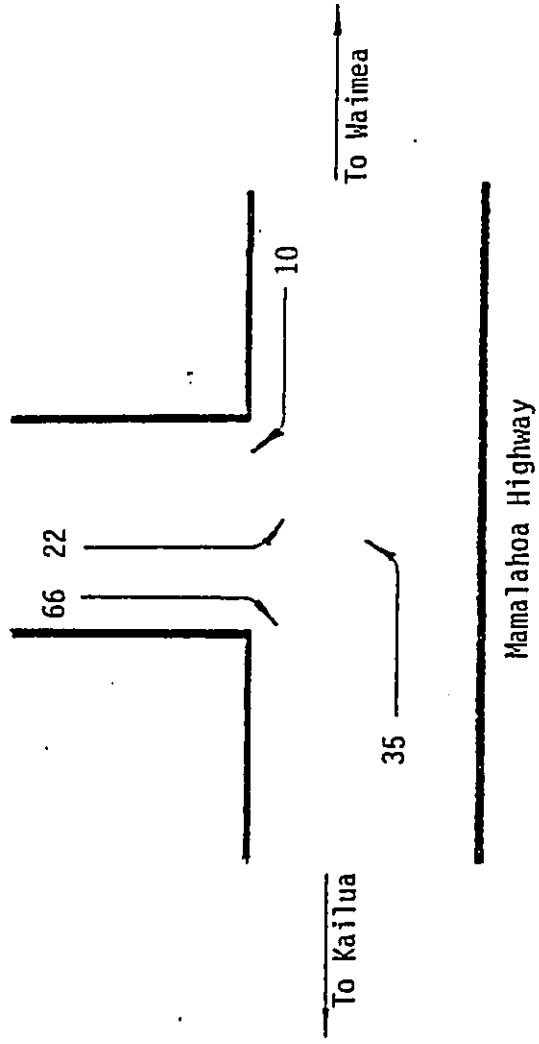
For trip distribution, it was assumed that 75% of the generated trips would be to/from the south (Kailua), and the remaining 25% to the north (Kamuela). The results of assigning these volumes to the specific turning movements at the access road intersection are shown on Figure 3. Although there may be trips between the homes and golf course, the conservative assumption was made that all the project generated trips would leave the project (and use Mamalahoa Highway) to show the maximum impact on the roadway.

The ambient through traffic volumes were added to the project generated volumes (Figure 3) to obtain the total forecast volumes on Figure 4.

#### TRAFFIC IMPACT ANALYSIS

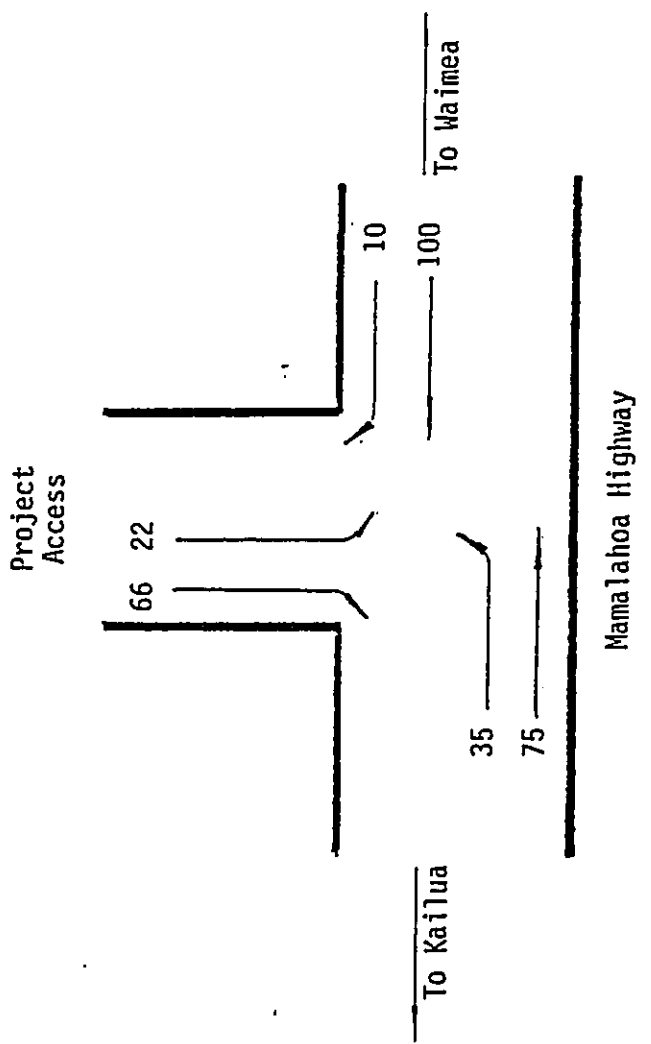
The total forecast traffic volumes from Figure 3 were analyzed using the TRB Highway Capacity Manual (1985) methodology for unsignalized intersections, described in Appendix A. The methodology yields levels of service for critical turning movements at the intersection. The results are summarized as follows:

