FINAL
ENVIRONMENTAL ASSESSMENT

Lanai Veterans Cemetery

TMK: (2) 4-9-02: por. 1

M&E Pacific, Inc.
Consulting Engineers

1994-09-23 - LA-FEA - Lanai Veterans Cemetery

SEP 23 1994

FINAL ENVIRONMENTAL ASSESSMENT

Lanai Veterans Cemetery

TMK: (2) 4-9-02: por. 1

Prepared for

State of Hawaii
Department of Defense

September, 1994

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
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September 12, 1994

Engineering Office

Mr. Bruce Anderson, Interim Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96814

Subject: Lanai Veterans Cemetery

Dear Mr. Anderson:

The State of Hawaii Department of Defense has reviewed the draft environmental assessment for the Lanai Veterans Cemetery and received no comments during the 30-day public comment period which began on February 23, 1994. The agency has determined that this project will not have significant environmental effect and has issued a negative declaration. Please publish this notice in the September 23, 1994 OEQC Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the final EA. Please contact Lt. Col. Jerry Matsuda at 735-3522 if you have any questions.

Sincerely,

Jerry M. Matsuda
Lieutenant Colonel
Hawaii Air National Guard
Contracting & Engineering Officer

cc: M & E Pacific, Inc.

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I. APPLICANT

The applicant for the proposed Lanai Veterans Cemetery is the State of Hawaii Department of Defense. According to §343-5 of the Hawaii Revised Statutes (HRS), the preparation of an Environmental Assessment (EA) is required because of the use of State funds [§343-5(1)].

II. APPROVING AGENCIES

The approving agency for a determination of significance for this Environmental Assessment are:

a. Department of Veterans Affairs
b. State Department of Defense

III. AGENCIES CONSULTED

Federal:

Department of Veteran Affairs

State of Hawaii:

Department of Business, Economic Development and Tourism:
Land Use Commission
Dept. of Land and Natural Resources:
Office of Conservation and Environmental Affairs
Division of Water and Land Development
Commission on Water Resources Management
Historic Preservation Division
Forestry and Wildlife Division
Office of Environmental Quality Control

County of Maui:

Department of Water Supply
Planning Department

IV. GENERAL DESCRIPTION OF THE ACTION'S CHARACTERISTICS

The Lanai Veterans Cemetery project consists of the construction of a new cemetery on the island of Lanai. The census of 1990 indicated that 119,256 veterans live in Hawaii with approximately 172 on the island of Lanai. The Lanai Veterans Cemetery project would provide interment space for Lanai veterans and their families.

Figures 1 and 2 show the location of the proposed Veterans Cemetery site. The site is identified as a one (1) acre section of Tax Map Key (TMK) (2) 4-9-02: por. 1, and the owner is identified as Castle & Cooke, Inc. The Lanai Land Company has agreed to donate the land to Maui County. The subject project is in the Lanai District in the County of Maui, approximately two (2) miles north of Lanai City and one tenth (0.1) miles north of the existing Lanai Community Cemetery. The Site Plan is shown in Figure 3.

The project consists of the development of one (1) acre of land to include burial sites, support facilities, ceremonial/memorial facilities and a site access road. The proposed development will provide approximately 1,000 available gravesites and should provide sufficient interment capacity for at least 20 years. The cemetery will also include facilities designed to accommodate an average of two (2) visitors per day, with more (approximately 25) expected during funerals, Memorial Day activities and Veterans Day activities. Construction of all facilities shall be to current Veterans Affairs, Occupational Safety and Health Administration, and handicapped accessibility requirements.

