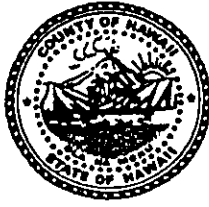


Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

RECEIVED

'03 AUG 26 P12:12

August 22, 2003

(OFF. OF ENVIRONMENTAL
QUALITY CONTROL)

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street
Leiopapa A Kamehameha, Suite 702
Honolulu, HI 96813

Dear Ms. Salmonson:

Subject: Finding of No Significant Impact (FONSI) for County of Hawaii Emergency
Digital Upgrade Microwave Project (Emergency Radio Facilities); 19 Sites
Within the County of Hawaii at Various Locations:

Site	Location / District	TMK
Capt. Cook Police Station	Captain Cook / South Kona	8-2-001:084
Fire Central	Hilo / South Hilo	2-3-018:033
Hamakua Police Station	Honokaa / Hamakua	4-5-006:003
Hilo Baseyard	Hilo / South Hilo	2-2-058:018
Huehue Ranch	Kaupulehu / North Kona	7-2-002:013
Iolehaehae	Kaohe 6 / Hamakua	4-1-006:007
Kahua Ranch (Construction by State DAGS)	Kahua Ranch / North Kohala	5-9-002:002
Kailua Police Station	Kealakehe / North Kona	7-4-020:021
Kamehameha Park	Kapaau / North Kohala	5-4-009:004
Kau Police Station	Naalehu / Kau	9-5-012:037
Kau State Bldg (Demolition Only)	Naalehu / Kau	9-5-021:010
Kauna Pt.	Manuka Natural Area Reserve / Kau	9-1-001:003
Kulani Cone	Kulani Cone / Kau	9-9-001:024
Moanuihaea	Makalei Golf Course (mauka) / North Kona	7-2-007:001
Naalehu Pasture	Naalehu / Kau	9-5-007:030
Ohia Mill	Yee Hop Ranch / South Kona	8-8-001:003
Public Safety Building	Hilo / South Hilo	2-4-025:028
Puna Police Station	Keaau / Puna	1-6-143:038
South Point	South Point / Kau	9-3-001:006
Waimea Police Station	Waimea / South Kohala	6-7-002:011

Ms. Genevieve Salmonson, Director
August 22, 2003
Page 2

The Police Department has reviewed the comments received during the 30-day public comment period which began on July 8, 2003. The agency has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the September 8, 2003 OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form and four copies of the draft EA. Please contact Major Elroy Osorio at (808) 961-2262.

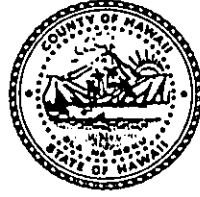
Sincerely,


HARRY S. KUBOJIRI
DEPUTY POLICE CHIEF

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

- Questions about the system's reliability during storms and power outages.
[Response: Each facility has an emergency generator in the event of power outages.]
- Kamehameha Park facility: Relocation of the tower to maximize the Park's usable area.
- Strong individual and community support for the project; and hopes there will no opposition to the tower heights.
- Aesthetic concerns; request that towers be painted where applicable.

Harry Kim
Mayor



Patricia G. Engelhard
Director

Pamela N. Mizuno
Deputy Director

County of Hawai`i
DEPARTMENT OF PARKS AND RECREATION
101 Pauahi Street, Suite 6 • Hilo, Hawai'i 96720
(808) 961-8311 • Fax (808) 961-8411

April 16, 2003

James Leonard, AICP
PBR Hawaii
101 Aupuni Street
Hilo Lagoon Center, Suite 310
Hilo, HI 96720

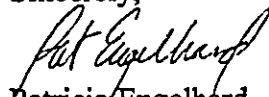
Re: Pre-Assessment Consultation for Preparation of a Draft Environmental Assessment for
the County of Hawaii Digital Microwave Upgrade Project

Dear Mr. Leonard:

The upgrading of the microwave system at Kamehameha Park has been discussed with Bill Asselborn of Scientel America, Inc. and the siting and layout of the new system has been approved.

Thank you for the opportunity to provide input.

Sincerely,


Patricia Engelhard
Director

LINDA LINGLE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF ACCOUNTING
AND GENERAL SERVICES
P.O. BOX 119
HONOLULU, HAWAII 96810-0119

RUSS K. SAITO
Comptroller

KATHERINE H. THOMASON
Deputy Comptroller

ICSD 03.0140

May 14, 2003

Mr. James M. Leonard, AICP, Managing Director
PBR Hawaii - Hilo Office
Hilo Lagoon Center, Suite 310
101 Aupuni Street
Hilo, HI 96720

Dear Mr. Leonard:

Subject: Draft Environmental Assessment for the County of Hawaii Digital Microwave Upgrade Project

The Department of Accounting and General Services (DAGS) supports this County of Hawaii project, as it will improve the operations and effectiveness of emergency communications systems within the County.

Please refer parties interested in the Kahua Ranch site to the Draft Environmental Assessment, filed by the State, that is described in the April 8, 2003 "Environmental Notice," bulletin published by the Office of Environmental Quality Control. The DAGS project at Kahua Ranch is part of the "Anuenue (formerly Rainbow) Radio Facilities and Towers, Statewide" project. When complete, the project will provide the Hawaii County Police Department with tower space for antennas and building space for radio equipment as well as take care of the requirements of State communications users.

Questions or comments regarding the disposition or use of State properties that are not DAGS facilities should be referred to the Hawaii District Land Office of the Department of Land and Natural Resources.

If you have any questions, please call Lester Nakamura, Information and Communication Services Division Administrator, at 586-1910.

Sincerely,

Handwritten signature of Russ K. Saito in cursive script.
RUSS K. SAITO
State Comptroller

Mr. James M. Leonard, AICP, Managing Director
May 14, 2003
Page 2

c: Mr. Harry M. Yada, Hawaii District Land Agent
Department of Land and Natural Resources, Hawaii District Land Office

Mr. Lester M. Nakamura, Administrator
DAGS, Information and Communication Services Division

Mr. Allen Yamanoha, Project Engineer
DAGS, Public Works, Planning Branch

Chief Lawrence K. Mahuna, Chief of Police
Hawaii County Police Department

Mr. Herbert M. "Monty" Richards
Kahua Ranch Limited

Mr. John L. Sakaguchi, Senior Planner
Wilson Okamoto and Associates, Inc.

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

May 21, 2003

MICROWWAVECOH.RCM
LD-NAV

PBR Hawaii
James M. Leonard, AICP
Principal/Managing Director-Hilo Office
101 Aupuni Street, Suite 310
Hilo, Hawaii 96720

Dear Mr. Leonard:

Subject: Pre-Assessment Consultation for the Preparation of a
Draft Environmental Assessment for the County of Hawaii
Digital Microwave Upgrade Project

Thank you for the opportunity to review and comment on the subject
matter.

A copy of your letter dated April 7, 2003 pertaining to the
subject matter was transmitted to the following Department of Land and
Natural Resources' Divisions for their review and comment:

- Division of Aquatic Resources
- Division of Forestry and Wildlife
- Commission on Water Resource Management
- Division of State Parks
- Commission on Water Resource Management
- Land-Planning and Technical Services
- Land - Hawaii District Land Office

Based on the attached responses, the Department of Land and
Natural Resources has no comment to offer on the subject matter at this
time.

Should you have any questions, please feel free to contact
Nicholas A. Vaccaro of the Land Division Support Services Branch at 1-
808-587-0384.

Very truly yours,

A handwritten signature in black ink, appearing to read "Dierdre S. Mamiya".

DIERDRE S. MAMIYA
Administrator

C: HDLO

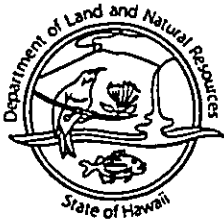
PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF STATE PARKS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
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COMMISSION ON WATER RESOURCE MANAGEMENT

AQUATIC RESOURCES
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CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

May 5, 2003

MEMORANDUM

To: Dierde S. Mamiya, Administrator
Land Division

From: Daniel S. Quinn, State Parks Administrator *D. Quinn*

Subject: Pre-Assessment Consultation for the Preparation of a DEA for the County
of Hawaii's Digital Microwave Upgrade Project

Upon the preparation of a DEA on the project, we would like to review and comment
on the document.

LINDA LINGLE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. Box 621
HONOLULU, HAWAII 96809
April 16, 2003

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DAN DAVIDSON
DEPUTY DIRECTOR FOR LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR FOR
THE COMMISSION ON WATER
RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE
MANAGEMENT
CONSERVATION AND RESOURCES
ENFORCEMENT
CONVEYANCES
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE
COMMISSION
LAND
STATE PARKS

TO: ADMINISTRATOR

Suspense Date: 5/5/03

LD/NAV
Ref.: MICROWAVECOH.CMT

MEMORANDUM:

TO: XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Engineering Division
Division of Boating and Ocean Recreation
XXX Commission on Water Resource Management
XXX Land-Planning and Technical Services
XXX Land-Hawaii District Land Office

FROM: Charlene E. Unoki, Acting Assistant Administrator
Land Division

- ADMIN
- PLANNING
- ASST BR
- CLERICAL
- ASST
- INTERP BR
- CIRC/POST/STAFF RM
- COMMENTS & REC
- DRAFT REPLY
- FILE
- FOLLOW UP
- INFO
- RUN COPIES
- RUSH DUE
- SEE ME
- FAX/SEND COPY TO

SUBJECT: Pre-Assessment Consultation for the Preparation of a Draft Environmental Assessment for the County of Hawaii Digital Microwave Upgrade Project
Consultant: PBR Hawaii (985-2222)

Please review the attached document pertaining to the subject matter and submit your comments (if any) on Division letterhead signed and dated by the suspense date.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at ext.: 7-0384.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments.

() We have no comments. (/) Comments attached.

Signed: [Signature]

Date: MAY - 5 2003

LINDA LINGLE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. Box 621
HONOLULU, HAWAII 96809
April 16, 2003

DEPUTY DIRECTOR FOR LAND
ERNEST Y.W. LAU
DEPUTY DIRECTOR FOR
THE COMMISSION ON WATER
RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE
MANAGEMENT
CONSERVATION AND RESOURCES
ENFORCEMENT
CONVEYANCES
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE
COMMISSION
LAND
STATE PARKS

LD/NAV
Ref.: MICROWAVECOH.CMT

L-1742
Suspense Date: 5/5/03

MEMORANDUM:

TO: XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Engineering Division
Division of Boating and Ocean Recreation
XXX Commission on Water Resource Management
XXX Land-Planning and Technical Services
XXX Land-Hawaii District Land Office

FROM: Charlene E. Unoki, Acting Assistant Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for the Preparation of a Draft
Environmental Assessment for the County of Hawaii Digital
Microwave Upgrade Project
Consultant: PBR Hawaii (985-2222)

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Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at ext.: 7-0384.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments.

() We have no comments.

(X) Comments attached.

Signed: 

The attached brochure will explain DOFAW's concerns for seabird's attraction to lights. Please mitigate the light attraction problems seabirds may have on the planning of this project.

Date:

MICHAEL G. BUCK, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE

APR 22 2003

LINDA LINGLE
GOVERNOR

RECEIVED

03 APR 21 A 6:11



COMMISSION ON WATER
RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. Box 621
HONOLULU, HAWAII 96809
April 16, 2003

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DAN DAVIDSON
DEPUTY DIRECTOR FOR LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR FOR
THE COMMISSION ON WATER
RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE
MANAGEMENT
CONSERVATION AND RESOURCES
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ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE
COMMISSION
LAND
STATE PARKS

L-1742

LD/NAV
Ref.: MICROWAVECOH.CMT

Suspense Date: 5/5/03

MEMORANDUM:

Ami
TO: XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Engineering Division
Division of Boating and Ocean Recreation
XXX Commission on Water Resource Management
XXX Land-Planning and Technical Services
XXX Land-Hawaii District Land Office

TE
FROM: Charlene E. Unoki, Acting Assistant Administrator
Land Division *allie*

SUBJECT: Pre-Assessment Consultation for the Preparation of a Draft
Environmental Assessment for the County of Hawaii Digital
Microwave Upgrade Project
Consultant: PBR Hawaii (985-2222)

Please review the attached document pertaining to the subject
matter and submit your comments (if any) on Division letterhead
signed and dated by the suspense date.

Should you need more time to review the subject matter, please
contact Nicholas A. Vaccaro at ext.: 7-0384.

If this office does not receive your comments on or before the
suspense date, we will assume there are no comments.

We have no comments.

Comments attached.

Signed: W. Payfardly

Date: 4/22/03

LINDA LINGLE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. Box 621
HONOLULU, HAWAII 96809
April 16, 2003

CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DAN DAVIDSON
DEPUTY DIRECTOR FOR LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR FOR
THE COMMISSION ON WATER
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AQUATIC RESOURCES
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE
COMMISSION
LAND
STATE PARKS

L-1742

LD/NAV
Ref.: MICROWAVECOH.CMT

Suspense Date: 5/5/03

MEMORANDUM:

TO: XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Engineering Division
Division of Boating and Ocean Recreation
XXX Commission on Water Resource Management
XXX Land-Planning and Technical Services
XXX Land-Hawaii District Land Office

FROM: Charlene E. Unoki, Acting Assistant Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for the Preparation of a Draft
Environmental Assessment for the County of Hawaii Digital
Microwave Upgrade Project
Consultant: PBR Hawaii (985-2222)

Please review the attached document pertaining to the subject
matter and submit your comments (if any) on Division letterhead
signed and dated by the suspense date.

Should you need more time to review the subject matter, please
contact Nicholas A. Vaccaro at ext.: 7-0384.

If this office does not receive your comments on or before the
suspense date, we will assume there are no comments.

(X) We have no comments.

() Comments attached.

Signed: Elin T. Yuon

Date: 5/1/03

03 APR 22 PM 03:13 ENGINEERS

LINDA LINGLE
GOVERNOR



RODNEY K. HARAGA
DIRECTOR

Acting Deputy Director
GLENN M. OKIMOTO

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-PS
2.0567

JUN 13 2003

Mr. James M. Leonard, AICP
PBR Hawaii
Hilo Office
101 Aupuni Street
Hilo Lagoon Center, Suite 310
Hilo, Hawaii 96720-4276

Dear Mr. Leonard:


Subject: Pre-Assessment Consultation for the Preparation of a Draft Environmental Assessment for the County of Hawaii Digital Microwave Upgrade Project, Various TMK Parcels, County of Hawaii

Thank you for requesting our comments regarding the subject document. We have the following comments:

1. The Environmental Assessment (EA) should briefly discuss the ingress/egress locations of each site. Roadway traffic conditions at these locations should be stated in the EA.
2. Since the proposed installed communication tower height is increased at all of the sites, the EA should discuss mitigation measures to minimize visual impacts that these antenna towers may cause.
3. We require the submittal and approval of construction plans for all work done within our State highway rights of way.

If you have any questions, please contact Ronald F. Tsuzuki, Head Planning Engineer, Highways Division, at 587-1830.

Very truly yours,


for RODNEY K. HARAGA
Director of Transportation

LINDA LINGLE
GOVERNOR OF HAWAII



GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
Telephone (808) 586-4185
Facsimile (808) 586-4186
Email: oeqc@health.state.hi.us

April 23, 2003

James Leonard
PBR Hawaii
101 Aupuni St. #310
Hilo, HI 96720

Attn: Yukie Ohashi

Dear Mr. Leonard:

Subject: Pre-Assessment Consultation, Draft EA
Microwave Upgrade Project, Emergency Radio Telecommunications

Thank you for the opportunity for input into the draft EA you are preparing. Telecommunications towers are sometimes a source of controversy between the applicant and the public. We therefore request that your draft EA include the following:

1. Extensive community contact including, if possible, public presentations;
2. Visual analyses, including photos or drawings of the towers;
3. Discussion of rare, threatened and endangered species of flora and fauna; the possibility of bird strikes, with corresponding mitigation measures;
4. Physical requirements imposed by the FAA, including static or blinking lights;
5. The relation of the proposed 6 Ghz microwave system to FCC requirements and standards.
6. Impacts to conservation lands; and
7. A discussion of the project's impacts on current cultural and traditional practices, without reliance on the findings presented in an archeological/historical resources report.