Project  
Access



Project Generated Traffic

FIGURE 3



Total Forecast Traffic

FIGURE 4



<u>Direction</u>	<u>Level of Service</u>
Left turn into access road	A
Exit from access road	A

These results indicate very desirable traffic operating conditions and no traffic impacts as a result of the project. The forecast volumes of through and turning movements at the access intersection are very low. A single lane access road will be sufficient and a high-design intersection with separate turning lanes is not necessary if minimum sight distance requirements are met.

#### CONCLUSIONS

The proposed project is not expected to have a significant traffic impact on the local roadway system. A single-lane access road and simple intersection with the Mamalahoa Highway will be sufficient to meet the forecast traffic volumes.

A P P E N D I X A

ABSTRACT OF METHODOLOGY

for the

CAPACITY ANALYSIS FOR UNSIGNALIZED INTERSECTIONS

ABSTRACT FOR METHODOLOGY  
for the  
CAPACITY ANALYSIS OF UNSIGNALIZED INTERSECTIONS

This abstract summarizes the procedures for analyzing the capacities of unsignalized intersections. These procedures are described in the Highway Capacity Manual, Special Report 209 (1985) by the Transportation Research Board. This manual "is a collection of techniques for estimating highway capacity that have been judged, through consensus, as the best available at the time of publication." This manual does not set legal standards for highway design but the procedures have become widely accepted and used in the traffic engineering profession.

The capacity analysis procedure is based on a German method originally published in 1972 and translated in 1974, and modified for U. S. conditions by the TRB. It is intended for two-way STOP- and YIELD-controlled intersections and calculates the capacities of movements which cross or turn through the major traffic stream. The capacity of each movement is based on two factors: the gap distribution in conflicting traffic streams and the gap acceptance behavior of drivers at such intersections.

The basic steps in methodology are as follows:

- 1) Define intersection geometry and traffic volumes.
- 2) Determine the "conflicting conflicts" through which every minor street movement and major street left turn must cross.

- 3) Determine the size of the gap in the conflicting stream needed by vehicles in each movement crossing a conflicting traffic stream.
- 4) Determine the capacity of the gaps in the major traffic stream to accommodate each of the subject movements that will utilize these gaps.
- 5) Adjust the capacities to account for impedance and the use of shared lanes.

Tables and charts, as well as computer programs, have been developed to facilitate using this methodology.

#### INTERSECTION DATA

Key geometric factors include: number and use of lanes, channelization, percent grade, curb radii and approach angle, and sight distances. One hour volumes are specified by movement and converted to passenger cars per hour using the passenger car equivalents in TABLE 10-1.

#### CONFLICTING TRAFFIC

The conflicting movements each turning movement faces is summarized on Figure 10-2. The right turn movement from the minor street faces the least number of conflicting movements, the left turn movement from the minor street the most. Adjustments to the conflicting traffic volumes are shown on Figure 10-2.