V. ENVIRONMENTAL CHARACTERISTICS OF THE PROPOSED ACTION

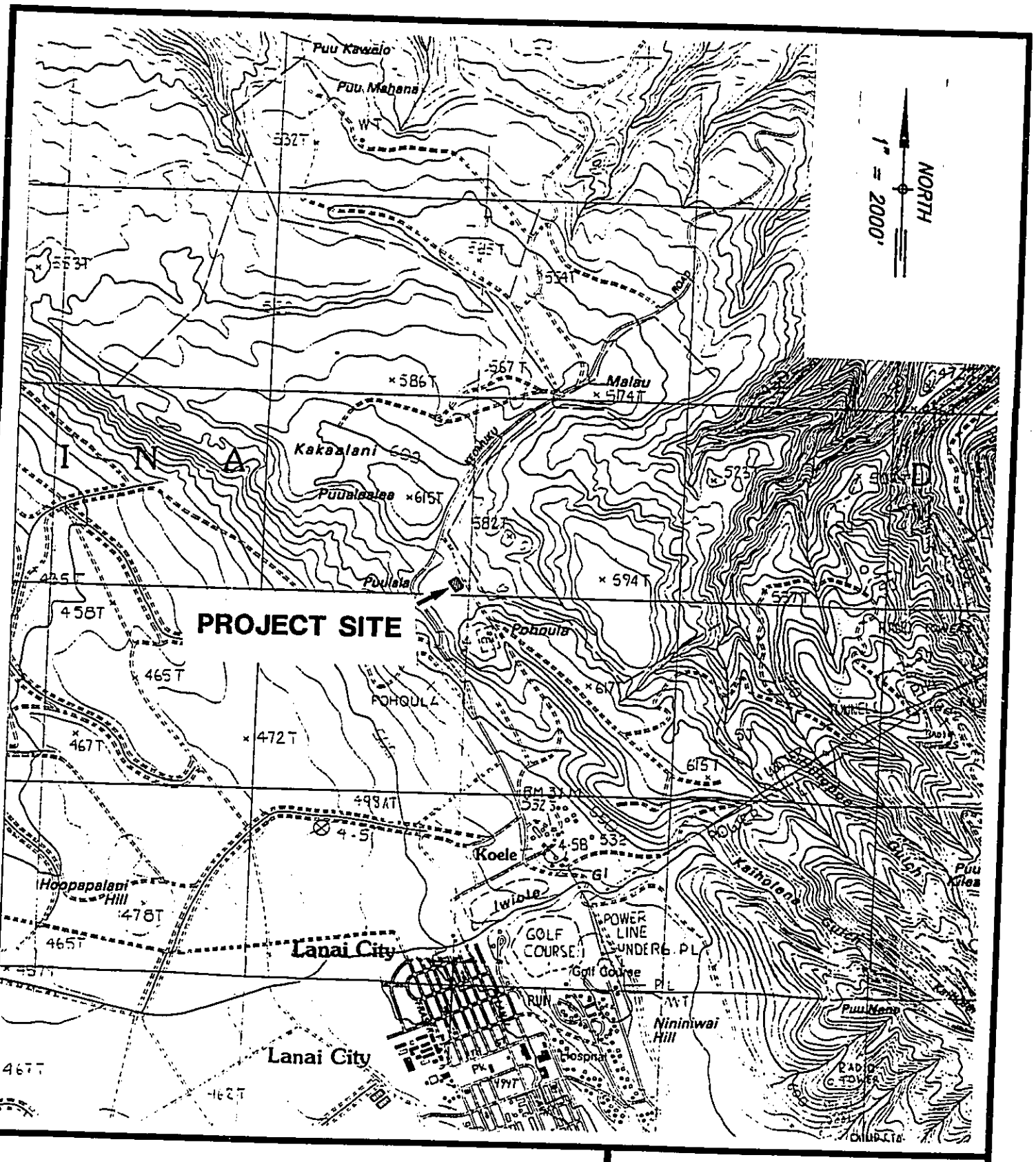
Water and Wastewater

The development plans do not include the installation of water and sewer lines. Potable bottled water will be delivered to the site on an as-needed basis. The proposed project will have restroom facilities with plans for a 500 gallon storage tank for non-potable water. Non-potable water will be periodically brought to the site via tanker truck. The peak flow determined per Uniform Plumbing Code specifications is estimated to be 50 gallons per minute. Average daily requirement is estimated to be 22 gallons of non-potable water. The proposed project does not include irrigation of the cemetery grounds. Landscaping of the cemetery grounds will incorporate Norfolk Pine and low maintenance grasses based upon a non-irrigated xeriscape concept.

Approximately 32 gallons of wastewater per day will be generated from the cemetery facilities. Peak flow is estimated at 120 gallons per day. Wastewater generated from the restroom facilities will be directed to an on-site septic system with a 750 gallon capacity septic tank. The location of the septic drain fields will be based upon the recommendations of a soils investigation and geotechnical engineering report.

Site Access

Access to the site will be via a road constructed from Laniolo Road (see Figure 3). For purposes of concept plan preparation, it has been assumed that new roads will conform to the Maui County Code Subdivision Design Standards. In accordance with the Veterans Administration Cemetery Program Guide, graves should not be closer than 10 feet from the edge of the street, and the maximum distance from any gravesite to the road should be 275 feet.