Sincerely,

A handwritten signature in cursive script that reads "Genevieve Salmonson".
GENEVIEVE SALMONSON
Director



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

April 17, 2003

REPLY TO
ATTENTION OF

Regulatory Branch

Mr. James M. Leonard, AICP
PBR Hawaii
101 Aupuni Street, Suite 310
Hilo, Hawaii 96720

Dear Mr. Leonard:

This is in response to your letter dated April 7, 2003, regarding the County of Hawaii's proposal to upgrade the emergency radio telecommunications facilities located throughout the County of Hawaii. In addition to the upgrade, it was noted in your letter that an additional fourteen (14) new facilities will be constructed adjacent to existing facilities.

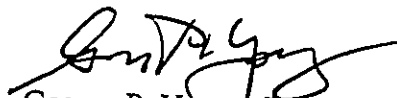
Due to the preliminary nature of the information provided, it is not possible to reach a conclusive determination whether any of the new facilities would require a Department of the Army (DA) permit. For your reference, the proposed work will not require a DA permit provided the new facilities are constructed on uplands and the project will not involve any other activity which will result in the discharge of dredge or fill material into jurisdictional waters of the U.S., including wetlands. A final determination regarding DA permit requirements for this project will be made after our office has had the opportunity to review the Environmental Assessment (EA).

Also, in order to avoid delays to inquiries regarding work in waters of the U.S., to include wetlands, all correspondence should be sent to the following address:

U.S. Army Engineer District, Honolulu
Regulatory Branch (CEPOH-EC-R)
Bldg 230
Fort Shafter, Hawaii 96858

Thank you for the opportunity to review the preliminary project scope. Please provide our office a copy of the draft EA when it is available. File No. 200300378 is assigned to this project. Please refer to this number in any future correspondence with our office. Should you have questions, you may contact Ms. Lolly Silva of my staff at (808) 438-7023 or by fax at (808) 438-4060.

Sincerely,


George P. Young, P.E.
Chief, Regulatory Branch

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9. COMMENTS AND RESPONSES ON
THE DRAFT EA

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

9.0 COMMENTS AND RESPONSES ON THE DRAFT EA

The availability of the Draft EA was published in the OEQC *The Environmental Notice* on July 8 and comments were received during the 30-day public comment period from July 8 through August 7, 2003. The comment letters and the applicant's responses are attached in this section.

9.1 DISTRIBUTION OF THE DRAFT EA

The Draft EA was circulated to public agencies, community organizations, and individuals pursuant to the DOH Section 11-200-9.1. Asterisks (*) indicate responses received; these letters are attached in this section.

COUNTY OF HAWAII

County Council
Department of Environmental Management *
Department of Parks and Recreation *
Department of Public Works*
Department of Research and Development
Department of Water Supply
Fire Department*
Legislative Auditor's Office
Planning Department

STATE OF HAWAII

Department of Accounting and General Services*
Department of Agriculture
Department of Business, Economic Development and Tourism – Planning Office
DBEDT – Energy, Resources and Technology Division
Department of Defense
Department of Hawaiian Home Lands
Department of Health*
Department of Land and Natural Resources*
Department of Land and Natural Resources – State Historic Preservation Division
Department of the Interior – Water Resources Division
Department of Transportation
Office of Environmental Quality Control*
Office of Hawaiian Affairs

Federal Agencies

US Department of the Army - Army Engineer Division
US Department of Transportation - Federal Aviation Administration*
US Department of Transportation – United States Coast Guard
US EPA – Pacific Islands Contact Office

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

US Fish and Wildlife Service⁶
US National Park Service

ORGANIZATIONS

Amateur Radio Emergency Service – Emergency Coordinator
Hawaii Leeward Planning Conference
HELCO – Engineering Department
Honokaa Business Owner’s Association
KAKOO
Kamehameha Schools Bishop Estate – Land Manager
Kobayashi, Sugita & Goda
Kona Crime Prevention Committee – Communications Chairman
Kona-Kohala Chamber of Commerce
Naalehu Main Street
South Kohala Traffic Safety Committee
Volcano Community Association
Waimea Community Association
W.H. Shipman, Ltd.

LIBRARIES / NEWSPAPERS

Bond Memorial Pubic Library (Kohala)
Hilo Public Library
Honokaa Public Library
Kailua-Kona Public Library
Keaau Public Library
Kealakekua Public Library
Naalehu Public Library
Thelma Parker Memorial Public & School Library
University of Hawaii at Hilo Library
University of Hawaii at Manoa - Hamilton Library

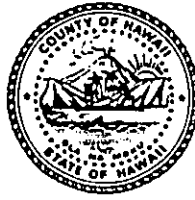
Hawaii Tribune Herald, Ltd.
West Hawaii Today

9.2 COMMENT LETTERS RECEIVED AND THE APPLICANT’S RESPONSES

The comment letters which were received and the Hawaii Police Department’s responses are attached.

⁶ Consultation was initiated with USFWS and coordinated through the environmental assessment preparation period to discuss issues related to native seabirds.

Harry Kim
Mayor



Barbara Bell
Director

County of Hawaii
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
25 Aupuni Street, Room 208 • Hilo, Hawai'i 96720-4252
(808) 961-8083 • Fax (808) 961-8086

July 15, 2003

Ms. Yukie Ohashi
PBR Hawai'i
101 Aupuni Street, Suite 310
Hilo, HI 96720

Re: County of Hawai'i Digital Upgrade Microwave Project
(Emergency Radio Facilities)
Draft Environmental Assessment

Dear Ms. Ohashi,

We have reviewed the above subject document and our comments are attached.

I am enclosing my comments for your review and action where appropriate.

If I can be of further assistance, please don't hesitate to contact me.

Sincerely,

Barbara Bell
DIRECTOR

cc: Christopher J. Yuen, Planning Director, County of Hawaii
SWD

enclosure



DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
SOLID WASTE DIVISION

COUNTY OF HAWAII - 108 RAILROAD AVENUE - HILO, HI 96720
HILO (808) 961-8339 WAIMEA (808) 887-3018 KONA (808) 327-3507

Date: 7/10/03

MEMORANDUM

TO: Christopher Yuen, Director
Planning Department

FROM: R. Gonsalves
Solid Waste Division

SUBJECT: SOLID WASTE MANAGEMENT PLAN

Relating to the subject application for County of Hawaii this division has

a) NO _____ comments DIGITAL UPGRADE MICROWAVE PROJECT
EMERGENCY RADIO FACILITIES

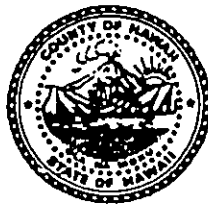
and/or

(b) THE FOLLOWING clarifications/comments, as indicated: SEE BELOW

- () Commercial operations may not use transfer stations for disposal.
- () Aggregates and any other construction/demolition waste should be reused to its fullest extent.
- () Ample room should be provided for recycling.
- () Greenwaste may be disposed of only at the drop sites located at the Kailua and Hilo Transfer Stations.

- IDENTIFY (IF ANY) DEMOLITION OF ANY EXISTING TOWERS AND COMPONENTS AND ITS DISPOSAL PROCESS AND FINAL DESTINATION
 - IF REPAIRING - IDENTIFY AND DESCRIBE PROCESS - TO COMPONENTS AND TOWERS
 - IDENTIFY HEALTH HAZARDS AND ITS DISPOSALS OF LEAD PAINT AND OTHER HAZARDOUS MATERIAL
 - REGULATORY PERMITS AND PROCESS TO DISPOSE
- _____
- _____

Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

TO: BARBARA BELL, DIRECTOR
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

FROM: *T. L. Osorio*
ELROY T. L. OSORIO, MAJOR, TECHNICAL SERVICES

SUBJECT: COUNTY OF HAWAII DIGITAL UPGRADE MICROWAVE PROJECT
RESPONSE TO COMMENTS ON THE DRAFT ENVIRONMENTAL
ASSESSMENT

Thank you for providing your comment letter dated July 15, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities. The following responds to your comments:

1. Demolition of facilities, disposal process, and final destination

The existing facilities at 13 locations will be replaced by new facilities and will require demolition and disposal. The components include tower structures, antennas, shelters, radio equipment, lines, equipment racks, generators, and fuel tanks. The target date for the demolition/removal is December 31, 2004 after the new radio system has been tested and properly operating.

Prior to demolition, an assessment for hazardous materials will be conducted at each site and a disposal plan will be prepared. All equipment and materials will remain at the current locations until the assessment and plan are completed. The results of the assessment will determine whether the removed structures and equipment can be recycled or taken to a landfill.

Recycling. Batteries and fuel tanks are planned to be recycled to an approved vendor. The steel from the towers, if found free of any hazardous paint, may be recycled by a scrap metal dealer on the island. Similarly, the fiberglass shelters, if found free of hazardous materials will be recycled. Any un-useable radio equipment, racks, antennas, lines, and generators would also be recycled to a scrap metal dealer on the island.

Disposal Process. Towers and shelters will be dismantled by cranes, cut up and hauled off to an appropriate facility for recycling and/or landfill.

Disposal Area. The final destination for the components will be determined by the assessment and disposal plan. The disposal area required will depend on how much of the materials can be recycled.

2. Refurbishing process

There are a total of five sites that have been identified for refurbishment. The process of refurbishing the towers involves strengthening by bolting/welding steel members to the existing structures to accommodate the weight of the new antennas and lines, if necessary. The shelters will be upgraded to handle the new electrical loads, new batteries, floors replaced, buildings resealed, etc, as necessary.

3. Health hazards and disposal of hazardous materials

All towers and shelters will be assessed for any hazardous materials before demolishing. If a hazardous material such as asbestos or lead paint is identified, appropriate measures will be taken to dismantle or contain the hazardous material. The disposal location would be at an approved landfill facility and documented appropriately to identify the hazards.

If no hazardous material is identified, the material will be cut up in appropriate sections and hauled off to a licensed landfill or to scrap metal dealer on the island for recycling.

All microwave equipment would be disconnected, and thus, there would be no health hazards associated with potential radiation exposure.

4. Regulatory permits and process to dispose

Regulatory permits. Applications to State and County agencies have been submitted and are currently under review. The regulatory process and required permits are described in Section 3 of the Draft and Final EA. All applicable requirements of these permits will be followed.

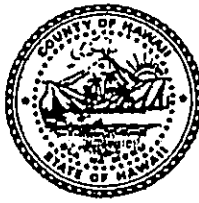
MEMORANDUM TO BARBARA BELL
PAGE 3
AUGUST 21, 2003

Process to dispose. Upon completion of our assessment and preparation of the disposal plan, the County's contractor will contact your Solid Waste Division staff prior to its implementation.

We will work with you on identifying appropriate disposal locations for any material that cannot be recycled. Thank you for participating in the environmental review process.

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Harry Kim
Mayor



Patricia G. Engelhard
Director

Pamela N. Mizuno
Deputy Director

County of Hawai'i
DEPARTMENT OF PARKS AND RECREATION
101 Pauahi Street, Suite 6 • Hilo, Hawai'i 96720
(808) 961-8311 • Fax (808) 961-8411

August 1, 2003

Major Elroy Osorio
Hawai'i Police Department
County of Hawai'i
349 Kapiolani Street
Hilo, Hawai'i 96720

Subject: County of Hawai'i – Digital Upgrade Microwave Project
Draft Environmental Assessment

Dear Major Osorio:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment "EA".

Our remarks pertain specifically to the Kamehameha Park site as this is the only site under the jurisdiction of or that affects our department.

It is our prior understanding that the existing tower and appurtenant shelter structure, fencing, equipment and accessories would be demolished and removed under the proposed project. However, narrative and illustrative content of the Draft EA references the removal of the existing tower and antenna only. Please confirm that all existing appurtenances will be removed such that only the proposed new improvements will be present on the site.


We are currently in the preliminary design phase of an accessibility improvement project for the Kamehameha Park site required by the Americans with Disabilities Act. The project will consist of site and building improvements for compliance with the County's Transition Plan and the Americans with Disabilities Act Accessibility Guidelines (ADAAG). In reviewing the information in the Draft EA we could not identify any improvements related to accessibility issues or ADAAG. If there are any considerations that would need to be made in our current project as it relates to accessibility of your proposed project, please let us know. Also, it is our recommendation that upon preparation of the proposed construction plans and prior to installation, you submit them for review by the State of Hawai'i's Disability and Communication Access Board (DCAB) as required by Hawai'i Revised Statutes §103-50.

Major Elroy Osorio
COH-Digital Upgrade Microwave Project

August 1, 2003

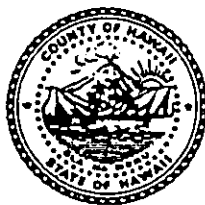
Please call our Staff Planner, James Komata at 961-8531 should you have any questions or wish to discuss our concerns in more detail.

Respectfully,


Patricia Engelhard
Director

Copy: Office of Environmental Quality Control (via U.S. Mail)
Harry S. Kubojiri/Hawai'i Police Department (via Interoffice Mail)
PBR Hawai'i (via U.S. Mail)

Harry Kim
Mayor



Lawrence K. Mahuna —
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

TO: PATRICIA ENGLEHARD, DIRECTOR
DEPARTMENT OF PARKS AND RECREATION
Elroy T. L. Osorio
FROM: ELROY T. L. OSORIO, MAJOR, TECHNICAL SERVICES
SUBJECT: COUNTY OF HAWAII DIGITAL UPGRADE MICROWAVE PROJECT
RESPONSE TO COMMENTS ON THE DRAFT ENVIRONMENTAL
ASSESSMENT

Thank you for providing your comment letter dated August 1, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities. The following responds to your comments which are specifically focused on the replacement radio system and facility at Kamehameha Park.

1. Clarification on the proposed improvements

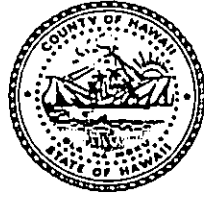
The proposed (new) improvements for the Kamehameha Park facilities include a new monopole tower, shelter and radio equipment, generator, fuel tank, and fencing. All of the existing (old) components will be removed. The removal of the existing components is expected to be by December 31, 2004 after the new radio system has been tested and properly operating. The FEA will clarify on Figure 14D that all existing components will be removed.

2. Americans with Disabilities Act

We are presently in the process of coordinating a review with the State Disability and Communication Access Board (DCAB) with regard to the Americans with Disabilities Act Accessibility Guidelines (ADAAG) pursuant to Hawaii Revised Statutes, Section 103-50.

Thank you for your continued coordination with us on any issues related to Kamehameha Park. We appreciate your participation in the environmental review process.

Harry Kim
Mayor



Bruce C. McClure
Director

Ronald K. Takahashi
Deputy Director

County of Hawaii
DEPARTMENT OF PUBLIC WORKS
Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawaii 96720-4224
(808) 961-8321 · Fax (808) 961-8630


August 7, 2003

Major Elroy Osorio
Police Department
County of Hawaii
349 Kapiolani Street
Hilo, Hawaii 96720

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
Digital Upgrade Microwave Project (Emergency Microwave Project)
TMKs: Various (19 Locations)

We have reviewed the subject DEA forwarded by your letter received July 7, 2003 and have no comments or objections to the request.

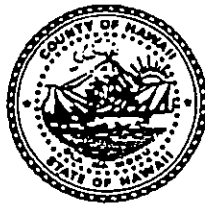
Questions may be referred to the Engineering Division at 961-8327 in Hilo, or at 327-3530 in Kona.


for GALEN M. KUBA, Division Chief
Engineering Division

KG

c: Office of Environmental Quality Control
Ms. Yukie Ohashi

Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

TO: GALEN M. KUBA, DIVISION CHIEF
ENGINEERING DIVISION, DEPARTMENT OF PUBLIC WORKS

FROM: *Elroy T. L. Osorio*
ELROY T. L. OSORIO, MAJOR, TECHNICAL SERVICES

SUBJECT: COUNTY OF HAWAII DIGITAL UPGRADE MICROWAVE PROJECT
RESPONSE TO COMMENTS ON THE DRAFT ENVIRONMENTAL
ASSESSMENT

Thank you for providing your comment letter dated August 7, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities. We note that you have no comments or objections to the request.

We appreciate your participation in the environmental review process.