#### CRITICAL GAP SIZE

"The 'critical gap' is defined as the median time headway between two successive vehicles in the major traffic stream that is accepted by drivers in a subject movement that must cross and/or emerge with the major street traffic." It is dependent upon a number of factors, including:

TABLE 10- PASSENGER-CAR EQUIVALENTS FOR UNSIGNALIZED INTERSECTIONS

TYPE OF VEHICLE	GRADE (%)				
	-4%	-2%	0%	+2%	+4%
Motorcycles	0.3	0.4	0.5	0.6	0.7
Passenger Cars	0.8	0.9	1.0	1.2	1.4
SU/RVs*	1.0	1.2	1.5	2.0	3.0
Combination Veh.	1.2	1.5	2.0	3.0	6.0
All Vehicles*	0.9	1.0	1.1	1.4	1.7

\* Single-unit trucks and recreational vehicles.  
 \*\* If vehicle composition is unknown, these values may be used as an approximation.

Subject Movement	Conflicting Traffic, $V_{ci}$	Illustration
1. RIGHT TURN from minor street.	$1/2(V_r)^{**} - V_r^*$	
2. LEFT TURN from major street.	$V_r^{***} + V_r^*$	
3. THROUGH MVT from minor street.	$1/2(V_{r2})^{***} + V_{t2} + V_{l2} + V_{rb} + V_{tb} + V_{lb}$	
4. LEFT TURN from minor street.	$1/2(V_{r2})^{***} + V_{t2} + V_{l2} + V_{rb}^{***} + V_{tb} + V_{lb} + V_o + V_{or}$	

- \*  $V_r$  includes only the volume in the right hand lane.
- \*\* Where a right-turn lane is provided on major street, eliminate  $V_r$  or  $V_{r2}$ .
- \*\*\* Where the right-turn radius into minor street is large and/or where these movements are STOP/YIELD-controlled, eliminate  $V_r$  (Case 2), and  $V_{r2}$  and/or  $V_{rb}$  (Case 4).  $V_{rb}$  may also be eliminated on multilane major streets.