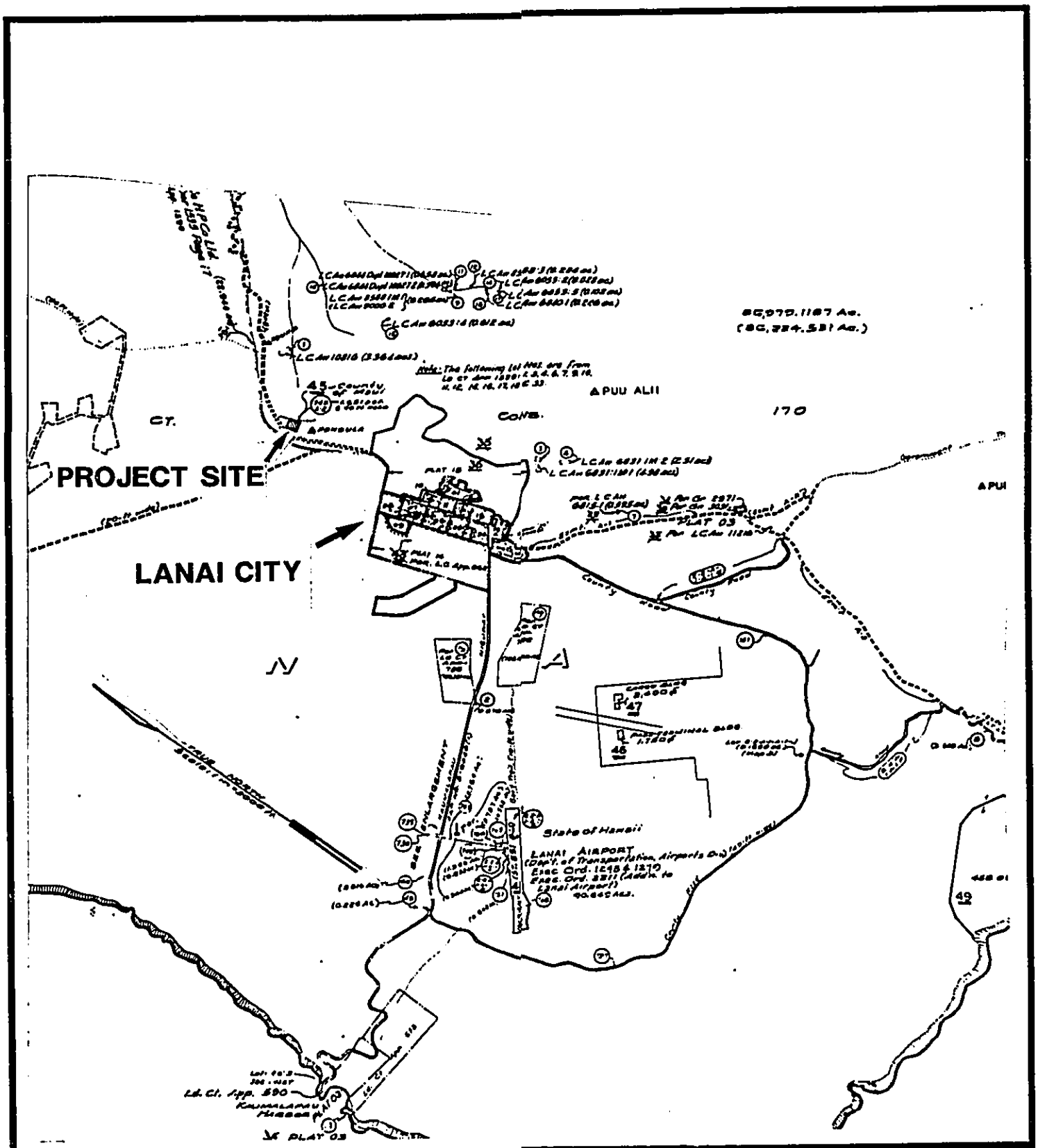


LANAI VETERANS CEMETERY

T.M.K.: (2) 4–9–02: por. 1

FIGURE 1

REGIONAL LOCATION MAP

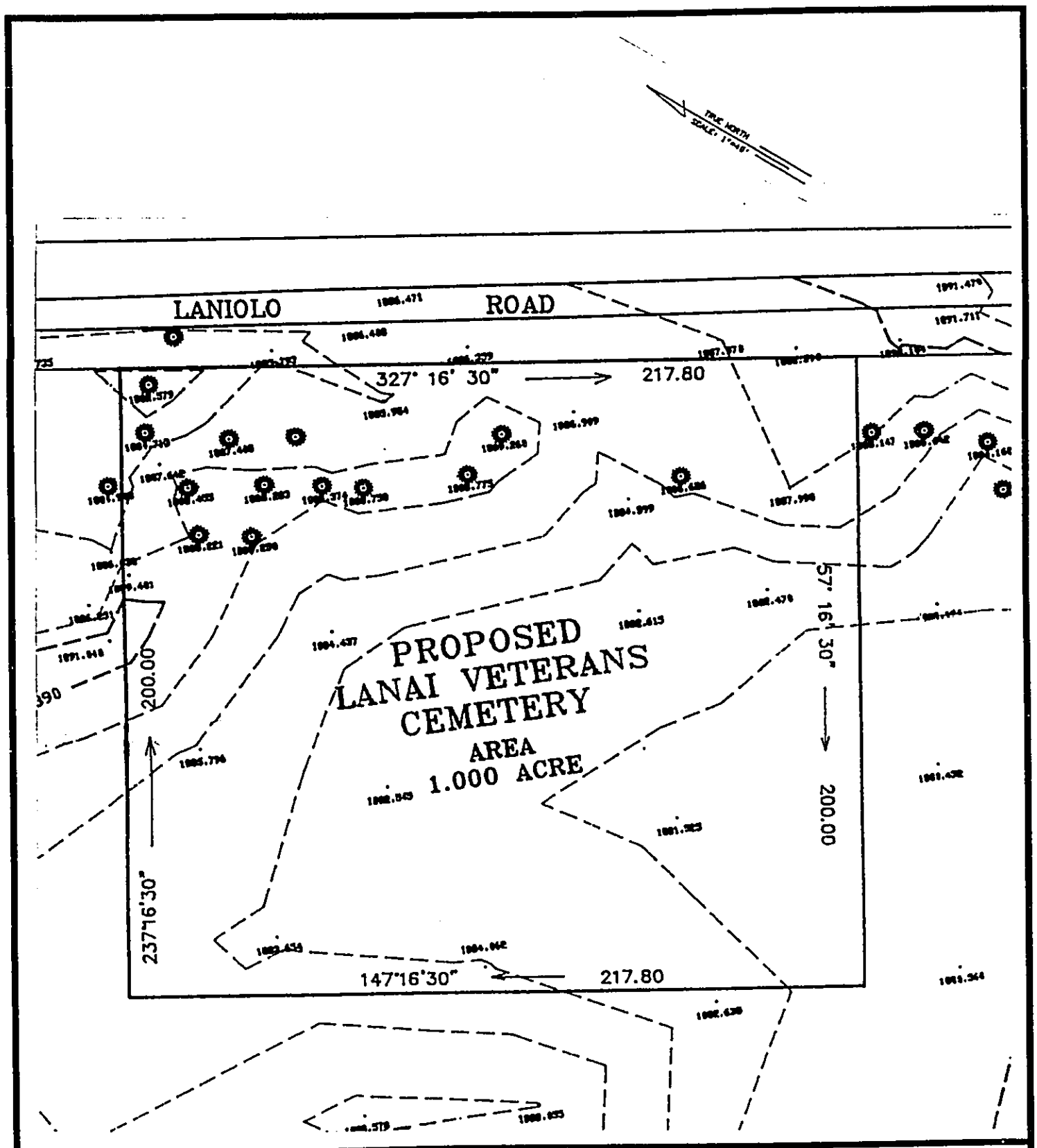


LANAI VETERANS CEMETERY

T.M.K.: (2) 4–9–02:por. 1

FIGURE 2

TAX MAP KEY LOCATION MAP



LANAI VETERANS CEMETERY T.M.K.: (2) 4-9-02: por. 1	**FIGURE 3** SITE PLAN

Grading and Drainage
The terrain at the project site is relatively flat but uneven. Elevation ranges from 1,881 feet MSL to 1,891 feet MSL, and the average slope is less than 5%. One (1) acre of land will be developed. The final grade of the cemetery will conform to the natural contours of the project area wherever possible. However, the grade will be worked to prevent the concentration of water during storm events. The access roadway will not include gutters, and there will be no grassed swales or other structures designed to alter or concentrate the flow of stormwater. Thus, stormwater which reaches the developed cemetery area will either percolate into the subsurface or traverse the site via sheet flow across the surface.