Harry Kim
Mayor



Darryl J. Oliveira
Fire Chief

Desmond K. Wery
Deputy Fire Chief

County of Hawai'i

FIRE DEPARTMENT

25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720
(808) 961-8297 • Fax (808) 961-8296

July 23, 2003

Major Elroy Osorio
Hawaii Police Department
County of Hawaii
349 Kapiolani Street
Hilo, HI 96720

Dear Major Osorio:

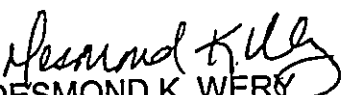
RE: COUNTY OF HAWAII DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

This responds to your request for comments regarding the Draft Environmental Assessment for the above-referenced project.

We have no comments to offer at this time concerning this proposal.

Thank you for the opportunity to participate in the planning stages of the project.

Sincerely,

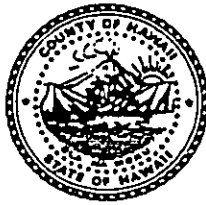

DESMOND K. WERY
Deputy Fire Chief

RK:lk

cc: Office of Environmental Quality Control
Mr. Harry S. Kubojiri, Deputy Police Chief
Ms. Yukie Ohashi, PBR Hawaii



Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief


Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

TO: DESMOND K. WERY, DEPUTY FIRE CHIEF
FIRE DEPARTMENT

FROM: 
ELROY T. L. OSORIO, MAJOR, TECHNICAL SERVICES

SUBJECT: COUNTY OF HAWAII DIGITAL UPGRADE MICROWAVE PROJECT
RESPONSE TO COMMENTS ON THE DRAFT ENVIRONMENTAL
ASSESSMENT

Thank you for providing your comment letter dated July 23, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities. We note that you have no comments at this time.

We will continue to coordinate with you on the planning and design of the replacement radio system. Thank you for your participation in the environmental review process.

LINDA LINGLE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF ACCOUNTING
AND GENERAL SERVICES
P.O. BOX 119
HONOLULU, HAWAII 96810-0119

AUG 08 2003 10:21 AM

RUSS K. SAITO
Comptroller

KATHERINE H. THOMASON
Deputy Comptroller

DR 04.0006

August 7, 2003

Major Elroy Osorio
Hawaii Police Department
County of Hawaii
349 Kapiolani Street
Hilo, Hawaii 96720

Dear Major Osorio:

Subject: County of Hawaii Digital Microwave Upgrade Project (Emergency Radio Facilities)
Environmental Assessment

The Department of Accounting and General Services (DAGS) appreciates this opportunity to comment on the Draft Environmental Assessment for the County of Hawaii Digital Microwave Upgrade Project. We have the following comments:

1. Table 2, page 14, should be corrected to indicate the new "install" tower height of the DAGS project at Kahua Ranch to be 70-feet tall.
2. Although not a direct contributor to the project, the DAGS construction of the facility at Kahua Ranch, which will be made available for County of Hawaii use at no cost, should be acknowledged in Section 2.6.5, page 22, as providing a cost avoidance.
3. Potential impacts from tsunami inundation, if any, to the Fire Central location or other locations, as well as mitigation measures, if any, should be discussed.
4. Once the new construction at Hamakua Police Station is completed, will the existing 80-foot tall monopole be removed?
5. Once the new construction at Iolehaeae is completed, will the existing 40-foot tall guyed tower be removed? Will this project also remove the abandoned small grid dish antenna and stub pipe mount located near the existing tower as part of this project?
6. Although the tower at the Waimea Police Station is indicated as a three-leg, self-supporting tower, it is misidentified as a monopole in the second paragraph in Section 2.7.20, page 132.

Major Elroy Osorio
August 7, 2003
Page 2

7. The authority for the disposition or use of State properties that are not DAGS facilities rests with the Department of Land and Natural Resources.

We applaud this effort to upgrade this key infrastructure that supports the public safety communications of the County of Hawaii as well as many agencies from both the State and federal government.

If you have any questions, please call Lester Nakamura, Information and Communication Services Administrator, at (808) 586-1910.

Sincerely,



RUSS K. SAITO
State Comptroller

- c: Harry M. Yada, Hawaii District Land Agent
Department of Land and Natural Resources, Hawaii District Land Office

Lester Nakamura, Administrator
DAGS Information and Communication Services Division

Alan Yamanoha, Planning Branch Project Coordinator
DAGS Public Works

Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

Mr. Russ K. Saito, State Comptroller
State of Hawaii
Department of Accounting and General Services
PO Box 119
Honolulu, Hawaii 96810-1019

**SUBJECT: County of Hawaii Digital Upgrade Microwave Project
Response to Comments on the Draft Environmental Assessment**

Thank you for providing your comment letter dated August 7, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities. The following responds to your comments:

1. The tower structure "install" height at Kahua Ranch is corrected in the Final EA as 70-ft.
2. The County of Hawaii appreciates the opportunity provided by DAGS to co-locate our equipment at the State's Kahua Ranch radio facility. The following statement is included in the Final EA Section 2.6.5 Preliminary Cost Estimate:

"The Department of Accounting and General Services construction of the Kahua Ranch facility will be made available for County of Hawaii use at no cost, thus, providing a cost reduction to the County. The costs to the County will include the purchase of equipment, engineering and installation of the equipment."

3. The Final EA has clarified that sites within the tsunami inundation area, including Fire Central, will be constructed in accordance with County requirements.


Mr. Russ K. Saito, State Comptroller
Page 2
August 21, 2003

4. The existing monopole at Hamakua Police Station will be removed after the new facility has been tested and properly operating. The target date for removal is December 31, 2003.
5. The existing guyed tower at Iolehaehae will be removed after the new facility has been tested and properly operating. Also to be removed is the inactive County Fire Department's 900 MHz microwave antenna (small grid dish antenna and stub pipe mount).
6. The Waimea Police Station tower structure is correctly identified as a self-supporting tower in Section 2.7.20 of the Final EA.
7. We note your comment regarding the authority for the disposition or use of State properties and have clarified the landownership in the Final EA, Section 1, Table 1.
 - The following sites are under the authority of DAGS: Captain Cook Police Station, Hamakua Police Station, Waimea Police Station.
 - The following sites are under the authority of DLNR Land Division: Iolehaehae and Kauna Point.

The Hawaii Police Department appreciates the collaboration with the State to accomplish this major undertaking to improve public safety in Hawaii County. We thank you for your participation in the environmental review process.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF


ELROY T. L. OSORIO
MAJOR, TECHNICAL SERVICES

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801-3378

RECEIVED

2003 AUG 13 PM 1:27

HAWAII POLICE

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
File:

August 12, 2003

Major Elroy Osorio
Hawaii Police Department
County of Hawaii
349 Kapiolani Street
Hilo, Hawaii 96720

Dear Major Osorio:

**SUBJECT: Comments to the County of Hawaii Digital Microwave Project
Draft Environmental Assessment
19 Project Locations, Island of Hawaii**

Our comments should be printed as follows:

"Project activities shall comply with the Administrative Rules of the Department of Health:

- Chapter 11-46 Community Noise Control.

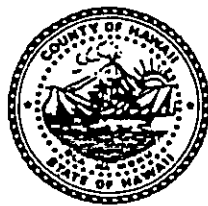
Should there be any questions, please contact me at 586-4701.

Sincerely,

Russell S. Takata
for Russell S. Takata
Program Manager
Noise, Radiation & IAQ Branch

AUG 14 2003

Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

Mr. Russell S. Takata, Program Manager
Noise, Radiation & IAQ Branch
State of Hawaii
Department of Health
PO Box 3378
Honolulu, Hawaii 96801-3378

**SUBJECT: County of Hawaii Digital Upgrade Microwave Project
Response to Comments on the Draft Environmental Assessment**

Thank you for providing your comment letter dated August 12, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities. The following responds to your comments:

The Final EA will cite the following in Section 4.1.9 Noise:

"The project activities shall comply with the Administrative Rules of the Department of Health: Chapter 11-46 Community Noise Control."

We thank you for your participation in the environmental review process.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF


ELROY T. L. OSORIO
MAJOR, TECHNICAL SERVICES

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

July 31, 2003

LD-NAV
DEAMICROWAVEHPD.RCM

PBR Hawaii
Yukie Ohashi
101 Aupuni Street, Suite 310
Hilo, Hawaii 96720

Dear Ms. Ohashi:

SUBJECT: Draft Environmental Assessment
County of Hawaii Digital Upgrade Microwave Project

Thank you for the opportunity to review and comment on the subject matter.

The Department of Land and Natural Resources' (DLNR) Land Division distributed a copy of your letter (summary of the project) and site map to the following DLNR Divisions for their review and comment:

- Division of Forestry and Wildlife
- Division of State Parks
- Engineering Division
- Commission on Water Resource Management
- Office of Conservation and Coastal Lands
- Land Division Maui District Land Office

Attached is a copy of the Engineering Division comment.

The Department of Land and Natural Resources has no other comment to offer.

If you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 1-808-587-0384.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Dierdre S. Mamiya".

DIERDRE S. MAMIYA
Administrator

C: MDLO

LINDA LINGLE
GOVERNOR OF HAWAII



2003 JUL 29 AM 11:48
DEPARTMENT OF LAND AND NATURAL RESOURCES

LAND DIVISION
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII
PO BOX 621
HONOLULU, HAWAII 96809

July 7, 2003

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

LD/NAV

Ref.: DEAMICROWAVEHPD.CMT

Suspense Date: 7/21/03

MEMORANDUM:

TO:

- XXX Division of Forestry & Wildlife
- XXX Division of State Parks
- ✓XXX Engineering Division
- XXX Office of Conservation and Coastal Lands
- XXX Land-Hawaii District Land Office

FROM: Deirdre S. Mamiya, Administrator
Land Division

SUBJECT: Draft Environmental Assessment (DEA)
County of Hawaii Digital Upgrade Microwave Project
Upgrade Existing Emergency Radio Facilities at 19 Island
Wide Locations - County of Hawaii Police Department
Consultant: PBR Hawaii (Ms. Yukie Ohashi 808-985-2222)

Please review the DEA pertaining to the subject matter and submit your comments (if any) on Division letterhead signed and dated by the suspense date.

If you have any questions, please contact Nicholas A. Vaccaro at ext.: 7-0384.

Note: One (1) copy of the document (DEA) is available for your review in the Land Division Office, Room 220.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments.

() We have no comments.

Comments attached.

Division _____

Signed: [Signature]

Date: _____

Title: Chief Engineer

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/NAV

Ref: SMA03-007.CMT

COMMENTS

We confirm that the project sites are located in Zones X (unshaded) and AE. Zone X is an area determined to be outside the 500-year flood plain. The National Flood Insurance Program (NFIP) does not have any regulations or guidelines for development within Zone X. Zone AE (Floodway) is an area where base elevations are determined and the NFIP strictly regulate development within a designated "Floodway". Please refer to Title 44 of the Code of Federal regulations for all applicable regulations.

If there are questions regarding the NFIP, please contact the State Coordinator, Mr. Sterling Yong, of the Department of Land and Natural Resources at 587-0248. If there are questions regarding flood ordinances, please contact Mr. Kelly Gomes at 961-8327 (Hilo) or Mr. Kiran Emler at 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

Should you have any questions, please call Mr. Andrew Monden of the Planning Branch at 587-0229.

Signed:



ERIC T. HIRANO, CHIEF ENGINEER

Date:

7/29/03

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 7, 2003

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

LD/NAV

Ref.: DEAMICROWAVEHPD.CMT

Suspense Date: 7/21/03

MEMORANDUM:

TO:

- XXX Division of Forestry & Wildlife
- XXX Division of State Parks
- XXX Engineering Division
- XXX Office of Conservation and Coastal Lands
- XXX Land-Hawaii District Land Office

FROM: Deirdre S. Mamiya, Administrator
Land Division

SUBJECT: Draft Environmental Assessment (DEA)
County of Hawaii Digital Upgrade Microwave Project
Upgrade Existing Emergency Radio Facilities at 19 Island
Wide Locations - County of Hawaii Police Department
Consultant: PBR Hawaii (Ms. Yukie Ohashi 808-985-2222)

Please review the DEA pertaining to the subject matter and submit your comments (if any) on Division letterhead signed and dated by the suspense date.

If you have any questions, please contact Nicholas A. Vaccaro at ext.: 7-0384.

Note: One (1) copy of the document (DEA) is available for your review in the Land Division Office, Room 220.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments.

We have no comments.

Comments attached.

Division _____

Signed: 

Date: JUL - 9

Title: **MICHAEL G. BUCK, ADMINISTRATOR**
DIVISION OF FORESTRY AND WILDLIFE

Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

Ms. Dierdre S. Mamiya, Administrator
State of Hawaii
Department of Land and Natural Resources
Land Division
PO Box 621
Honolulu, Hawaii 96809

**SUBJECT: County of Hawaii Digital Upgrade Microwave Project
Response to Comments on the Draft Environmental Assessment**

Thank you for providing your comment letter dated July 31, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities.


We note the comment provided by the Engineering division:

Zone AE (Flood way) National Flood Insurance Program (NFIP) regulations. The design of the facilities within the AE Floodway areas will be in accordance with NFIP regulations as described in Title 44 of the Code of Federal Register.

Thank you for your participation in the environmental review process.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF


ELROY T. L. OSORIO
MAJOR, TECHNICAL SERVICES

LINDA LINGLE
GOVERNOR OF HAWAII



AUG 07 2003 1:21 PM

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@health.state.hi.us

August 7, 2003

Major Elroy Osorio
County of Hawai'i Police Department
349 Kapi'olani Street
Hilo, Hawai'i 96720

Ms. Yukie Ohashi
PBR Hawai'i
101 Aupuni Street, Suite 310
Hilo, Hawai'i 96720

Dear Major Osorio and Ms. Ohashi:

The Office of Environmental Quality Control has reviewed the draft environmental assessment for the proposed digital microwave upgrade project for the County of Hawai'i Police Department at various locations and districts throughout the island of Hawai'i and offer the following comments for your consideration:

1. **INDIRECT AND CUMULATIVE IMPACTS OF THE PROPOSED PROJECT ON FUTURE COLLOCATION OF COMMUNICATIONS ANTENNAE.** Section 2.8.3 discusses collocation opportunities. Please expound on the potential for collocation of antennae and other devices for non-police use of the towers, especially in light of increasing urbanization in the North Kona and South Kohala Districts and any indirect impacts such collocation may lead to.
2. **INDIGENOUS AND POLYNESIAN INTRODUCED PLANTS FOR USE IN PUBLIC LANDSCAPING:** Please consider the use of native, indigenous and polynesian introduced plants in restorative landscaping.
3. **GUIDELINES FOR SUSTAINABLE BUILDING DESIGN IN HAWAII:** We ask that you consider implementing some of the techniques discussed in the enclosed guidelines for sustainable building design.
4. **USE OF RECYCLED GLASS:** To promote the use of recycled materials in-state as found in section 103D-407, Hawai'i Revised Statutes, we ask that you consider using materials with minimum recycled glass content in the design.

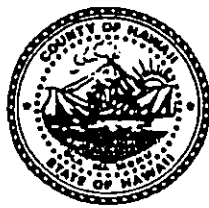
Thank you for the opportunity to comment. If there are any questions, please call Leslie Segundo of my staff at (808) 586-4185.

Sincerely,

A handwritten signature in cursive script that reads "Genevieve Salmonson".

GENEVIEVE K. SALMONSON
Director

Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

Ms. Genevieve K. Salmonson, Director
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

**SUBJECT: County of Hawaii Digital Upgrade Microwave Project
Response to Comments on the Draft Environmental Assessment**

Thank you for providing your comment letter dated August 7, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities. The following responds to your comments:

1. *Indirect and cumulative impacts of the proposed project on future co-location of communications antennas.* The Draft EA Section 2.8.3 Future Co-Location Opportunities states the County's recognition of co-location as a means of minimizing environmental impacts by reducing the number of tower facilities versus duplicating unnecessary facilities. In that regard, the indirect and cumulative impacts on the environment are lessened. The FEA will expand the discussion of this matter in appropriate sections, including Section 4.1.13 Co-Locating Agencies.
2. *Use of native and Polynesian-introduced plants in public landscaping.* Generally, landscaping of the radio sites would not be recommended due to the technical requirements of the system, however, in areas where landscaping would be appropriate, native and Polynesian-introduced plants would be considered.
3. *Guidelines for Sustainable Building Design.* The Guidelines will be reviewed by the contractor and applicable measures will be incorporated into the overall design of the project.