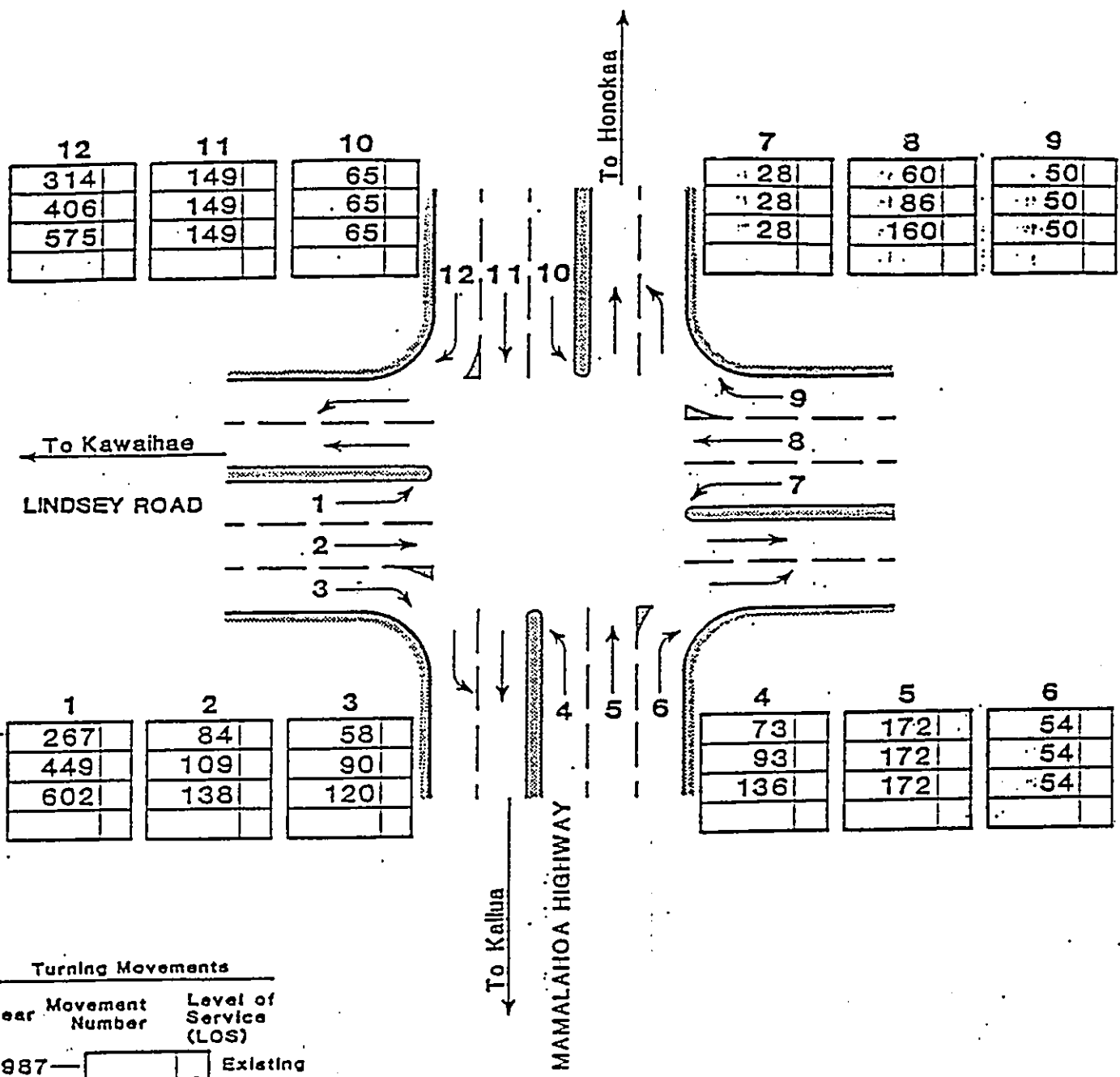
Figure 10-2. Definition and computation of conflicting traffic volumes.

A P P E N D I X B

Source:

BELT, COLLINS & ASSOCIATES

RITZ-CARLTON TRAFFIC IMPACT REPORT STUDY (1987)



**Turning Movements**

Year	Movement Number	Level of Service (LOS)
1987		Existing
1993		Scenario 3
1998		Scenario 6
2004		

**INTERSECTION 16  
PM PEAK HOUR VEHICLE  
TURNING MOVEMENTS**

Source:  
Belt, Collins & Associates,  
Ritz-Carlton Traffic Impact Report Study (1987)

- 1) The type of maneuver being executed.
- 2) STOP or YIELD sign control.
- 3) The average running speed on the major street.
- 4) The number of lanes on the major street.
- 5) The geometrics and environmental conditions at the intersection.

The value of the critical gap is selected from Table 10-2. The basic critical gap is selected and adjustments and modifications made.

#### POTENTIAL CAPACITY FOR MOVEMENT

"The potential capacity is defined as the 'ideal' capacity for a specific movement," and is selected from Figure 10-3. It is based on the conflicting traffic volume and the critical gap. The result is read in passenger cars per hour.

#### IMPEDANCE EFFECTS

The methodology assumes that vehicles use gaps at an unsignalized intersection in a prioritized manner. Thus, when traffic becomes congested in a high-priority movement, it can reduce the potential capacity of lower priority traffic movements. Given the priority of gap usage:

- 1) Left turn from the major street impede both through movements and left turns from the minor street.
- 2) Through movements from the minor streets impede left turns from the minor street.