In accordance with Veterans Administration Cemetery Program Guide requirements, all on-site roadways will have a grade less than 10%, and all gravesites will be located on land with a grade less than or equal to 15%.

Infrastructure
The project will not access water, sewer, telephone or electrical power service lines. Potable and non-potable water will be brought to the site on an as-needed basis.

VI. SUMMARY OF AFFECTED ENVIRONMENT

Land Use Zoning
The project site is classified as an Agricultural District by the State Land Use Commission. The Community Plan Land Use category is Rural. The Rural category is assigned "...to protect and preserve areas consisting of small farms intermixed with low-density single-family residential lots." Development is governed by the requirements of Chapter 205 HRS.

Land use in the vicinity of the project site consists of animal grazing (primarily occurring east of Laniolo Road). Additionally, the existing Lanai Community Cemetery is located approximately 0.1 miles south of the project site.

Geology and Soils
The island of Lanai was formed by a shield volcano built by eruption of lava at the summit and along three rift zones. The lava flows of Lanai belong to the Lanai volcanic series. The project site is approximately five miles from the former summit of the volcano.

The USDA Soil Conservation Service classifies the soil in the area as KRL, Koele-Badland complex (Foote *et al.*, 1972). The soils are over five feet thick and consist of silty clay loams, silty to sandy loam, and fine sand. The permeability of the soil is moderately rapid and runoff is slow to medium.

Water
The site is located near the center of the island of Lanai and occurs above ("mauka" of) the Underground Injection Control (UIC) line. Water supply tunnels and water wells on Lanai withdraw water from high-level, dike confined groundwater (DLNR, 1992). There are no surface waters near the project area.

Climate
The island of Lanai is in the rain shadow of West Maui and East Molokai and receives relatively little precipitation. The average annual rainfall in the project area is approximately 37 inches. The average temperature is 79°F and ranges from a low of 46°F to a high of 88°F.

Archaeological Resources
An archaeological reconnaissance of the subject property was performed by Cultural Surveys Hawaii on November 15, 1993 to determine and document the presence of any archaeologically significant sites. This section summarizes the findings of the report (Cultural Surveys Hawaii, 1993). The report is presented in Appendix A - Archaeological Reconnaissance.

The project area is located within the ahupua'a of Paoma'i, which comprises an area of more than 9,000 acres. No recent archaeological studies have occurred within any substantial portion of the ahupua'a of Paoma'i. Historical documentation suggests that the population of Paoma'i was most concentrated along the coast where marine resources were readily available and where potable water may have been obtainable from springs.

The historical evidence and previous archaeology indicate that the upper plateau of Lanai witnessed permanent settlement supported by dryland agricultural crops. This occupation was probably concentrated along the edges of the Miki and Palawai basins and probably did not extend upslope to the steeper terrain of the present project area.

Animal grazing has contributed to the problem of heavy erosion at the site, and it appears never to have been used for pineapple cultivation because of the uneven terrain and its location at the top of a steep slope.

The surface survey of the project site undertaken on November 15, 1993 showed no evidence of archaeological or historic sites. Special attention was given to locating flake or midden scatters, but no such evidence was found.

Biological Resources
A botanical reconnaissance of the subject property was performed on November 15, 1993 to determine the floristic composition of the site. This section summarizes the findings of the report (Nagata, 1993). The report is presented in Appendix B - Botanical Reconnaissance.

The vegetation of the region has been described as one of open shrubs and grasses. Guava (*Psidium guajava*), the predominant shrub, is more common in the lower elevations but extends to higher elevations in gullies. Koa haole (*Leucaena leucocephala*) is another abundant shrub in the lower elevations where it forms dense stands. Smaller shrubs such as indigo (*Indigofera suffruticosa*), pidgeon pea (*Chamaecrista nicitans*), ilima (*Sida fallax*) and uhaloa (*Waltheria indica*) are found in smaller numbers. Grasses are abundant in this zone. Bermuda (*Cynodon dactylon*) is dominant on rich soils and pilipiliula (*Chrysopogon aciculatus*), rice grass (*Paspalum scorbiculatum*) and yellow foxtail (*Setaria gracilis*) are found on eroded slopes and poor soils.

The vegetation in the project site is essentially secondary in nature. The vegetation was found to be primarily a scrubby grassland of molasses grass with emergent guava 3-10 feet tall. Molasses grass, the dominant species, provides approximately 60% cover and grows to a height of three (3) feet in some areas. Scattered in the herb layer in moderate numbers are *Hyparrhenia hirta* which forms small localized stands and yellow foxtail which is most common in open sites and erosional scars. Also, present in open sites are Jamaica vervain (*Stachytarpheta jamaicensis*), pidgeon pea, uhaloa, pilipiliula and narrow-leaved plantain (*Plantago lanceolata*). Very few aborescent species are present in this community. Guava, the most common, provides approximately 10% cover. A few individuals of Christmas berry (*Schinus terebinthifolius*) and *Eucalyptus* sp. occur in the site, and a row of *Araucaria* sp. lines Laniolo Road.

Native species comprise a small fraction of the total vegetational cover in the property. Six native species were recorded in the subject property. All are common indigenous species which are widespread throughout the region as well as on other islands in the state and elsewhere in the Pacific. Pukiawe (*Styphelia tameiameiae*), huehue (*Coddulus tribolus*), aalii (*Dodonaea viscosa*), bracken fern (*Pteridium aquilinum* var. *decompositum*) and uhaloa are present in small numbers, and only three (3) individuals of ulei (*Osteomeles anthyllidifolia*) were observed. No native plant communities were recognized in the site or in adjacent areas.