Ms. Genevieve K. Salmonson
Page 2
August 21, 2003

4. *Use of recycled materials.* The components of each facility are technically specialized, for example, tower structures and shelters are manufacturer produced to structurally withstand extreme environmental conditions and require specialized materials. Moreover, the securing of these structures in concrete will be specified by the project design engineer to withstand hurricane winds. As applicable, recycled materials pursuant to Section 103D-407, Hawaii Revised Statutes will be considered in the final design of the project.

We thank you for your participation in the environmental review process.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF


ELROY T. L. OSORIO
MAJOR, TECHNICAL SERVICES



U.S. Department
of Transportation
Federal Aviation
Administration

Western-Pacific Region
Real Estate and Utilities Section, AHNL-54B

P. O. Box 50109
Honolulu, Hawaii 96850-5000

August 8, 2003

Major Elroy Osorio
Hawaii Police Department
County of Hawaii
349 Kapiolani Street
Hilo, Hawaii 96720

Dear Major Osorio:

By letter from PBR Hawaii of July 8, 2003, you requested comments on the the Draft Environmental Assessment for the County of Hawaii Digital Upgrade Microwave Project (Emergency Radio Facilities).

The Federal Aviation Administration requests that a "Notice of Construction or Alteration", FAA Form 7460-1 be filed for each site so that a further analysis may be made. The form is available at our website <http://www.faa.gov>. It would also be helpful if you would identify any nearby airports and FAA facilities that you may be aware of on this form. As stated on the instructions to the form, please submit your proposals to the Western-Pacific Regional Office in Los Angeles, California and it will be forwarded for our local review.

After cursory review of your project, a concern was raised on the tower height proposed at the Kahua Ranch site as we have a Next Generation Weather Radar (NEXRAD) nearby. Also, it appears that there may be concerns possibly regarding the Hamakua Police Station, South Point, and Naalehu Pasture sites.

We appreciate this opportunity to comment and look forward to receiving your submittal. Please contact me on Oahu at 541-1236, if there are any questions.

Sincerely,

Darice B. N. Young
Realty Contracting Officer

cc:

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Hawaii Police Department
County of Hawaii
Attn: Harry S. Kubojiri, Deputy Police Chief
349 Kapiolani Street
Hilo, HI 96720

PBR Hawaii
101 Aupuni Street, Suite 310
Hilo HI 96720

Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

Ms. Darice B. N. Young, Realty Contracting Officer
US Department of Transportation
Federal Aviation Administration
Western-Pacific Region
Real Estate and Utilities Section, AHNL-54B
PO Box 50109
Honolulu, HI 96850-5000

**SUBJECT: County of Hawaii Digital Upgrade Microwave Project
Response to Comments on the Draft Environmental Assessment**

Thank you for providing your comment letter dated August 8, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities. The following responds to your comments:

1. *Notice of Construction or Alteration (FAA Form 7460-1.* As described in the Draft EA Section 3.4.2, the County's contractor, Scientel America, Inc, has completed submittal of FAA Form 7460-1 for the following sites:

The TOWAIR program has identified six sites that require Form 7460-1 review:

- Fire Central (proximity to Hilo International Airport)
- Hilo County Baseyard (proximity to Hilo International Airport)
- Kamehameha Park (proximity to Upolu Airport)
- Kulani Cone (structure will be taller than 200 feet)
- Public Safety Building (proximity to Hilo International Airport)
- Waimea Police Station (proximity to Waimea-Kohala Airport)

FAA determinations have been received for the following:

- Fire Central (No Hazard)
- Hilo County Baseyard (No Hazard)
- Kamehameha Park (No Hazard)
- Kulani Cone (Marking or Lighting required pursuant to FAA Advisory Circular 70/7460-1K)

Ms. Darice B. N. Young
Page 2
August 21, 2003

Pending determinations:


- Public Safety Building
- Waimea Police Station

2. *Hamakua Police Station, Naalehu Pasture, South Point facilities.* As a follow up to your letter, the County's contractor will be submitting Notice of Construction or Alteration (FAA Form 7460-1 for the facilities at Hamakua Police Station, Naalehu Pasture, and South Point facilities.
3. *Kahua Ranch facility.* The State of Hawaii Department of Accounting and General Services (DAGS), as the developer of the Kahua Ranch facility, is allowing the County of Hawaii to co-locate our radio system at this location. We are therefore, deferring your concern on the tower height to DAGS.

The Hawaii Police Department, through our contractor Scientel America, Inc., will continue to work with you on complying with the requirements of the FAA. We thank you for your participation in the environmental review process.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF


ELROY T. L. OSORIO
MAJOR, TECHNICAL SERVICES



W.H. SHIPMAN, LIMITED

KEAAU
HAWAII ISLAND

July 11, 2003

Major Elroy Osorio
Hawaii Police Department
County of Hawaii
349 Kapiolani Street
Hilo, Hawaii 96720

Dear Major Osorio:

Subject: Digital Upgrade Microwave Project (Emergency Radio Facilities)

Thank you for allowing us to review the subject draft environmental assessment. The following are our review comments for your consideration.

1. Paragraph 3.1 on page 143: The New Tower Height listed in Table 4 for the Puna Police Station should be changed to read "100 ft (mp)".
2. Paragraph 4.2.18.1 on page 195: The street name for the Puna Police Station should be changed to read "Pilimua".
3. Paragraph 4.2.18.3 on page 195: Under the Potential Impacts and Mitigative Measures for Visual Considerations, we ask that the following statement be added at the end of the paragraph: "The mono-pole antenna structure shall be designed to be easily relocated should a new Puna Police Station be built within the 20 year life expectancy of the antenna."

Should you have any questions, feel free to call me at 966-9325.


Jiro A. Sumada
Land Manager

cc: OEQC

Harry Kim
Mayor



Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

August 21, 2003

Mr. Jiro A. Sumada, Land Manager
W.H. Shipman, Ltd.
P.O. Box 950
Keaau, Hawaii 96749

**SUBJECT: County of Hawaii Digital Upgrade Microwave Project
Response to Comments on the Draft Environmental Assessment**

Thank you for providing your comment letter dated July 131, 2003 on the Draft EA for our proposed improvements to the County's emergency radio facilities.

1. *Items #1 and #2.* We note your comments and will make the appropriate corrections in the Final EA to the descriptions of the proposed facilities at the Puna Police Station. The FEA Section 3.1 Table 4 and Section 4.2.18.1 will be corrected as noted in your letter to reflect the 100-ft height of the "monopole" and the correct spelling of Pilimua Street, respectively.
2. *Future Re-location of Puna Police Station.* The County intends to upgrade the Puna Police Station in the near future; however, at this time a re-placement site has not been determined nor has funding been appropriated. At the time of specific planning for the new station, the radio facilities will be also planned to re-locate to the new site. As such, the FEA will state in Section 4.2.18.3 the following:


"Should a new Puna Police Station be built within the 20-year life expectancy of the proposed replacement radio facilities, the County will also re-locate the tower and antennas, equipment cabinet, and appurtenant structures to the new site."

Mr. Jiro A. Sumada
Page 2
August 21, 2003

Thank you for your participation in the environmental review process.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF


ELROY T. L. OSORIO
MAJOR, TECHNICAL SERVICES

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10. REFERENCES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

10.0 REFERENCES

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COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

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South Pacific Geotechnical, Inc. (April 2003). Geotechnical Engineering Reports. County of Hawaii Digital Microwave Relocation Project. Captain Cook Police Station Site, Central Fire Station Site, Hamakua Police Station Site, Iolehaehae Site, Kailua Police Station Site, Kamehameha Park Site, Kulani Cone Site, Moanuahea Site, Naalehu Pasture Site, New Kau Police Station Site, Ohia Mill Site, Puna Police Station Site. Kailua-Kona, Hawaii.

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11. APPENDICES



11.0 APPENDICES

- A BOTANICAL SURVEY
- A-1 MOANUIAHEA SITE ACCESS ROAD LETTER REPORT
- B WILDLIFE SURVEY
- B-1 IOLEHAEHAE AUDITORY SURVEY
- B-2 KAMEHAMEHA PARK, KAUNA POINT (MANUKA WAYSIDE), KULANI CONE
RADAR SURVEYS DATA SUMMARY
- B-3 USFWS INTERIM GUIDELINES FOR RECOMMENDATIONS ON
COMMUNICATIONS TOWER SITING
- C ARCHAEOLOGICAL AND CULTURAL IMPACT ASSESSMENT



Appendix A Botanical Survey

**BOTANICAL RESOURCES ASSESSMENT STUDY
COUNTY OF HAWAI'I DIGITAL MICROWAVE UPGRADE PROJECT
VARIOUS TMK PARCELS, COUNTY OF HAWAI'I**

by

Winona P. Char
CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: **PBR HAWAII**

May 2003

**BOTANICAL RESOURCES ASSESSMENT STUDY
COUNTY OF HAWAI'I DIGITAL MICROWAVE UPGRADE PROJECT
VARIOUS TMK PARCELS, COUNTY OF HAWAI'I**

INTRODUCTION

The County of Hawai'i is in the process of upgrading its emergency radio telecommunications facilities throughout the island. The existing system which was installed in the 1970's for police and fire communication functions is now out-dated and in need of replacement.

Fourteen (14) new facilities will be located directly adjacent to the existing facilities and five (5) will be refurbished for a total of nineteen (19) island-wide locations/sites. The upgrades will include new digital equipment and increased tower height for maximum signal strength. 01 facilities will be removed after the new facilities are in place and operating for a seamless transition and no disruption in emergency radio services.

Seven (7) sites are environmentally sensitive; the State Land Use zoning designation is Conservation or AG. The seven sites are: 'Iolehaehae, Na'alehu Pasture, South Point, Kauna Point, 'Ohi'a Mill, Moanuahea, and Kulani Cone.

Field studies to assess the botanical resources on the seven sites were made in March and April 2003. The primary objectives of the field studies were to:

- 1) prepare a general description of the vegetation on each site;
- 2) search for threatened and endangered species as well as species of concern;
and
- 3) identify areas of potential environmental problems or concerns and propose appropriate mitigation plans.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area around the sites. For the Kulani Cone site, database information from the Hawai'i Natural Heritage Program was examined. Topographic maps and soil maps (which are overlaid over a photobase) were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, disturbances, topography, exposure, etc., on each of the sites and immediately surrounding areas. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in

the herbarium, and for comparison with the recent taxonomic literature.

Field studies for the South Point, Na'alehu Pasture, 'Ohi'a Mill, and Moanuaiea sites were conducted on 29 March 2003. 'Iolehaehae was surveyed on 21 April 2003; the Kulani Cone survey was made on 22 April 2003; and Kauna Point was surveyed on 23 April 2003.

DESCRIPTION OF THE VEGETATION

The plant names used in this report follow Wagner *et al.* (1990) and Wagner and Herbst (1999) for the flowering plants. The few recent name changes for the flowering plants are those reported in the Hawaii Biological Survey series (Evenhuis and Eldredge, editors, 1999-2002). The ferns and fern allies are in accordance with the most recent treatment by Palmer (2003).

'Iolehaehae

The 'Iolehaehae site (TMK:4—1-006:007) is located at 8,121 ft. elevation on 'Iolehaehae pu'u (hill), a cinder cone. This is mapped as "rCL", cinder land, on the soil maps (Sato *et al.* 1973) and consists of bedded cinders, pumice, and ash with rock outcrops.

The 'Iolehaehae site is more or less level with loose red cinders and scattered rock outcrops. Vegetation cover is roughly 30 percent and consists primarily of somewhat stunted narrow-leaved plantain (*Plantago lanceolata*) and brome fescue (*Vulpia bromoides*), 2 to 4 inches tall. Scattered here and there are small patches and individual clumps of orchard grass or cocksfoot (*Dactylis glomerata*), velvet grass (*Holcus lanatus*), sheep sorrel (*Rumex acetosella*), sweet vernalgrass (*Anthoxanthum odoratum*), and hairy cat's ear (*Hypochoeris radicata*). Most of the grasses have been heavily grazed by cattle; the site and surrounding lands are used for pasture.

Native plants are associated with the rocky outcrops. A few pukiawe shrubs (*Styphelia tameiameia*), 3 to 5 ft. tall, and stunted, heavily browsed young mamane trees (*Sophora chrysophylla*), 1 to 3 ft. tall, occur here. Three small native ferns, the 'oali'i (*Asplenium trichomanes* subspecies *densum*), kalamoho lau li'i (*Pellaea ternifolia*), and 'iwa'iwa (*Asplenium adiantum-nigrum*) are quite common in this high elevation, open, dry rocky habitat.

The existing solar panels and a service shelter are located near the base of the cinder cone. In this more protected area there is some soil. The vegetation consists of low mats of Kikuyu grass (*Pennisetum clandestinum*) and narrow-leaved plantain.

Along the base of the cinder cone, outside of the project site, the vegetation consists of mamane forest, 12 to 18 ft. tall. This subalpine dry forest type is found principally on Hawai'i island, with lesser representation on East Maui. On Hawai'i, it occurs primarily

on Mauna Kea (Gagne and Cuddihy 1990). A brief walk-through of the mamane forest around the base of the 'Iolehaehae cinder cone found scattered plants of pukiawe, pilo (Coprosma montana), na'ena'e (Dubautia ciliolata), and the three fern species. Cattle and feral animals such as sheep, pigs, and goats have negatively impacted this forest type by eating seedlings, browsing on foliage, and stripping bark from trees. These animals have also fostered the introduction and spread of alien grasses and herbs (Cuddihy and Stone 1990).

The pukiawe shrub and kalamoho lau li'i and 'iwa'iwa ferns are indigenous species, that is, they are native to the Hawaiian Islands and elsewhere. The maniane, 'oali'i fern, and pilo and na'ena'e shrubs are endemic species, that is, they are native only to the Hawaiian Islands.

Na'alehu Pasture

The Na'alehu Pasture site (TMK:9-5—007:016) is located approximately 1.5 miles south of Na'alehu Town at 632 ft. elevation. The existing tower and support shelter and the proposed new tower site are located on a level area on top of a rocky hill or pu'u composed of pahoehoe lava. Part of the new tower will be placed on an existing unpaved access road.

The vegetation on top of the pu'u is patchy with large areas of barren, weathered pahoehoe. It consists of low clumps of Guinea grass (Panicum maximum) and scattered koa haole shrubs (Leucaena leucocephala), 1 to 3 ft. tall, with a few weedy species which include comb hyptis (Hyptis pectinata), bur bush (Triumfetta rhomboidea), Spanish needle (Bidens aiba var. radiata), false mallow (Malvastrum coromandelianum), partridge pea (Chamaecrista nictitans), Boerhavia coccinea, 'uhaloa (Waltheria indica), and Portulaca pilosa. Bermuda grass (Cynodon dactylon) forms a fair-sized mat around the existing tower. Most of the vegetation has been grazed by cattle.

Koa haole thicket, 6 to 12 ft. tall, with a few Christmas berry shrubs (Schinus terebinthifolius) is found on the sides of the pu'u where it is steeper and there are piles of large boulders. A few native plants occur among the boulders. These are the koali 'awa (Ipomoea indica), a member of the morning glory family; 'ilie'e (Plumbago zeylanica), a sprawling shrub with clusters of white flowers; and kakalaioa (Caesalpinia bonduc), a scandent shrub with yellow flowers and prickly young leaves. These three species plus the 'uhaloa mentioned in the previous paragraph are all indigenous, i.e., native to the Hawaiian Islands and elsewhere.

South Point

The South Point site (TMK:9-3-001:006) is located off of South Point Road at 1,206 ft. elevation in open pasture land. Soils on the site are well-drained, dark-brown loam that

formed from volcanic ash (Sato et al. 1973).