The impact of impedance is addressed by multiplying the potential capacity of a movement by a series of impedance



TABLE 10-2. CRITICAL GAP CRITERIA FOR UNSIGNALIZED INTERSECTIONS

BASIC CRITICAL GAP FOR PASSENGER CARS, SEC				
VEHICLE MANEUVER AND TYPE OF CONTROL	AVERAGE RUNNING SPEED, MAJOR ROAD			
	30 MPH		55 MPH	
	NUMBER OF LANES ON MAJOR ROAD			
	2	4	2	4
RT from Minor Road				
STOP	5.5	5.5	6.5	6.5
YIELD	5.0	5.0	5.5	5.5
LT from Major Road	5.0	5.5	5.5	6.0
Cross Major Road				
STOP	6.0	6.5	7.5	8.0
YIELD	5.5	6.0	6.5	7.0
LT from Minor Road				
STOP	6.5	7.0	8.0	8.5
YIELD	6.0	6.5	7.0	7.5

ADJUSTMENTS AND MODIFICATIONS TO CRITICAL GAP, SEC	
CONDITION	ADJUSTMENT
RT from Minor Street: Curb radius > 50 ft or turn angle < 60°	-0.5
RT from Minor Street: Acceleration lane provided	-1.0
All movements: Population ≥ 250,000	-0.5
Restricted sight distance*	up to +1.0

NOTES: Maximum total decrease in critical gap = 1.0 sec.  
 Maximum Critical gap = 8.5 sec.  
 For values of average running speed between 30 and 55 mph, interpolate.  
 \* This adjustment is made for the specific movement impacted by restricted sight distance.

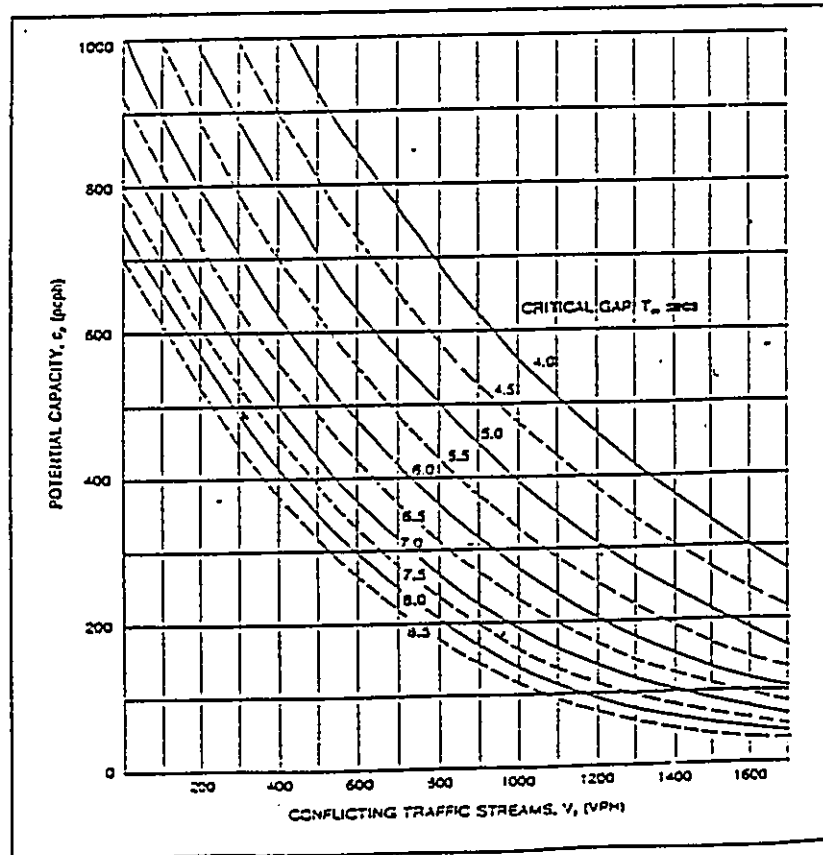


Figure 10-3. Potential capacity based on conflicting traffic volume and critical gap size.

factors for each higher priority impeding movement.

Impedance factors are derived using Figure 10-5.

#### SHARED LANE CAPACITY

The methodology has assumed to this point that each minor street movement has an exclusive lane. In reality, most minor street approaches have two or three movements sharing one lane. An equation is used to compute the capacity of the shared lane.