VII. SUMMARY OF MAJOR IMPACTS

Construction of the cemetery will consist of the development of one (1) acre of land. The majority of this land will be used as a burial area. The site is isolated with respect to sensitive receptors, and the project is not expected to create any major adverse environmental impacts.

VIII. MITIGATION MEASURES

The Lanai Veterans Cemetery project will be designed to minimize disturbance of the existing natural setting. The landscaped cemetery grounds will incorporate Norfolk Pine

and low maintenance grasses based upon a non-irrigated xeriscape concept. Suitable sources of required construction materials will be located during the design phase of the project to minimize potential off-site impacts.

IX. ALTERNATIVES TO THE PROPOSED ACTION

No Project
The construction of the Lanai Veterans Cemetery will benefit veterans and their families by precluding the necessity for interment at a private cemetery. Presently, veterans are eligible for interment at the Hawaii State Veterans Cemetery at Kaneohe, Oahu. However, interment at this locations would result in additional time and expense for Lanai veterans and their families.

Alternate Site
The land for the Lanai Veteran Cemetery will be donated to Maui County by the Lanai Land Company. An alternate site may involve costly land purchases and may not suit the needs of Lanai veterans and their families.

X. DETERMINATION

In accordance with Title II, Chapter 200, Environmental Impact Statement Rules, this Environmental Assessment has characterized the technical and environmental nature of the project, identified potential impacts, evaluated the potential significance of these impacts, and provided for detailed study of the major impacts during the design phase of the project.

It is anticipated that the proposed Lanai Veterans Cemetery will not significantly impact the environment. Therefore, a Negative Declaration has been issued for this project.

XI. REFERENCES

Agencies and individuals consulted during preparation of this Environmental Assessment:

State of Hawaii:

Department of Business, Economic Development and Tourism:
Land Use Commission, Fred Talon
Department of Land and Natural Resources:
Office of Conservation and Environmental Affairs, Steve Tagawa
Division of Water and Land Development, Niel Fujii
Commission on Water Resources Management, Roy Hardy
Historic Preservation Division, Annie Griffin
Forestry and Wildlife Division, Dr. Carolyn Corn
Office of Environmental Quality Control, Jeyan Thirugnanam

County of Maui

Department of Water, Ed Kagahiro
Planning Department, Brian Miskae

Documents reviewed during preparation of this Environmental Assessment:

Armstrong, R.W., editor, 1983, *Atlas of Hawaii*, second edition. Department of Geography, University of Hawaii. University of Hawaii Press, Honolulu.

Cultural Surveys Hawaii, 1993, *Archaeological Inventory Survey of a 1-Acre Parcel in the Ahupua's Paoma'i, Island of Lana'i*, prepared for M&E Pacific.

Foote, D.E., Hill, E.L., Nakamura, S., Stephens, F., 1972, *Soil Survey of islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*: U.S. Dept. of Agriculture, Soil Conservation Service.

Hawaii Department of Land and Natural Resources (DLNR), 1992, *Groundwater index and Summary*.

Hawaii Department of Taxation, Tax map for second division, zone 4, section 9, plat 02, Scale 1:36,000.

Nagata, K.M., 1993, *Lanai Veterans Cemetery Botanical Reconnaissance*, prepared for M&E Pacific.

U.S. Geological Survey, 1983, Topographic Map of Lanai North Quadrangle, Hawaii, Scale 1:24,000.

APPENDIX A

Archaeological Reconnaissance

ARCHAEOLOGICAL INVENTORY SURVEY OF A 1-ACRE PARCEL IN THE *AHUPUA'A* PAOMA'I, ISLAND OF LANA'I (TMK (2) 4-9-002:001 portion)

by

Hallett H. Hammatt, Ph.D.
and
Rodney Chiogioji, B.A.

DRAFT

Prepared for

M&E PACIFIC, INC.

CULTURAL SURVEYS HAWAII
December 1993

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I. INTRODUCTION AND PROJECT AREA DESCRIPTION

At the request of M&E Pacific, Inc., Cultural Surveys Hawaii has completed an archaeological inventory survey of a 1-acre parcel (TMK (2) 4-9-002: 001 portion) in the *ahupua'a* of Paoma'i on the island of Lāna'i (Figures 1 & 2). The parcel is a portion of lands owned by the Lanai Company and is located 2 kilometers north of Lāna'i City. It has been proposed as the site for a Lāna'i veterans' cemetery.

Project Area Description

The project area consists of one acre of land located at the 600 meter (1980 foot) elevation fronting Laniolo Road which forms the boundary of the project area on its northeast side (Figures 3 & 4). The northwest, southwest and southeast sides of the project area are unmarked. The terrain is undulating with small hillocks and ridges which have been heavily eroded, presumably due to overgrazing (during the nineteenth and early twentieth centuries). Much of the project area is bare unvegetated ground. Signs of reforestation of this plateau land are shown in the Norfolk pine planted throughout the project area, particularly along the edge of Laniolo Road. The low-lying portions are vegetated with molasses grass and short guava and christmasberry scrub. Also present were short eucalyptus trees and scattered lantana. Various dirt-track roads meander through the project area.

Although the project area is heavily eroded by former grazing, it appears never to have been used for pineapple cultivation because of the uneven terrain and its location at the top of a steep slope.