Kikuyu grass (Pennisetum clandestinuni) forms extensive mats, 4 to 6 inches thick, over the gently rolling terrain. Guinea grass (Panicum maximum) and smutgrass or African dropseed (Sporobolus africanus) are occasional, occurring as scattered clumps. All three grasses are native to tropical Africa and were originally introduced for forage. Neonotonia wightii, a twining perennial vine and member of the pea family, is occasional. It is native to tropical America and was brought in as a fodder plant. Other plants occur here in smaller numbers and include peppergrass (Lepidium virginicum), apple of Sodom (Solanum linnaeanum), slender amaranth (Aniaranthus viridis), wiregrass (Eleusine indica), goosefoot (Chenopodium murale), scarlet pimpernel (Anagallis arvensis), and popolo (Solanum americanum). Patches of lantana shrubs (Lantana camara), 2 to 3 ft. tall, are common in adjacent, low-lying swale areas.

The only native plant found on the site is the popolo, a member of the nightshade or tomato family. It is an indigenous species, occurring naturally in the Hawaiian Islands and in tropical and warm temperate areas.

Kauna Point (Kaiakēkua)

The existing tower and shelter are located adjacent to the 4-wheel drive road which goes down to Kaiakēkua along the coast; this is just north of Kauna Point. The project site (TMK:9-1-001:003) is located on an 'a'a lava flow at 100 ft. elevation.

The scoriaceous, clinkery, and jagged 'a'a lava drains very quickly and there are very few areas with shallow soil. Vegetation on this harsh substrate is very sparse; plant cover may be 5 percent in low-lying areas, but on most of the flow it is less than 1 percent or absent. Rainfall is less than 20 inches per year. Hardy native species adapted to this type of environment are 'ohi'a trees (Metrosideros polymorpha) -- which are about 12 to 18 ft. tall, maiapilo or native caper (Capparis sandwichiana), and 'uhaloa (Waitheria indica), a small shrub. Introduced or alien plants observed on the 'a'a flow include sourbush (Pluchea carolinensis), Natal redtop grass (Melinis repens), running pop (Passiflora foetida), and hairy sword fern (Nephrolepis multiflora).

On the fenced project site, there are no plants. Whitish-gray crusts of a Stereocaulon species, a native lichen, are found covering the 'a'a adjacent to the site.

Plans call for the tower to be refurbished so that it will withstand winds of 100 miles per hour or greater. If the tower needs to be replaced, then a new tower would be placed on the bulldozed access road next to the fenced area. There are no plants on the access road.

'Ohi'a Mill

The 'Ohi'a Mill site (TMK:8-8-001:003) is located about 1 1/4 mile mauka of Highway 11 at 2,355 ft. elevation on the Yee Hop Ranch, South Kona.

The existing tower and shelter are located on Kikuyu grass (Pennisetum clandestinum.) pasture land with scattered stands of 'ohi'a (Metrosideros polymorpha) and silk oak (Grevillea robusta) trees. Besides Kikuyu, other forage plants observed on the site include two legume or pea family members: Spanish clover (Desmodium incanum) and Neonotonia wightii, and African dropseed grass (Sporobolus africanus). Weedy species are associated with disturbed, exposed soil-covered patches and include vervain (Stachytarpheta australis), beardgrass (Schizachyrium condensatum), narrow-leaved plantain (Plantago lanceolata), nettle-leaved goosefoot (Chenopodium carinatum), pamakani (Ageratina riparia), and balloon plant (Asclepias physocarpa). Around the existing structures, there are a few ti leaf plants (Cordyline fruticosa).

'Ohi'a is the only native plant recorded from the site. It is endemic, i.e., native only to the Hawaiian Islands.

Moanuaiea

The Moanuaiea site (TMK:7-2-007:001) is located above the Makalei Golf Course at 3,214 ft. elevation. The project site and the surrounding lands are used for grazing cattle and horses. The Kikuyu grass (Pennisetum clandestinum)-covered pasture land is lush and thick due to the fairly deep, loamy soils and good amount of rainfall (50 to 100 inches per year). The pastures are well managed with only a few weedy shrubs such as Christmas berry (Schinus terebinthifolius) and guava (Psidium guajava). Forage species such as Spanish clover (Desmodium incanum), white clover (Trifolium repens), and African dropseed grass (Sporobolus africanus) are common to locally abundant. Weedy species occur in smaller numbers and include narrow-leaved plantain (Plantago lanceolata), weed verbena (Verbena litoralis), vervain (Stachytarpheta australis), and purple cudweed (Gamochaeta purpurea). A few clumps of the noxious fireweed (Senecio madagascariensis) are found here. It is a member of the daisy family with clusters of bright yellow flowers; it is unpalatable and, perhaps, toxic to livestock.

Cyperus polystachyos, a member of the sedge family, was the only native species recorded from the area around the existing tower and shelter and on the new tower site. Cyperus is indigenous; it is native to the Hawaiian Islands and tropical and subtropical regions worldwide.

Kulani Cone

The Kulani Cone site (TMK:9-9-001:024) is located above the Kulani Correctional Facility at 5,508 ft. elevation. The top of the cone where the existing tower and shelter are located has been graded in the past and is level in most places. Other communication towers are also located on the cone are identified on the U.S.G.S. quad

maps.

The level, open grassy places support a number of weedy species. These areas appear to be infrequently maintained. Around the existing tower and shelter, and on the new tower site, velvet grass (Holcus lanatus) is abundant, while other grasses such as broomsedge (Andropogon virginicus), beardgrass (Schizachyrium condensatum), and narrow-leaved carpetgrass (Axonopus fissifolius) are occasional. Along the westside of the project site, kikuyu grass (Pennisetum clandestinum) and ricegrass (Paspalum scrobiculatum) form lumpy, thick mats up to 4 ft. tall. Sedges and weedy herbaceous species found here include hairy cat's ear (Hypochoeris radicata), Cyperus polystachyos, beak-rush (Rhynchospora chinensis), and Polygonum capitatum.

Largely barren areas of packed soil and red cinders occupy about 40 percent of the site. Some are poorly drained with shallow pools of water and support clumps of Japanese mat rush (Juncus effusus) and Juncus tenuis. Other areas have tussocks of Thuidium and Calymperes moss.

Koa/'ohi'a montane wet forest (Gagne and Cuddihy 1990) occurs on the undisturbed sides of the cone and on the surrounding lands. This distinctly stratified native forest type has an uppermost layer consisting of an umbrella-shaped canopy of koa (Acacia koa) up to 130 ft. tall. 'Ohi'a (Metrosideros polymorpha) forms another layer up to 100 ft. tall, with a variety of native tree species such as 'olapa (Cheirodendron trigynum), kawa'u (Ilex anomala), kolea lau nui (Myrsine lessertiana), pilo (Coprosma ochracea), etc., 30 to 60 ft. tall. Hapu'u (Cibotium species) form a rather dense understory layer, 15 to 20 ft. tall. A variety of shade-tolerant shrubs such as kanawa'o (Broussaisia arguta), manono (Hedyotis terminalis), 'akala (Rubus hawaiiensis), and alani (Melicope species) are scattered throughout the understory. Ground cover consists of a number of shade-tolerant ferns such as Asplenium species, 'akolea (Athyrium microphyllum), ho'i'o (Diplazium sandwichianum), Dryopteris species, etc.; herbs which include 'ala'ala wai nui (Peperomia species), makole (Coprosma granadensis), Stenogyne species, etc.; and mosses and liverworts.

One endangered species (U.S. Fish and Wildlife Service 1999b), Phyllostegia velutina -- a member of the mint family with silky leaves, and one species of concern (U.S. Fish and Wildlife Service 1999a), Asplenium schizophyllum -- a fern with very finely dissected fronds, are recorded from Kulani. Cone (Hawai'i Natural Heritage Program database). These two species along with endangered Clermontia lindseyana and Hawaiian vetch (Vicia menziesii) are found on the adjacent Kilauea Forest Reserve and Pu'u Maka'ala Natural Area Reserve.

No threatened and endangered species or species of concern are found on the top of the cone where it has been disturbed. An earlier botanical survey of the cone (Char 1985) for a Hawaiian Telephone Company facility and improvements to the access road recorded similar findings. The disturbed areas support mostly introduced or alien plants, although a few native plants are occasionally found. These native plants tend to prefer the more open areas such as forest edges. Native plants observed on the project site

are the matted 'uluhe fern (Dicranopteris linearis), Cyperus polystachyos and beak-rush (Rhynchospora chinensis) sedges, he'upueo grass (Agrostis avenacea), waewae'iole (Lycopodiella cernua) --a fern ally, and saplings of 'ohi'a. The 'ohi'a is the only endemic species, all the others are indigenous.

DISCUSSION AND RECOMMENDATIONS

The vegetation around the existing towers and shelters and on the proposed new tower locations consists primarily of introduced or alien species, most of them weedy. Introduced species are all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, i.e., Cook's arrival in the islands in 1778. Kikuyu grass is the most abundant plant on pasture lands. Five of the sites: 'Iolehaehae, Na'alehu Pasture, South Point, 'Ohi'a Mill, and Moanuaiea, are used for grazing cattle and horses. The Kauna Point (Kaiakekua) site is located on a largely barren 'a'a lava flow. The Kulani Cone site is located in an area with koa/'ohi'a montane wet forest, but the summit of the cone has been leveled and graded in the past and, as a result, the vegetation is composed primarily of introduced grasses and weedy herbaceous species.

The area around each of the existing towers and proposed new tower sites has been disturbed in the past. In addition, telecommunication facilities for other government agencies and various companies are also found close by, resulting in a cluster of areas which have been disturbed, some of them bulldozed.

A few native plants are found on each of the sites or nearby. Most of them are indigenous (native to the Hawaiian Islands and elsewhere), while others such as the 'ohi'a (Metrosideros polymorpha), mamane (Sophora chrysophylla), and 'oali'i fern (Asplenium trichomanes subspecies densum) are endemic (native only to the Hawaiian Islands). None of the plants found on the seven sites surveyed is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1999a, 1999b; Wagner et al. 1999). All of them can be found in similar types of environments on Hawai'i.

The proposed County of Hawai'i Digital Microwave Upgrade Project is not expected to have a significant negative impact on the botanical resources. The only site of some concern is the Kulani Cone site as it is situated within an excellent example of koa/'ohi'a montane wet forest. All construction activities should be confined to the disturbed, grassy, level areas. Any excavated material should not be disposed of by pushing it over the side of the cone. All construction material should be removed when the new facilities are in place and operating. No replanting of vegetation is needed. The weedy plants already found on the adjoining grassy areas should colonize any newly disturbed spots.

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Appendix A-1 Moanuahea Site
Access Road Letter Report

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CHAR & ASSOCIATES

Botanical/Environmental Consultants

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

MEMORANDUM

TO Yukie Ohashi
FROM Winona P. Char
DATE 14 April 2003
SUBJECT Moanuaiahea Site Access Road

The Moanuaiahea site (TMK: 7-2-007: 001) is located above Makalei Golf Course at 3,217 feet elevation. A new 100-foot self support tower is proposed for the site. The unpaved access road to the Moanuaiahea site starts near the golf cart facilities and is gated. It passes through Kikuyu grass-dominated pasture lands as it winds its way upslope.

Woody vegetation along the access road will be removed or trimmed back in some places to allow passage of large equipment to the project site. An inspection of the vegetation along the access road was made on 29 March 2003 during the field studies for the Moanuaiahea tower site.

The vegetation along the access road consists of open, grassy pasture lands with scattered individual or small stands of trees and shrubs. Kikuyu grass (Pennisetum clandestinum) forms solid, lumpy mats, 1 to 2 feet tall. Locally common are clumps of African dropseed grass (Sporobolus africanus). Other plants occasionally observed along the dirt and grass-covered road include Guinea grass (Panicum maximum), Spanish clover (Desmodium incanum), comb hyptis (Hyptis pectinata), fountain grass (Pennisetum setaceum), weed verbena (Verbena litoralis), and narrow-leaved plantain (Plantago lanceolata). Woody components consist primarily of silk oak trees (Grevillea robusta), 12 to 25 feet tall. Shrubs of Christmas berry (Schinus terebinthifolius)

and guava (Psidium guajava) are common. Along the upper elevation portion of the access road, a few trees of 'ohi'a (Metrosideros polymorpha), 15 to 25 feet tall, are found.

No threatened and endangered species or species of concern (U.S. Fish and Wildlife Service 1999a, 1999b; Wagner et al. 1999) occur along the access road to the Moanuahea tower site. The clearing and trimming back of vegetation along portions of the access road are not expected to have a significant negative impact on the botanical resources. Similar vegetation exists on the pasture lands which border the access road and tower site.

Please do not hesitate to contact me should you have any questions regarding the findings in this report.

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- Wagner, W.L., M.M. Brueggemann, D.R. Herbst, and J. Q.C. Lau. 1999. Hawaiian vascular plants at risk: 1999. Bishop Museum Occasional Papers No. 60.



Appendix B Wildlife Survey



**Wildlife Survey
Emergency Telecommunications System
Digital Microwave Upgrade
County of Hawaii, Island of Hawaii**

Prepared for:
PBR Hawaii
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Prepared by:
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May 2003

INTRODUCTION

The County of Hawaii is planning to upgrade its existing emergency radio telecommunications system. The existing analog system was installed in the 1970's for emergency police, fire, and ambulance communications. Microwave repeaters are situated at key locations around the island to optimize coverage. Various commercial and governmental cellular, radio and remote monitoring systems are collocated with the county system. Towers supporting these systems are clustered at each location. The proposed project will replace 14 existing towers and refurbish 5.

Eight sites were determined to require wildlife assessments; these typically occurred in rural settings within Conservation or Agriculture Zones.

The objectives of the assessments were to describe the avian and mammalian species components at each site and determine whether threatened, endangered or sensitive species were present and if present determine the impact that the project would have on these species.

METHODS

Diurnal surveys of both avian and mammalian fauna were conducted at each site by walking around the immediate vicinity of the site (to an approximate radius of 100 yds). The actual survey period was typically between 30 minutes to one hour, depending on the vegetation and terrain of site, however total time spent at each site was about 2 hours. A tally of all avian and mammalian species was made at each site during the actual survey. Visual detection was aided with the use of an 8x32 pair of Pentax binoculars.

A single visit to a site will not yield all the faunal components for that site or habitat type, even under the best conditions. The presence and quantity of a wildlife species is influenced by many factors such as the time of day, season, and a host of environmental conditions, which include the presence of disturbances that can cause wildlife to move out of the area temporarily. Single visits, however, generally reveal what can be expected, based on previous anecdotal and scientific records of similar sites and habitats. The single visit is therefore important to verify and check the species components and the environmental characteristics which typify the site. Conclusions derived from these one time visits must, however, be interpreted conservatively.

Eight sites were visited from March 29 to May 5, 2003. Security restrictions prevented access to conduct the wildlife surveys during optimal times of the day. All surveys were conducted during daylight in conjunction with botanical surveys (Char 2003).

RESULTS AND DISCUSSION

Project Name: Iolehaehae, elev. 8,121 ft.

Iolehaehae is a cinder puu on the northeast slope of Mauna Kea, just east of the Mauna Kea Game Management Area boundary. The puu is being used as an antenna farm. The area surrounding the puu is used as pasturage for domestic cattle. A large reservoir is located to the north of the puu.

Iolehaehae falls within vegetation zone E2 of Ripperton and Hosaka (1942 in Schwartz and Schwartz 1949). The mean annual temperature of this zone is 42°F, with less than 40 inches of annual rainfall. Winds are principally tradewinds from the northeast. The topography is steep. Soils are not well weathered making poor substrata for plants. The zone is rocky with lava and cinder. Heavy grazing in the past by cattle and sheep has caused severe denudation of both vegetation and soil. There is sparse scrubby vegetation due to poor soil and rigorous climate. There are open grasslands and remnant stands of koa (*Acacia koa*) and mamani (*Sophora chrysophylla*). Aalii (*Dodonea* sp.) and pukeawe (*Styphelia tameiameia*) are common where trees have disappeared. Herbs are frequent but grazing limits maximum coverage (adapted from Ripperton and Hosaka 1942 in Schwartz and Schwartz 1949).

The wildlife survey was conducted on April 21, 2003 from 11:12 to 12:02 hours. Conditions during the survey were poor for audio detection of birds except on the lee side of the puu. Winds were from the northeast in excess of 25 mph with mist and light rain.