#### LEVEL OF SERVICE CRITERIA

The above computations yield a capacity solution for each lane on the minor street approaches and for left turn movements from the major streets. This figure is used to derive the reserve capacity, the difference between the capacity solution and the volume of traffic using the lane. Level of service criteria are stated in general terms for general ranges of reserve capacity and delay, as follows:

<u>Reserve Capacity</u>	<u>Level of Service</u>	<u>Expected Delay</u>
> 400	A	Little or no delay
300-399	B	Short traffic delays
200-299	C	Average traffic delays
100-199	D	Long traffic delays
0- 99	E	Very long traffic delays
a/	F	a/

---

a/ When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement to the intersection.

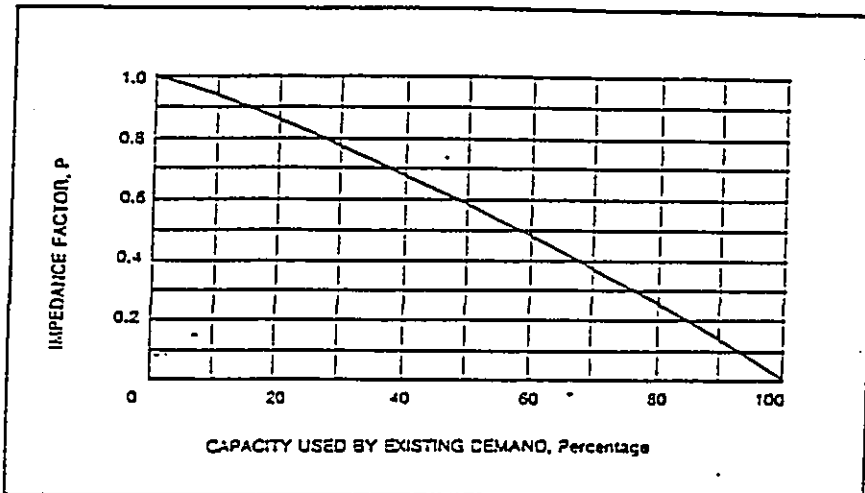


Figure 10-5. Impedance factors as a result of congested movements.

We, the undersigned, are landowners and/or residents of the Puuanahulu Community. We are aware of plans for a 27-hole golf course with related facilities and a proposed 5-acre lot subdivision by Premier Resort Development, Inc.

We do not object to this project, as the golf course will provide this area with perpetual open space. It will also result in an overall reduction in the total number of developable lots (based upon existing zoning) in this area. The developer has also given us assurance that our water supply will not be cut off or reduced by the Puuwaawa Water Works Company due to this development.

We also believe that should there be any increase in the number of lots within the golf course-area, it should come only by the downzoning of other properties in the area. This is so that the total number of developable lots, based upon existing zoning, would not be exceeded and, if anything, be reduced.

PRINTED NAME	SIGNATURE	ADDRESS	DATE
Bertha Alapai	<i>Bertha Alapai</i>	78-6615 Alii Pl	12-15-87
Lisa Connor-Miller	<i>Lisa Connor-Miller</i>	PO Box 4820	12/13/89
Lulu Miller	<i>S.P. Miller</i>		
<i>Mr. David L. Heikelani Sr.</i>	<i>David L. Heikelani Sr.</i>	Box 684-KK	96745
<i>Mr. Keanu K. Keakealani Sr.</i>	<i>Keanu K. Keakealani Sr.</i>	Manuela - HI	96743
<i>Chae N. Heikelani</i>	<i>Chae N. Heikelani</i>	1221 1546 Kanihale	96743