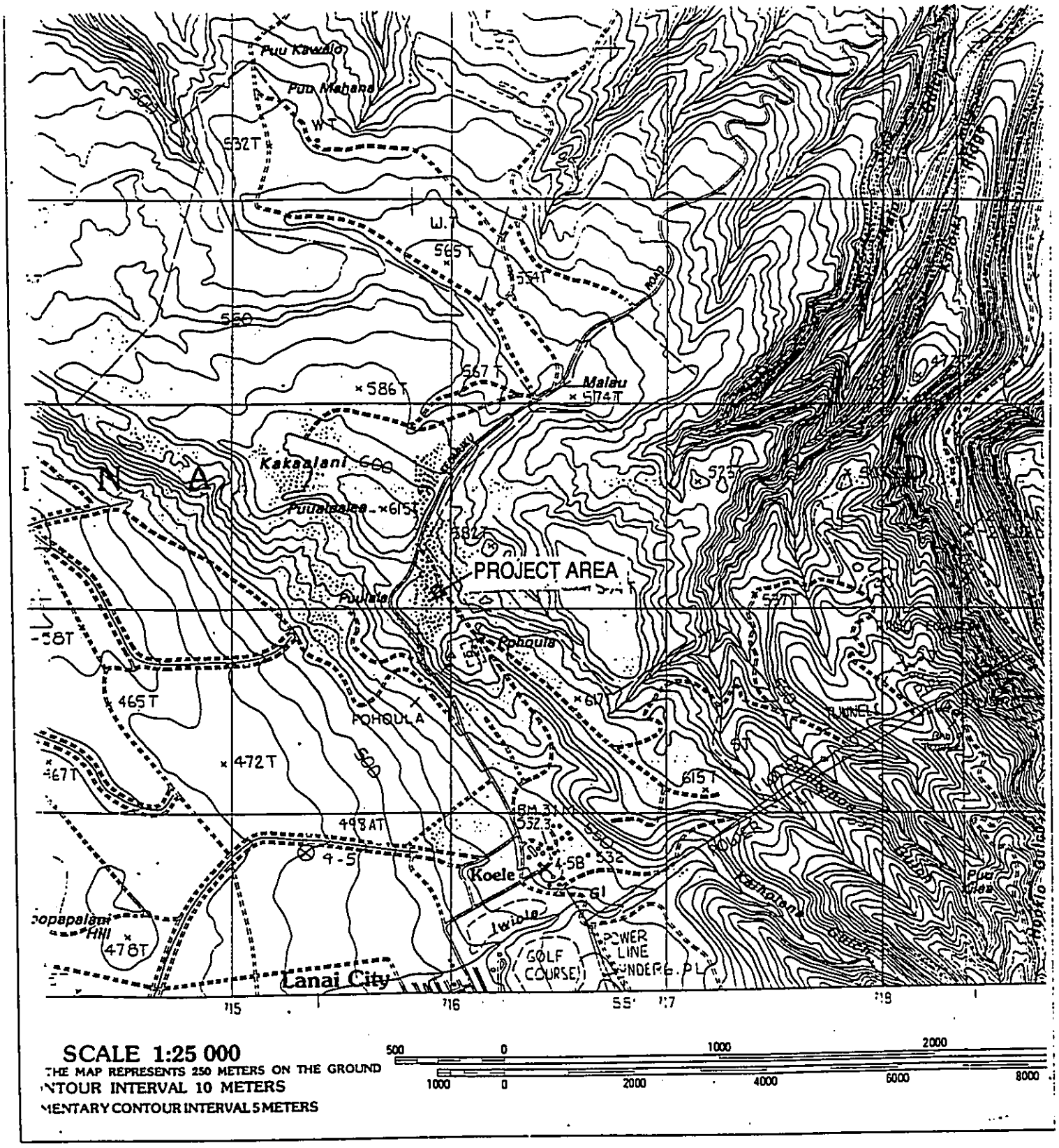

Figure 1 Portions USGS 7.5 Minute Series Topographical Map, Lanai quadrangle, showing Project Area