Domestic cattle (*Bos taurus*) were grazing in the area. Feral piglets (*Sus scrofa*) were seen in adjacent paddocks along with the cattle. There was no recent sign of feral sheep (*Ovis aries*) or mouflon (*Ovis musimon*), however they have been known to be in the area. While no feral cats (*Felis catus*) were observed they can be expected to be in the area. No small mammal trapping was conducted but the black rat (*Rattus rattus*) is probably the dominant rat species in the area but may occur in low numbers. The house mouse (*Mus musculus*) can also be expected although there was none seen during the survey.

The Draft Recovery Plan for the Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) (1997) showed bat sightings recorded near the vicinity of the site. The plan shows that bat sightings are well distributed throughout the island of Hawaii.

The area supported a number of naturalized game bird species. California valley quail (*Callipepla californica*), Erkel's francolin (*Francolinus erckelii*), chukar (*Alectoris chukar*), and kalij pheasant (*Lopura leucomelana*) were all observed in the immediate vicinity of the site during the survey. The area also supports turkey (*Meleagris gallopavo*) and ring-necked pheasant (*Phasianus*

colchicus) although none were observed during the survey. House finches (*Carpodacus mexicanus*) and Eurasian skylarks (*Alauda arvensis*) were present during the survey. The nests of House finches were found under solar panels at the site. The common barn owl (*Tyto alba*) was not observed but is expected to inhabit the area.

The endemic Amakihi (*Hemignathus virens*) was the most numerous species encountered. Apapane (*Himatione sanguinea*) were also present. Both species were seen foraging in the mamane trees on the lee side of the puu. While not observed, the federally listed endangered Palila (*Loxioides bailleui*), is expected in the area. The project site is in the vicinity of Palila Transect 115 and considered within the northern slope population (Gray et al. 1999). None of these birds move much at night, unless they are disturbed, therefore it is not likely that they are impacted negatively by the presence of the antenna farm.

No Hawaiian hawks (*Buteo solitarius*) were observed but Hawaiian hawks are widespread throughout all forest types including the mamane-naio (*Myoporum sandwicense*) woodland (Scott et al. 1986) and therefore could be expected in the area. The hawks will not be impacted by the project since they fly during the day and will be able to see the antenna. One Pacific golden plover (*Pluvialis dominica*) was encountered during the survey, while plovers are active both in the day and at night, it is unlike that plovers would hit the antenna. No pueo (*Asio flammeus*) was seen at the site, but the area is within their current distribution and many were seen foraging along the Mana Road in the surrounding pastures. Pueo will also be able to see the antenna whether flying in the day or night.

Berger (1972) mentions the endangered dark-rumped petrel (*Pterodroma phaeopygia*) at Kanakaleonui on Mauna Kea which is about 2 miles to the south of the Iolehaehae. Day et al. (2003) also suggests that the species may nest on Mauna Kea since there are records that suggest dark-rumped petrels from Hamakua and North Hilo Districts. They also suspect that they detected Newell's shearwaters at Akaka Falls, Pauuilo and Hilo sampling sites (Day et al. 2003). Day et al. (2003) conducted their radar studies of Newell's shearwaters and Hawaiian dark-rumped petrels on the Island of Hawaii during May 31 and June 15, 2001 and from June 14 to 22, 2002. Sampling was conducted between 19:00 and 22:00 hours (7:00 pm to 9:00 pm), which is the peak period of inland movement of the birds to their nesting colonies (Day et al. 2003).

Since the birds fly at night, it is reasonable to assume they can see structures such as an antenna and can avoid them. Studies conducted on Kauai by Cooper and Day (1992), indicate that "fallout" occurs when birds are disoriented by bright lights. Guy wires or powerlines appear to be a problem when they are located in conjunction with bright lights and heavily used flight routes. On Kauai, heavily used flight routes are typically valley bottoms and river mouths. The birds apparently have fairly good night vision, and they keep a safe distance from

structures unless disoriented by bright lights (USGC 2000). The shearwater is known, however, to hit powerlines that are within 325 ft (100m) from the coastline (Cooper and Day 1998). The Iolehaehae project will not have antenna guy wires nor powerlines, and is not near the coast, nor are there lights to disorient birds at night.

Project Name: Naalehu Pasture, elev. 632 ft.

The Naalehu Pasture site is on a rocky outcrop about 1.5 miles south of Naalehu town. Cattle are grazed in the surrounding area. A cattle corral is next to the site. The area appears highly disturbed.

The Naalehu Pasture site is within vegetation zone B of Ripperton and Hosaka (1942 in Schwartz and Schwartz 1949). The mean annual temperature is 70°F. Annual rainfall within this zone is 20-40 inches. The topography is characterized as coastal flats with adjacent sloping lands with lava common (adapted from Ripperton and Hosaka 1942 in Schwartz and Schwartz 1949).

The ground is rocky with pahoehoe lava. Guinea grass (*Panicum maximum*), Christmas berry (*Schinus terebinthifolius*) and haole koa (*Leucaena leucocephala*) are dominant plants. There is also uhaloa (*Waltheria indica*) which is an important food for seedeaters such as doves and other gamebirds.

The wildlife survey was conducted on March 29, 2003 from 08:11 to 08:46 hours. Weather condition during the survey was overcast with occasional drizzle. The small Indian mongoose (*Herpestes auropunctatus*) was seen during the survey. No feral cats (*Felis catus*) or dogs (*Canis familiaris*) were seen but they can be expected in such an area. No rodent trapping was conducted but it is expected that the black rat, Norway rat (*Rattus norvegicus*) and house mouse are present in the area.

No bat observations were made. Jacobs (1994) recorded bats at South Point and along Mamalahoa Highway, about 5 miles west of Naalehu town.

The most numerous bird species found at the site was the yellow fronted canary (*Serinus mozambicus*). A total of 26 were counted during the walk around the site. Zebra doves (*Geopelia striata*) followed in abundance, followed by the common myna (*Acridotheres tristis*). There were also northern cardinals (*Cardinalis cardinalis*), spotted doves (*Streptopelia chinensis*), house finches, yellow billed cardinals (*Paroaria capitata*), saffron finches (*Sicalis flaveola*) and Japanese white-eyes (*Zosterops japonicus*) (listed in order of abundance).

The only indigenous bird observed during the survey was the Pacific golden plover. No Hawaiian hawks were observed or expected since the site, which is open savanna, is outside the normal range of the species (Scott et al. 1986).

Day et al. (2003) monitored a site at Punaluu which is about 7.7 miles northeast of the site and found 1.6 targets per hour, the species could not be determined. It is difficult to extrapolate their results at Punaluu to the Naalehu Pasture site since topographic features are very different. Topography can be an important factor in flight routes for the Newell's shearwater, but apparently less so for dark rumped petrel (Cooper and Day 1992).

Project Name: South Point, elev. 1206 ft.

The South Point site is an existing antenna farm situated in open pastureland. The topography was flat but gently sloping makai with a swale nearby. It is within vegetation zone B of Ripperton and Hosaka (1942 in Schwartz and Schwartz 1949). The mean annual temperature is 70°F. Annual rainfall within this zone is 20-40 inches. The topography is characterized as coastal flats with adjacent sloping lands with lava common (adapted from Ripperton and Hosaka 1942 in Schwartz and Schwartz 1949).

There was mixed species of pasture grasses with kikuyu (*Pennisetum clandestinum*) dominating. Lantana (*Lantana camara*) occurred in small clumps. There was scattered apple of Sodom (*Solanum linnaeanum*). In a swale, there was Christmas berry and haole koa.

The survey was conducted on March 29, 2003 from 06:57 to 07:40 hours, in low clouds and misty conditions. Winds were about 20 mph. Domestic cattle grazed throughout the site. Although not observed the small Indian mongoose is expected to inhabit the area. No feral cats or dogs were seen but they can be expected in such an area. No rodent trapping was conducted but it is expected that the house mouse is present in the area.

Jacobs (1994) recorded the Hawaiian hoary bat at South Point and along Mamalahoa Highway, about 5 miles west of Naalehu town

The most abundant bird at the site was the yellow fronted canary which was in flocks throughout the pasture. There was also an abundance of Eurasian skylark and the migratory Pacific golden plover. The short pasture grass made excellent habitat for these birds. Yellow billed cardinals and Japanese white-eyes were found in the Christmas berry shrubs in the swale. Zebra doves were found in bare areas of the pasture. Northern cardinals were found in lantana and house finches and common mynas were also observed in the pasture.

The South Point site was outside the normal range of the Hawaiian hawk. Day et al. (2003) conducted surveys for these two seabirds at Punaluu (13 miles) and at Hoopuloa (19 miles) but no monitoring was conducted at South Point. They suggested that the targets detected at Hoopuloa were more likely Newell's shearwaters. As long as no lighting is installed to disorient the birds in inclement

weather, it is unlikely that these nocturnally active birds will collide with the replacement antenna.

Project Name: Kauna Point, elev. 100 ft.

The Kauna Point site is near sea level and is on barren aa lava flow with little or no vegetation. Adjacent areas include pahoehoe flows with fountain grass (*Pennisetum setaceum*). The site is in Ripperton and Hosaka's (1942 in Schwartz and Schwartz 1949) vegetation zone A. The mean annual temperature is 75°F at sea level. Maximum temperatures may exceed 90°F. There is less than 20 inches annual rainfall. The rains are usually from the southwest. They are torrential and infrequent. There is high run off and evaporation. Long dry periods are common. Native ohia trees were present but sparse. Near the coast kiawe (*Prosopis chilensis*) trees were present. Ground cover is introduced grasses with ilima (*Sida* sp.) and uhaloa shrubs as well as introduced sourbush (*Pluchea carolinensis*). Christmas berry was in the fountain grass.

The site was surveyed on April 23, 2003 during the middle of the day from 11:08 to 11:39 hours. It was hot with winds from the west. Only the house finch was present during the survey feeding on sourbush seeds. Feral goats (*Capra hircus*) were observed on the way to the site in the grassland. The area is a public hunting area and hunters were present and had killed a young male goat.

Kauna point is outside the normal range of the Hawaiian hawk, there being no forest at this elevation. No pueo was observed. No hoary bat observations were made. Jacobs (1994) reports bat observations more mauka along the highway through Manuka Natural Area Reserve. The hoary bat recovery plan shows one record near Kauna Point (1997). Day et al. (2003) conducted Newell's shearwater and Hawaiian dark rumped petrel studies at Hoopuloa Point, 11 miles to the north. They recorded 1.2 targets per hour during May-June 2001 and 2002 and suggest that the targets were probably Newell's shearwater.

Project Name: Ohia Mill, elev. 2,355 ft.

The Ohia Mill site was in vegetation zone C2 (Ripperton and Hosaka 1942 in Schwartz and Schwartz 1949). The annual mean temperature within this zone is 60°F. Rains originate from the north east with annual rainfall between 40-60 inches. Dry periods of more than one month are uncommon. The topography is steep with lava substrate. The forest was ohia with mixed introduced species of Christmas berry, silk oak (*Grevillia robusta*), guava (*Psidium guajava*) and cherry guava (*Psidium cattelianum*). The forest adjacent to the project site had been cleared for pasture and macadamia nuts.

The survey of Ohia Mill was conducted on March 29, 2003 between 10:25 and 10:57 hours. It was overcast and drizzling.

House finches were the most abundant bird at the site. There was also spotted doves, zebra doves, northern cardinal, saffron finch and Japanese white eyes observed on site. Only one native bird the apapane was seen in an ohia tree on the project site.

Domestic sheep and goats were being raised in the pasture. Feral pig trails and droppings were found outside the fence project site. Macadamia nuts were dumped on the ground and pig trails radiated out from the dumpsite. No rodent trapping was conducted but it is expected that all three species of *Rattus* would be present since there were forest, field and human habitation. The house mouse would also be expected.

The site is within the known distribution of the Hawaiian hoary bat but no attempt was made to survey the bat (Jacobs 1994). Jacobs found bats all along the southwestern coast of the island (1994) along Mamalahoa Highway.

No Hawaiian hawks were observed during the survey but the site is within the known range of the hawk (Scott et al. 1986). No pueo or barn owl was seen, they may be present however, especially in the open fields. Day et al. (2003) conducted radar surveys of these species at Hoopuloa, 3.2 miles to the southwest along the coast and found 1.2 targets per hour from May-June 2001 and 2002. They suggest that the targets were probably Newell's shearwater.

Project Name: Moanuahea, elev. 3,214 ft.

The Moanuahea site was in vegetation zone C2 (Ripperton and Hosaka 1942 in Schwartz and Schwartz 1949). The annual mean temperature within this zone is 60°F. Rains originate from the north east with annual rainfall between 40-60 inches. Dry periods of more than one month are uncommon. The topography is steep with good soil. Adjacent areas were used as a golf course and pasturage for domestic cattle. There was an occasional native ohia. Common trees were silk oak and guava. Kikuyu grass was the predominant ground cover.

The site was surveyed on March 29, 2003 between 12:15 and 13:07 hours. Low clouds were present. During the survey there was mist to light rain.

A number of game bird species were observed during the survey; Erkel's francolin, peafowl (*Pavo cristatus*), ring necked pheasant, spotted dove and turkey. Northern cardinals and Japanese white-eyes were also seen. No native forest birds were seen, however, the site is within known ranges of low densities of apapane and higher densities of amakihi (Scott et al.).

No rodent trapping was conducted but it is expected that the roof rat is present. The house mouse would also be expected.

The site is within the known distribution of the Hawaiian hoary bat but no attempt was made to survey the bat (Jacobs 1994). Jacobs found bats all along the western coast of the island (1994) along Mamalahoa Highway.

No Hawaiian hawks were observed during the survey but the site is within the known range of the hawk (Scott et al. 1986). No pueo or barn owl was seen, they may be present however, especially in the pasture land. Day et al. (2003) conducted radar surveys of these species at Honokohau and Kona and found zero targets per hour from May-June 2001 and 2002.

Project Name: Kulani Cone, elev. 5,508 ft.

Kulani Cone is in vegetation zone D3 (Ripperton and Hosaka 1942 in Schwartz and Schwartz 1949). Mean annual temperature is 50°F. Precipitation originates in the northeast and ranges from 50 to 100 inches of mean annual rainfall. Mist is frequent. The site is within a koa and ohia dominated mixed montane mesic forest.

The survey was conducted on April 22, 2003 between 10:13 and 10:40 hours under overcast conditions, with drizzle and winds of about 25 mph. The survey was conducted by walking down the access road from the top of the puu to its base.

The endemic apapane was the most abundant species encountered during the brief survey. Next in abundance were the native omao (*Myadestes obscurus*) and the introduced red billed leiothrix (*Leiothrix lutea*). Other introduced species encountered were the northern cardinal, kalij pheasant, Japanese white-eye and the house finch. Only one native amakihi was seen. No other native species were encountered, however, Hawaii Natural Heritage database (April 10, 2003) show records of the federally listed endangered Hawaiian hawk, o'u (*Psittirostra psittacea*), akiapolaau (*Hemignathus munroi*), Hawaii creeper (*Oreomystis mana*), and Hawaii akepa (*Loxops coccineus coccineus*) occurring near the site. The database also shows a 1941 record of the Hawaiian crow (*Corvus hawaiiensis*), but it is now considered to be absent from the area.

No pueo or barn owl (*Tyto alba*) was seen, the area is marginal for owls due to the dense forest type, but they may be present in areas cleared of forest and used as pasture. Hawaiian dark-rumped petrels have been reported on Mauna Loa within Hawaii Volcanoes National Park (Day et al. 2003). Newell's shearwaters are believed to nest at moderate elevations on the southeastern slopes of Mauna Loa (Day et al. 2003). Day et al. (2003) conducted radar surveys of these species at Holei Sea Arch (about 20 miles from the site) along

the southeast coast of the island and found 1.2 targets per hour from May-June 2001 and 2002. They suggested that Newell's shearwaters were the most likely species passing through the Holei Sea Arch site. At Punaluu (about 26 miles from the site) they found 1.6 targets per hour. They could not be certain of the identity of the targets at Punaluu and suggested that both the petrel and the shearwater were sampled at the site.

No rodent trapping was conducted but it is expected that the roof rat is present. The house mouse would also be expected. Feral pigs are known to be in the area, however the site is within a feral pig control unit and it is expected that feral pig numbers are low.

Project Name: Huehue Ranch elev. 3,304 ft.

The Huehue Ranch site is within vegetation zone B of Ripperton and Hosaka (1942 in Schwartz and Schwartz 1949). The mean annual temperature is 70°F. Annual rainfall within this zone is 20-40 inches. The topography is characterized as coastal flats with adjacent sloping lands with lava common (adapted from Ripperton and Hosaka 1942 in Schwartz and Schwartz 1949).