EXHIBIT L

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<u>PRINTED NAME</u>	<u>SIGNATURE</u>	<u>ADDRESS</u>	<u>96792</u>	<u>DATE</u>
Nancy Alapai Hega	<i>Nancy Hega</i>	94-120 Makou St Honolulu		12-16-89
Velma Alapai Kauchi	<i>Velma Kauchi</i>	P.O. Box 2433 Kailua-Kona, HI		12-18-89
Margaret Alapai	<i>Margaret Alapai</i>	78-6615 Alii Dr. Kailua-Kona		12-18-89
Sally Alapai	<i>Sally Alapai</i>	P.O. Box 1071 Kealahou, HI 96750		12-18-89
Ellen Alapai Johnson	<i>Ellen Johnson</i>	P.O. Box 1333 Athens GA 30611		12-18-89
GEORGE K. ALAPAI	<i>George K. Alapai</i>	P.O. Box 67 Haleakala		96755
Gordon Alapai	<i>Gordon Alapai</i>	P.O. Box 1071 Kealahou, HI		96755
Howard K.K. Alapai	<i>Howard K.K. Alapai</i>	P.O. Box 2391 Kailua, Kona		96755
ROSE L. ALAPAI	<i>Rose L. Alapai</i>	P.O. Box 67 Haleakala		96755

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PRINTED NAME	SIGNATURE	ADDRESS	DATE
Herbert K. Maadi	<i>Herbert K. Maadi</i>	P.O. Box 5213 K.K. 96745	12-18-89
Leon Aiea	<i>Leon Aiea</i>	P.O. Box 67 96725	12-18-89
Roger W. Akac	<i>Roger W. Akac</i>	P.O. Box 67 96725	12-18-89
Ralph Hapa	<i>Ralph Hapa</i>	75-6615 Ali Dr.	12-19-89
Shaula Tremaine	<i>Shaula Tremaine</i>	74 7674 B Munnahua Hwy H	12-18-89
Beth Ann Price	<i>Beth Ann Price</i>	P.O. Box 5213 K.K. 96745	12-18-89

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PRINTED NAME	SIGNATURE	ADDRESS	DATE
Raymond K. Alapai	<i>Raymond K. Alapai</i>	89-013 Maipohulu	12-20-57
Isabell Alapai	<i>Isabell Alapai</i>	89-713 Maipohulu	
E. Rose Kuanani	<i>E. Rose Kuanani</i>	74-995 Kealahou St. K.K. d.	
Melvin K. Kuanani	<i>Melvin K. Kuanani</i>	74-995 Kealahou St.	
John H. Alapai	<i>John H. Alapai</i>	P.O. Box 51 Milford, Kansas 6514	
IVV L. KIZLER	<i>Ivy L. Kizler</i>	21470 Vine St. Lake Elsinore, Calif.	12-20-57

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PRINTED NAME	SIGNATURE	ADDRESS	DATE
William J Hooper III	<i>William J Hooper III</i>	P.O. Box 1553 Kilauea	12-13-89
Emmaline C. Hooper	<i>Emmaline C. Hooper</i>	P.O. Box 1553 Kilauea	12/13/89
MARY K. TARDY	<i>Mary K. Tardy</i>	P.O. Box 83496745 Kilauea	
	<i>Mary K. Mitchell</i>		



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PRINTED NAME	SIGNATURE	ADDRESS	DATE
Scott Jones	<i>Scott Jones</i>	74-5081 Koi Opua St. K-K, HI	1-4-90
Leila Jones	<i>Leila Jones</i>	74-5081 Koi Opua St. K-K, HI	1-4-90
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JOYCE HAVERKATE	<i>J. Haverkate</i>	P.O. Box 2387. K.K. HI	1-5-90
<i>Heleia Kato</i>	<i>Heleia Kato</i>	P.O. Box 7 KIEALAKIEKUA	1-5-
CAROL LY KINDT	<i>Carol Ly Kindt</i>	P.O. Box 370 K-K 96745	1-5-90
<i>John W. Lindsey</i>	<i>Daniel Lindsey</i>	P.O. Box 271 HAWAII HI	1-6-90
Ferniers A. Ruddle	<i>Ferniers A. Ruddle</i>	P.O. Box 651	1-6-90