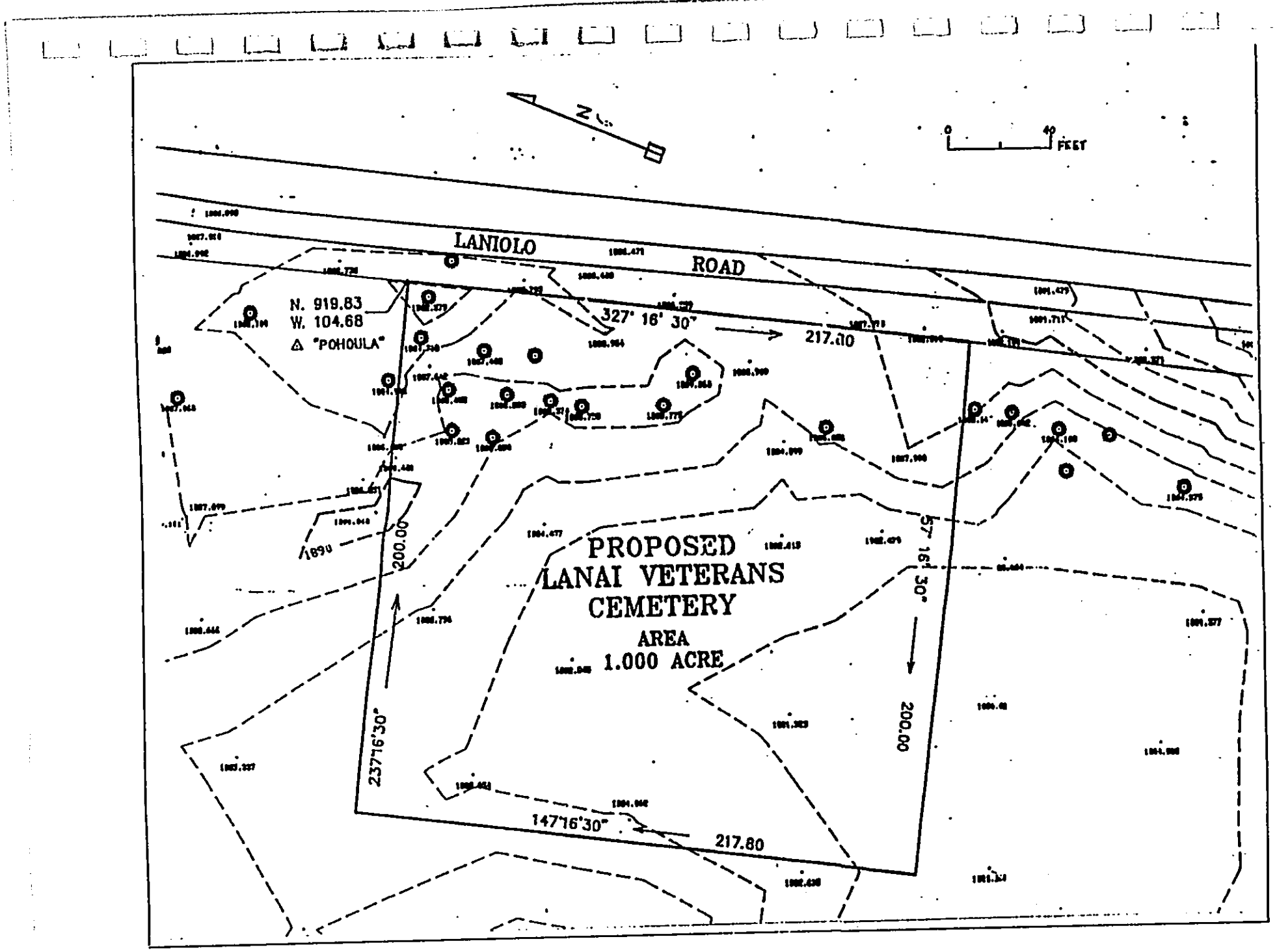

Figure 2 Project Area map

Figure 3 Project Area showing vegetated terrain; view northwest

Figure 4 Project Area showing eroded areas; view southwest

II. *AHUPUA'A* SETTLEMENT PATTERN BASED ON HISTORICAL DOCUMENTATION AND PREVIOUS ARCHAEOLOGICAL STUDY

No recent archaeological studies have occurred within any substantial portion of the *ahupua'a* of Paoma'i (which comprises an area of more than 9000 acres). Historical documentation, which might give clues to the traditional settlement pattern within Paoma'i, is likewise scanty. An account of how the *ahupua'a*'s bounds were established and of how a portion of Maui came to be included within those bounds, though, is suggestive of a traditional prestige and importance - which were sustained by a flourishing population - for the *ahupua'a*:

> Paoma'i district also was determined by a foot race against time. The *konohiki* not only finished marking off the present bounds, but he crossed in a canoe to Lahaina, Maui, and took in the land next to the present wharf which is called Puu Lanai. He was completely exhausted and his district was named after him, Paoma'i, Sick Pao. (Emory 1969:20)

Records associated with mid-nineteenth century Land Commission Awards reveal nothing of then-current living patterns within the *ahupua'a*. No *kuleana* were awarded within Paoma'i; the entire *ahupua'a* was unassigned at mid-century and became Crown lands in 1890.

The pioneering effort of Kenneth Emory to document the archaeology of Lana'i during the early 1920's presents the first picture of settlement patterns within Paoma'i as revealed by archaeological remnants. Emory's map of Lana'i indicating locations of "visible house sites" shows these sites clustered along the coastal portion of Paoma'i (similarly to other *ahupua'a* along the windward coast of Lana'i) and a smaller clustering of sites within the *mauka* reaches of the *ahupua'a* just below the steepest ridge (Emory 1969:49). This patterning suggests that the population was most concentrated along the coast where marine resources were readily available and where potable water may have been obtainable from springs. Moving *makai* from the coast, an increasingly barren environment supported more temporary

activities - including transient habitation and agricultural activities. As was confirmed by the house sites Emory located at the *mauka* extent of the *ahupua'a*, permanent habitation within Paoma'i became possible once again as the *ahupua'a* ascends to the Lana'i plateau which was much more extensively forested before nineteenth century farming and ranching activities transformed the landscape.

> The areas [formerly] covered by this forest extended along the windward slopes of the mountain and on to the top lands of Maunalei, Mahana, Kamoku, Paoma'i, Ka'a, and the flat lands of Kamoku, Kalulu, and Kaunolu, extending also below the mountains from Kamoku to Kaohai. The value of this forest to the early [Hawaiian] settlers could not be underestimated, as it kept these areas supplied with ample rainfall for the necessities of life. (Gay 1965:51)

Land Commission Award records for neighboring *ahupua'a* document *kuleana* (individual land parcels) - all at elevations well above 1000 feet - upon which sugar cane, sweet potatoes and gourds were cultivated. It is possible that similar crops supported the *mauka* inhabitants of Paoma'i.

III. SURVEY METHODS

The inventory survey fieldwork was conducted on November 15, 1993 by Hallett Hammatt accompanied by Charles Stone and Wesley Geertsema of M&E Pacific, Inc., and Ken Nagata, botanical consultant. Access to the project area was from Laniolo Road.

During the fieldwork, a topographic map of the project area and the surrounding terrain showing locations of Norfolk pines as well as metes and bounds was utilized to locate the project area boundaries.

Fieldwork was accomplished in two hours and consisted of northeast/southwest-oriented survey sweeps beginning at, and running perpendicular to, Laniolo Road. On each sweep a visual corridor measuring 30 meters on each side of the archaeologist was inspected. Of particular concern was the examination of unvegetated eroded areas for signs of cultural material such as marine shell and basalt flakes. Also, eroded cut banks were examined for signs of cultural layers, charcoal and other remains.

In general, ground visibility was excellent particularly in the heavily eroded areas.