The ground was rocky pahoehoe lava with open savanna of scattered large ohia trees and fountain grass. Other plants included mamane, Christmas berry and silk oak.

The survey was conducted on May 5, 2003 between 11:43 and 12:13 hours. House finches, Erkel's francolin, gray francolin (*Francolinus pondicerianus*), peafowl, saffron finches, northern mockingbird (*Mimus polyglottos*), common mynas and zebra doves were encountered. No native birds were encountered. The site is within the known range of the Hawaiian hawk and the pueo (Scott et al. 1986). Day et al. (2003) reported 0 targets at the nearest sampling points of Honokohau and Kona during their Newell's shearwater and Hawaiian dark-rumped petrel coastal surveys.

No bat observations were made but the site is within the known range of the Hawaiian hoary bat (Jacobs 1994). Old feral goat dropping were present, but no animals were seen. No rodent trapping was conducted but the house mouse is expected.

Newell's Shearwaters and Hawaiian Dark Rumped Petrels.

The U.S. Fish and Wildlife Service has expressed concern over the potential take of Newell's shearwaters and Hawaiian dark-rumped petrel as a result of replacing or refurbishing antennas at Kulani Cone, Kamehameha Park, Iolehaehae and Kauna Point. They have calculated the expected take of birds by these towers

during the 20 year life of the towers (VanderWerf 2003). These calculations were based on incomplete information on the movement patterns of these two species within the vicinity of these sites.

The Newell's shearwater is a federally listed threatened species and the Hawaiian dark-rumped petrel is a federally listed endangered species.

Berger (1972) reported that on Maui a few dark-rumped petrels returned to their breeding grounds on Haleakala as early as March. They occupied burrows but left and did not return for one to two months. The egg laying period for the entire colony was thought to be a short period in mid-May. Incubation is between 50-55 days. All young left burrows from mid-October to the first week of November (Berger 1972).

On Kauai, the first Newell's shearwaters arrive in April but the bulk of the population returns in May (Berger 1972). The Newell's shearwater nests high in the mountains in burrows excavated under thick vegetation, especially uluhe (*Dicranopteris linearis*). It has been reported in the Kohala Mountains and Waipio Valley in relatively large numbers (David 2002). Egg laying probably takes place at the beginning of June. Most hatching occurs between mid-July and the first week in August. Most adults leave nesting colonies by the beginning of October. The chicks fledge in October and early November. It is during this time that the Newell's shearwaters are noted for their "fall out" or "raining down" on highways, parks, football fields and buildings. The birds are attracted to lights and become disoriented (Berger 1972).

Because dark-rumped petrels on Kauai exhibited less of a problem with fallout than did Newell's shearwaters (*Puffinus newelli*), Cooper and Day (1992) speculated that dark-rumped petrels flew higher and were less attracted to lights than the Newell's shearwaters.

Cooper and Day (1992) studied the fall out phenomenon in October 1992 on Kauai using ornithological radar. Unfortunately the species cannot be differentiated by the radar. Species identity is presumed based on whether the targets fly in early (dark rumped petrels) or later (Newell's shearwaters) in the evening. Cooper and Day (1992) found substantial geographic variation in movement rates of these birds on Kauai. The highest rates of movement and fall out were along river valleys and over brightly lit areas and involved mainly juvenile birds. Some areas besides valleys or brightly lit places also may have substantial movements. They suspected that while natural depressions and lights may focus bird movements, in many cases the birds fly directly to colonies, regardless of these features. They indicated that it was unclear how consistently birds fly through specific areas while going to and from colonies.

Most of the targets recorded on vertical radar by Cooper and Day (1992) occurred between 249 ft (76 m) and 902 ft (275 m) agl. Of the 378 targets

recorded by vertical radar only one occurred below 249 ft (76 m) and that was at 226 ft (69 m). The visual estimates of altitudes of 222 shearwater or petrel targets at coastal sites, using night vision scopes and binoculars ranged from 98 ft (30 m) to 984 ft (300 m) Cooper and Day (1992).

Cooper and Day (1998) studied summer behavior and mortality of dark-rumped petrels and Newell's shearwaters at power lines on Kauai between June 1-25, 1993 and May 28 to June 3, 1994. They found that both species flew closer to the coastal powerlines in the morning (00:00 to 05:59 hrs) than in the evening (19:00 to 23:59 hrs). There was no mortality of dark rumped petrels during the survey and the Newell's shearwaters found on the ground or dead were brought down in the morning at powerlines less than 325 ft (100 m) from the coast and in valleys. The birds tend to fly at higher altitudes over land and then drop down as they near the coast where over the sea they may fly only 3-6 ft (1-2m) over the water.

With the exception of Kauna Point most of the sites sampled would not be considered coastal. The Kauna Point site is 2,100 ft (646 m) from the coastline. The studies indicate that both species of birds would be expected to transit at altitudes well above the heights of the antennas proposed in this project with the exception of Kulani Cone which will be 250 ft (76 m). The antenna at Kamehemeha Park in Hawi, which was not part of the wildlife survey, will be only 140 ft (42.7 m).

Site	Install Tower Height
Iolehaehae	50 ft (15.2 m)
Naalehu Pasture	100 ft (30.5 m)
South Point	80 ft (24.4 m)
Kauna Point	160 ft (48.8 m)
Ohia Mill	150 ft (45.7 m)
Moanuaieha	80 ft (24.4 m)
Kulani Cone	250 ft (76.2)
Huehue	100 ft (30.5 m)

Because Kulani Cone is within the expected height of transiting birds, and petrels are known to occur on Mauna Loa, further radar surveys as recommended by the U.S. Fish and Wildlife Service may be warranted. Kamehameha Park was not included in this wildlife survey. It is typically well lighted and is in an area where the highest concentration of targets were detected by Day et al (2003) albeit in Waipio Valley. Iolehaehae, while the antenna is low, is at an elevation of 8,121 ft on northeastern slopes of Mauna Kea where colonies have been suspected. If nesting occurs nearby, the birds would no longer transit at the 250 ft (76 m) altitude but would be closer to the ground. It is reasonable then to further study

this site during an optimal period such as June or July. Kauna Point is near sea level but is 646 m (2,100 ft) from the coastline. Its tower is only 160 ft high. The birds would be expected to be flying higher than the tower at this site. The nearest sampling site of Day et al (2003) was 11 miles with only 1.2 targets per hour. It is probably unnecessary to further study this site for shearwater or petrel mortality risk assessments.

CONCLUSIONS AND RECOMMENDATIONS

The project involves either refurbishing or replacing existing antennas at sites where there are other existing antennas. Many of the sites fall within the normal range of Hawaiian hawks. The hawks will not be impacted by the project since they fly during the day and have very good eyesight and will be able to see the antenna structures. The Pueo will also be able to see the antenna whether flying in the day or night. Forest birds because they are not active at night will not be impacted by the project since they will be able to see the structures and because no forest habitat alterations are planned.

The emergency telecommunications antennas will not have guy wires or powerlines. Since both Newell's shearwaters and the dark-rumped petrels fly at night, it is reasonable to assume that they would be able to see the structures and avoid them. The birds apparently have fairly good night vision, and they keep a safe distance from structures unless disoriented by bright lights (USCG 2000). Studies conducted on Kauai by Cooper and Day 1992, indicate that "fallout" occurs when birds are disoriented by bright lights. The projects will not have lights to disorient birds at night. In addition, data from Kauai (Cooper and Day 1992, Cooper and Day 1998) seem to indicate that transiting birds will fly at altitudes well above the proposed antenna heights, with the exception of Kulani Cone, which will be 70 ft higher than the existing highest tower. Further studies at Kulani Cone are needed to ascertain whether there are real risks to these threatened and endangered birds from the proposed project. A radar survey for Kulani Cone is recommended.

The Hawaiian hoary bat is widespread on the island of Hawaii, however it is unlikely that bats would be negatively impacted by the proposed project since bats use echolocation to navigate and forage on flying insects, and therefore it is highly unlikely that they would collide with one of the existing or replacement antenna structures.

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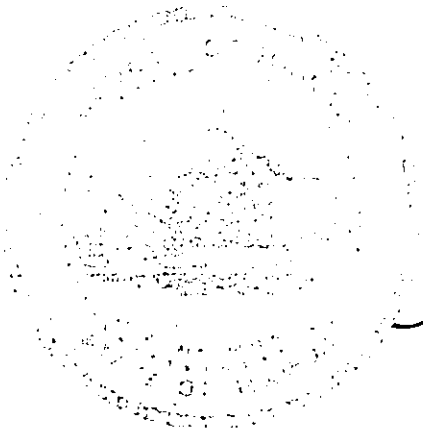
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Appendix B-1 Iolehāehae Auditory
Survey



Auditory Surveys for Montane Seabirds at Iolehaehae on Mauna Kea

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Hawai'i National Park, HI 96718

Abstract: A one-evening auditory survey was conducted at Iolehaehae on the northeastern slope of Mauna Kea to investigate whether montane seabirds occur at that location. The purpose of the survey was to discover whether an antenna that was being upgraded by the County of Hawai'i would be likely to affect seabirds commuting past or utilizing that area. The three species targeted included the endangered Hawaiian Petrel (*Pterodroma sandwichensis*), the threatened Newell's Shearwater (*Puffinus auricularis newelli*), and the rare Band-rumped Storm-Petrel (*Oceanodroma castro*). During the 160 minutes of auditory survey and 50 minutes of concurrent night-vision survey, no montane seabirds were seen or heard.

Introduction: The occurrence of Hawaiian Petrels on Mauna Kea was documented historically (Richardson and Woodside 1954) but has not been confirmed in recent years. The presence of montane seabirds on Mauna Kea was last investigated by Winston Banko, who could not confirm their presence in 1970, but heard the "rush of wings" near Pu'u Kanakaleonui (Banko 1980), approximately 4 kilometers from Iolehaehae. Earlier records identified remains of Hawaiian Petrels at the Pu'u Kanakaleonui (Richardson and Woodside 1954). Recent radar surveys on Hawai'i Island suggest that Newell's Shearwaters and Hawaiian Petrels may still occur on Mauna Kea (Day *et al.* 2003). Band-rumped Storm-Petrels have not been documented on Mauna Kea, but they probably nest at similar elevations as Hawaiian Petrels and Newell's Shearwaters (Slotterback 2002) and so were included in the surveys.

An evening survey was scheduled in order to intercept seabirds returning to upland breeding colonies. Radar and visual surveys have found that Hawaiian Petrels fly inland mainly from just after sunset to the point of complete darkness, whereas the highest rates of movement inland of Newell's Shearwaters occur 1-2 hours after sunset (Day *et al.* 2003, Cooper *et al.* 2003). On Kaua'i Island, inland movement rates for both species peaked during the approximately two hours around sunset (Day and Cooper 1995). Band-rumped Storm-Petrels return to breeding colonies from one to three hours after dark (Wood *et al.* 2001). The Iolehaehae auditory surveys was timed to coincide with this evening influx of birds.

Flying montane seabirds should be detectable to observers by vocalization and by the noise made by their flight as they pass overhead. The flight of commuting seabirds may be heard if they pass low over observers (Personal Observation). Vocalization of some species may be heard as they fly inland. Hawaiian Petrels fly silently to their nests but vocalize during pre-breeding flight displays near breeding colonies (Simons and Hodges 1998). Newell's Shearwaters rarely call as they fly to their colonies but may be heard calling on the ground or in flight over the breeding colony (Ainley *et al.* 1997). Band-rumped Storm-Petrels vocalize when flying to their nests (Wood *et al.* 2001). Band-rumped Storm-Petrels also have a display-type call used during aerial chases (Harris 1969).

Study Area

Iolehaehae is a cinder cone located on the northeastern slope of Mauna Kea, Hawai'i Island. An array of antennas is situated at Iolehaehae and includes an aging microwave antenna owned by the County of Hawai'i. The noise created by a diesel generator that provides power to one antenna created some difficulty in selecting a survey site; to minimize the noise of that generator,

the survey was located on the northeastern slope of the cinder cone below two antenna towers, on the opposite side of the cinder cone from the generator. This location provided a seaward view of a wide expanse of land.

Materials and Methods

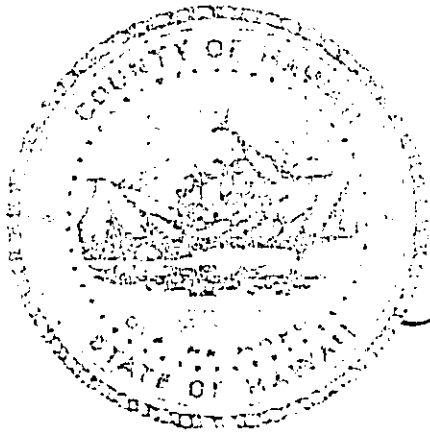
Auditory surveys were conducted by one individual between 1900 and 2130 hours on 11 July 2003. In addition, third-generation night-vision goggles (1×) were used to scan the landscape for flying birds from 1930 to 2025 hours. At 2030 hours, night-vision surveys were abandoned for the rest of the evening due to poor visibility from fog and rain. A five-minute break was taken to record weather at the beginning and end of the survey and every 25 minutes during the survey.

Results and Discussion

No montane seabirds were seen or heard during the 180 minutes of surveys. If montane seabirds still use the upper slopes of Mauna Kea for nesting and reproduction, they are probably widely dispersed and difficult to detect. Although it would be difficult to assess whether or not commuting montane seabirds pass within range of the Iolehaehae antenna array in one night of surveys, displaying birds should have been heard if a display area occurred within a few hundred meters of the survey point. The survey was planned for the approximate peak of Hawaiian Petrel colony attendance at a time where breeding birds are attending their burrows most often and when pre-breeding Hawaiian Petrels are still visiting display areas (Simons and Hodges 1998). Therefore, if a montane seabird breeding or display area existed near Iolehaehae, it is likely that vocalizations would have been detected.

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Appendix B-2

Kamehameha Park,
Kauna Point
(Manuka Wayside),
Kulani Cone Radar Surveys
Data Summary



20 August 2003

PBR HAWAII
Attn: Yukie Ohashi
Hilo, HI

Dear Yukie:

We are happy to report that, in spite of all of the bad weather we encountered over there this year, we still got enough data to evaluate bird movements at the three sites that we were hired to examine: Kapa'au (Kamehameha Park), Manuka Wayside (as a proxy for Kauna Point, which lies directly downslope of it but is extremely difficult to access), and Kulani Cone near Volcano. We collected data on 3 of 3 nights at the Kapa'au site, on 3 of 3 nights at the Manuka site, and on 3 of 5 nights at the Kulani Cone site. Hence, we were able to meet our first study objective of at least 2 nights of "good" data at each site.

At Kapa'au, we recorded a total of 7 targets on radar over the 3 nights; direction-wise, they appeared to be heading toward/coming from the Pololu Valley. We also saw one Newell's Shearwater on the night-vision scope flying at 75 m agl. This site had the most birds but probably has a fairly low probability of collision because of the layout of the park—years ago, somebody had the foresight to plant two rows of Cook Pines at nearly right angles near the existing tower (where the replacement will go), perhaps to shield this tower from view. These trees are so tall that the existing 100-ft tower extends above them only ~2 m. Hence, they form a good visual barrier to birds flying through this area and shield nearly the entire height of the tower.

At Manuka Wayside, we recorded a total of 1 target on radar over the 3 nights; direction-wise, it was heading downslope toward the ocean, apparently from a nesting area farther upslope. We saw no birds on the night-vision scope. This site has pretty extensive forest around where we sampled, but it apparently thins out down near the ocean, from what I can see on the photos that you had sent me earlier.

At Kulani Cone, we were surprised to record 0 targets on radar over the 3 nights on which we were able to collect data; this was a really good sampling site, too. Thus, although this site was the most worrisome to us in many ways (we suspected that it might have the most birds), it appears to have no (or essentially no) birds flying over it—a petrel or shearwater *very* rarely passes this way.

Thus, we believe that the news here is good overall, especially since the one site with the most birds has the best shielding for the tower.

I (Bob) will try to keep you apprised of any other insights we develop about this project. Please contact me if you have any questions.