IV. SURVEY RESULTS AND RECOMMENDATIONS

Survey Results

The surface survey of the one-acre project area showed no evidence of archaeological or historic sites even though special attention was given to locating flake or midden scatters which may indicate nearby archaeological deposits. No such evidence was found. Heavy erosion has exposed much of the subsoil and, if archaeological deposits were present, they would almost certainly have been observed during the survey.

The historical evidence and the previous archaeology reported by Emory indicate that this upper plateau witnessed permanent settlement supported by dryland agricultural crops.

This occupation was probably concentrated along the edges of the Miki and Palawai basins and probably did not extend upslope to the steeper terrain of the present project area.

Recommendations

Considering the negative results of the inventory survey - i.e. surface sites are not present - further investigation is not justified since it appears that the project will have no impact on archaeological sites. Construction monitoring also does not appear to be warranted. However, if subsurface archaeological deposits including human burials are encountered during development of the property into a veterans cemetery, all activities should stop in that area and the State Historic Preservation Division of the Department of Land and Natural Resources should be notified.

V. REFERENCES

Ashford, Marguerite K.
1974 "Lanai: A Narrative History." Department of History, Stanford University: Palo Alto.

Emory, Kenneth P.
1969 *The Island of Lanai: A Survey of the Native Culture*. Bernice P. Bishop Museum Bulletin 12. Honolulu: Bishop Museum Press.

Gay, Lawrence Kainoahou
1965 *True Stories of the Island of Lanai*. Honolulu: Rogers Printing.

APPENDIX B

Botanical Reconnaissance

VETERANS CEMETERY, LANAI
BOTANICAL RECONNAISSANCE

Prepared for: M & E Pacific, Inc.

By: Kenneth M. Nagata

Date: 20 November 1993

INTRODUCTION

The project site is situated near the crest of the Keomoku grade just south of Puualealea, island of Lanai. It occupies one acre on the upper west slope of the ridge between Puualealea and Pohoula at approximately 1890' elevation. Laniolo Road which traverses that ridge, forms one boundary of the property.

The vegetation of the region has been described as one of open shrubs and grasses (Ripperton & Hosaka 1942). Guava (Psidium guajava), the predominant shrub, is more common in the lower elevations but extends to higher elevations in gullies. Koa haole (Leucaena leucocephala) is another abundant shrub in the lower elevations where it forms dense stands. Smaller shrubs such as indigo (Indigofera suffruticosa), pidgeon pea (Chamaecrista nictitans), 'ilima (Sida fallax) and 'uhaloa (Waltheria indica) are found in smaller numbers. Grasses are abundant in this zone. Bermuda (Cynodon dactylon) is dominant on rich soils and pilipiliula (Chrysopogon aciculatus), rice grass (Paspalum scorbiculatum) and yellow foxtail (Setaria gracilis) are found on eroded slopes and poor soils.

A vegetation survey of a 150 acre parcel further south along the ridge from the subject property was conducted in 1989 (Nagata 1989). This site consists of a large plateau area dissected by small ravines, and the eroded slopes of the east and west slopes of the ridge. The vegetation was found to consist of secondary forests, thickets, grasslands and scrub. The main vegetation type on the plateau is a grassland dominated by molasses grass (Melinis minutiflora). Associated species in this community include narrow-leaved plantain (Plantago lanceolata), Hyparrhenia hirta, yellow foxtail, and pidgeon pea. Forests of red ironbark (Eucalyptus sideroxylon), thickets of Christmas berry (Schinus terebinthifolius) and an open scrub community are found on the outer slopes of the plateau and in the ravines. The forest and thicket communities are generally dense and closed-canopied. The open scrub community consists of scrub strawberry guava (Psidium cattleianum) and ironwood (Casuarina equisetifolia) 4-10' tall and a sparse herb layer of perennial foxtail, molasses grass and West Indian dropseed (Sporobolus indicus).

METHODS

A walk-through survey with at least 30% coverage was conducted on 15 November 1993 to determine the floristic composition of the project site. All

plants which could not be identified in the field were brought back to the lab for closer examination. Special effort was made to identify native plant communities and rare and endangered species.

RESULTS

The vegetation in the project site was found to be essentially a scrubby grassland of molasses grass with emergent guava 3-10' tall. It is nearly identical in species composition to the grassland community on the plateau further south along the ridge. Molasses grass, the dominant species, provides approximately 60% cover and grows to a height of 3' in some areas. Scattered in the herb layer in moderate numbers are Hyparrhenia hirta which forms small localized stands and yellow foxtail which is most common in open sites and erosional scars. Also present in open sites are Jamaica vervain (Stachytarpheta jamaicensis), pidgeon pea, 'uhaloa, pilipiliula and narrow-leaved plantain. Very few arborescent species are present in this community. Guava, the most common, provides approximately 10% cover. In addition, a few individuals of Christmas berry and Eucalyptus sp. occur in the site and a row of Araucaria sp. lines Laniolo Road.

Native and rare and endangered species

Six native species were recorded in the subject property. Pukiawe (Styphelia tameiameiae), huehue (Cocculus trilobus), 'a'ali'i (Dodonaea viscosa), bracken fern (Pteridium aquilinum var. decompositum) and 'uhaloa are present in small numbers and only three individuals of 'ulei (Osteomeles anthyllidifolia) were observed. All are common indigenous species which are widespread throughout the region as well as on other islands in the state and elsewhere in the Pacific. No native plant communities were recognized in the site or in adjacent areas. Native species comprise an insignificant fraction of the total vegetational cover in the property.

SUMMARY

The vegetation in the project site is essentially secondary in nature. All of the native plants in the property are species common to Hawaii and the Pacific region. The proposed project will have no impact whatsoever upon the integrity of Hawaii's native flora. Because of the small size of the site excessive erosion is not anticipated to be a serious problem.

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