Sincerely yours,

Robert H. Day, Ph.D.
Senior Scientist

Brian A. Cooper
Senior Scientist

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Appendix B-3

USFWS Interim
Guidelines for
Recommendations on
Communications
Tower Siting

**U.S. Fish and Wildlife Service Interim Guidelines For Recommendations On
Communications Tower Siting, Construction, Operation, and Decommissioning**

1. Any company/applicant/licensee proposing to construct a new communications tower should be strongly encouraged to collocate the communications equipment on an existing communication tower or other structure (e.g., billboard, water tower, or building mount). Depending on tower load factors, from 6 to 10 providers may collocate on an existing tower.
2. If collocation is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level (AGL), using construction techniques which do not require guy wires (e.g., use a lattice structure, monopole, etc.). Such towers should be unlighted if Federal Aviation Administration regulations permit.
3. If constructing multiple towers, providers should consider the cumulative impacts of all of those towers to migratory birds and threatened and endangered species as well as the impacts of each individual tower.
4. If at all possible, new towers should be sited within existing "antenna farms" (clusters of towers). Towers should not be sited in or near wetlands, other known bird concentration areas (e.g., state or Federal refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidence of fog, mist, and low ceilings.
5. If taller (>199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.
6. Tower designs using guy wires for support that are proposed to be located in known raptor or waterbird concentration areas or daily movement routes, or in major diurnal migratory bird movement routes or stopover sites, should have daytime visual markers on the wires to prevent collisions by these diurnally moving species. (For guidance on markers, see Avian Power Line Interaction Committee (APLIC). 1994. *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*. Edison Electric Institute, Washington, D.C., 78 pp, and Avian Power Line Interaction Committee (APLIC). 1996. *Suggested Practices for Raptor Protection on Power Lines*. Edison Electric Institute/Raptor Research Foundation, Washington, D.C., 128 pp. Copies can be obtained via the Internet at <http://www.eei.org/resources/pubcat/enviro/>, or by calling 1-800/334-5453).

7. Towers and appendant facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint". However, a larger tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above ground obstacles to birds in flight.

8. If significant numbers of breeding, feeding, or roosting birds are known to habitually use the proposed tower construction area, relocation to an alternate site should be recommended. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.

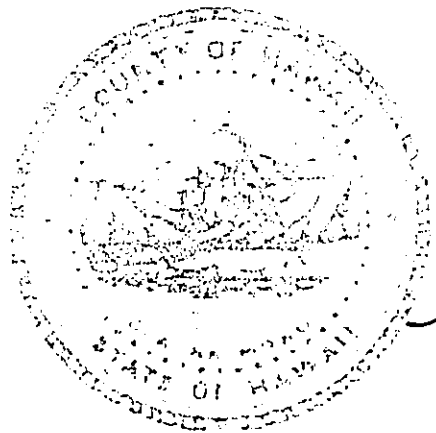
9. In order to reduce the number of towers needed in the future, providers should be encouraged to design new towers structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users (minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.

10. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.

11. If a tower is constructed or proposed for construction, Service personnel or researchers from the Communication Tower Working Group should be allowed access to the site to evaluate bird use, conduct dead-bird searches, to place net catchments below the towers but above the ground, and to place radar, Global Positioning System, infrared, thermal imagery, and acoustical monitoring equipment as necessary to assess and verify bird movements and to gain information on the impacts of various tower sizes, configurations, and lighting systems.

12. Towers no longer in use or determined to be obsolete should be removed within 12 months of cessation of use.

Version: September 14, 2000



Appendix C

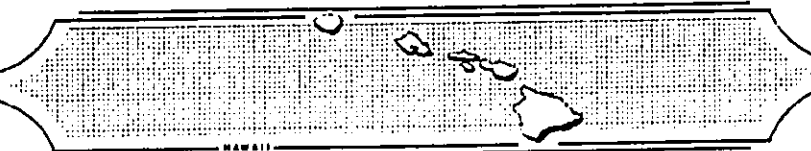
Archaeological and Cultural
Impact Assessment

**A CULTURAL IMPACT AND ARCHAEOLOGICAL ASSESSMENT
COUNTY OF HAWAII MICROWAVE UPGRADE PROJECT
for
SCIENTEL AMERICA, INC.**

Submitted to:
PBR Hawaii
101 Aupuni St., Suite 310
Hilo Hawai'i 96720

Prepared by:
Ms. Leann McGerty, B.A.
and
Robert L. Spear, Ph.D.
Scientific Consultant Services, Inc.
May 2003

SCIENTIFIC CONSULTANT SERVICES Inc.



711 Kapiolani Blvd. Suite 1475 Honolulu, Hawai'i 96813

INTRODUCTION

Scientific Consultant Services, Inc. (SCS) is under contract to PBR, Inc. to provide a Cultural Impact and Archaeological Assessment for the Scientel America, Inc. facilities located in the County of Hawai'i, State of Hawai'i (Figure 1). The tower locations are depicted on USGS 7.5 minute topographic quadrangle maps included with each TMK map and a review of each facility (Appendix A).

An assessment was conducted to identify historic properties (prehistoric sites, buildings, structures, objects, or districts) listed in, or eligible for listing in, the regulations implementing Section 106 of the National Historic Preservation, Act of 1966, as amended.

The County of Hawai'i has an existing tower facility and equipment shelter at these addresses. The County of Hawai'i is in the process of upgrading its emergency radio telecommunications facilities throughout the island. Their existing system was installed in the 1970s for a vital police and fire communication function and is now out-dated and in need of replacement.

The existing 2 GHz analog microwave system will be upgraded to a new 6 GHz digital microwave system and will be in compliance with the Federal Communication Commission (FCC) recent rule change requirements. Existing towers will remain in place until new towers are up and in operation, then old towers will be removed. The new towers will be in close proximity to the existing facility. The Area of Potential Effects (APE) is considered the area where the new tower will be built. The visual APE is considered the area within which the facility is visible from any historic property.

METHODS

A records search was conducted at the State Historic Preservation Division, located in Kapolei, O'ahu; it included a review of all recorded historic and prehistoric archaeological sites within a one-half mile radius in the TMK of the project areas, as well as a review of known cultural resource survey and excavation reports. In addition, we examined the National Register of Historic Places, Hawai'i Register of Historic Places, and Inventory of Historic Places. The Historic Properties Directory was inspected for the addresses of each TMK. In addition, an archaeological site inspection was conducted for 'Iolehaehae, Na'alehu Pasture, South Point, Kauna Point, 'Ōhi'a Mill, Kailua Police Station, Moanuaheha, and Kulani Cone between April 18-24 2003.

RESULTS

The results of the records search (Appendix B) indicate that there are no archaeological sites recorded within one-half mile in the TMK of seven of the eight facilities. There are no properties listed on the National Register of Historic places and one property listed on the Hawai'i Register of Historic Places within one-half mile of TMK:9-1-001:003 in Manukā. No reports were identified pertaining to the archaeological sites at any of the eight project areas.

IMPACT ANALYSIS

SCS has visited the eight project areas. In addition, the records search did not list any historic resources adjacent to seven of the tower Facility. Because the area around the existing facilities has been cleared, machine graded, and otherwise disturbed during the original tower construction, there is no potential impact to any unrecorded archaeological sites. In accordance with 36 CFR Part 800, SCS has assessed the effects of the new County facility on any historic properties. The results of our assessment indicate that no historic properties are affected by the presence of new facilities at 'Iolehaehae, South Point, 'Ōhi'a Mill, Kailua Police Station, Moanuahea, and Kulani Cone. SCS has determined there will be "no adverse effect" on historic properties provided certain conditions (see Appendix A) are imposed and followed as mitigative actions for the Na'alehu Pasture site. A "no adverse effect" also applies to the Kauna Point tower site which is within ½ mile of an historic site, but is to undergo a minor duplication. Pursuant to Act 50, SCS has determined that no traditional or customary activities will be obstructed due to the upgrading of any of the microwave facilities.

APPENDIX A
Individual Project Area Analysis

1. 'Iolehaehae
2. Na'alehu Pasture
3. South Point
4. Kauna Point
5. 'Ōhi'a Mill
6. Kailua Police Station
7. Moanuaiea
8. Kulani Cone

Dr. H. McEldowney
601 Kamokila Blvd., Rm. 555
Kapolei, Hawai'i 96707

April 28, 2003

Subject: Review of the County of Hawai'i Facility at 'Iolehaehae (Figures 1 through 4)

Dear Dr. McEldowney:

Scientific Consultant Services, Inc. (SCS) is under contract to PBR, Hawai'i to evaluate and make recommendations to the State of Hawai'i Historic Preservation Department (SHPD) regarding digital upgrading of the County of Hawai'i's radio communication facilities. The basis for this consultation is 36 CFR Part 800.

PROJECT NAME: 'Iolehaehae **ADDRESS:** Keanakolu Quad. TMK:4-2-008:021

PROJECT DESCRIPTION: A new tri-legged self-supporting tower and a shelter approximately 10 by 12 feet will be located immediately north of the present tower. A magnitude difference of 10 feet is expected.

EXISTING CONDITIONS: Presently, a 40-foot tower is located on the site. The area of new construction has been previously machine graded to bedrock.

WORK COMPLETED: Records search and site visit.

RESULTS:

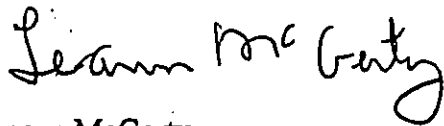
Records Search (1/2 mile radius in TMK): No archaeological or historic properties.

Field Survey: April 21, 2003

EFFECTS RECOMMENDATION: No effect.

Based on §800.4 (d), Scientific Consultant Services, Inc. requests that SHPD concur to our determination that no historic properties will be affected by this undertaking, as documented in this transmittal. In addition, pursuant to Act 50, SCS has determined there is no effect on access for hunting at adjacent Kaohe Game Management area. If you have any questions or comments regarding the letter, please contact me by phone at (808) 597-1182 or by e-mail at scs@scshawaii.com.

Sincerely,



Leann McGerty
SCS Senior Archaeologist

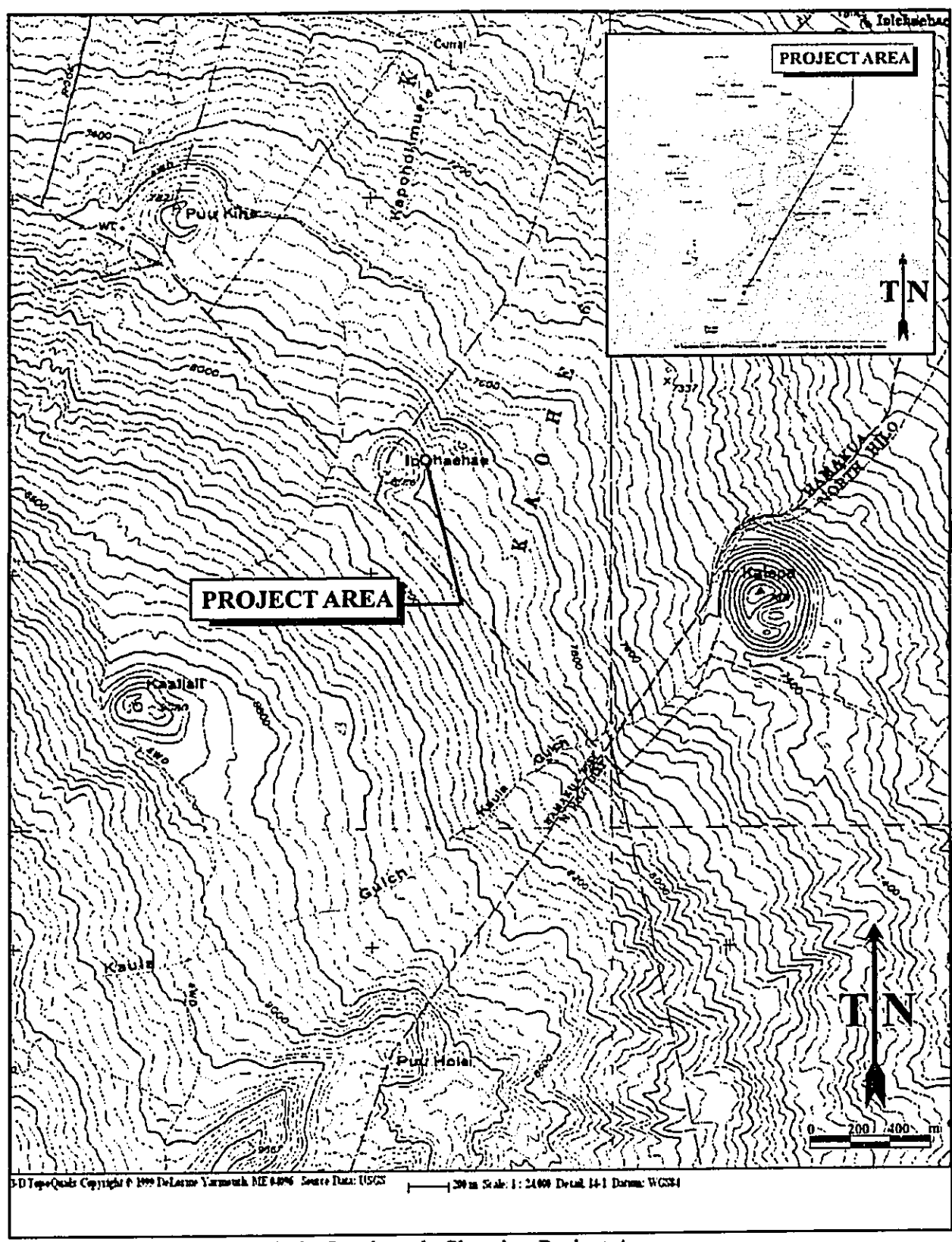


Figure 1: USGS Keanakolu Quadrangle Showing Project Area.

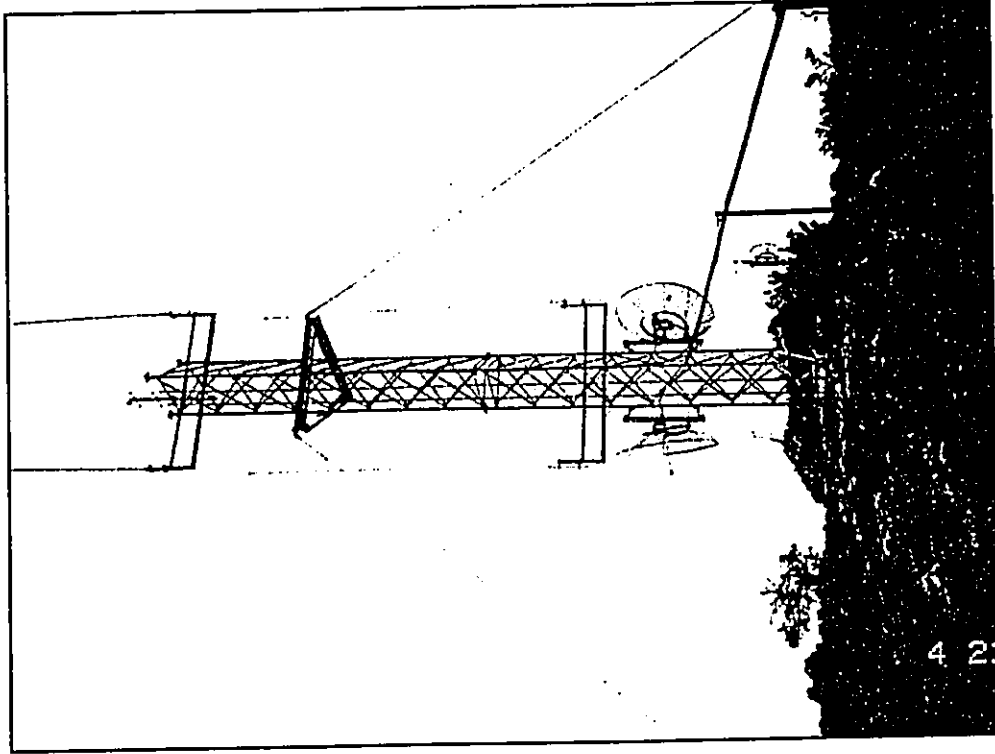


Figure 3: Present Iolehaehae Tower. View to Southeast.

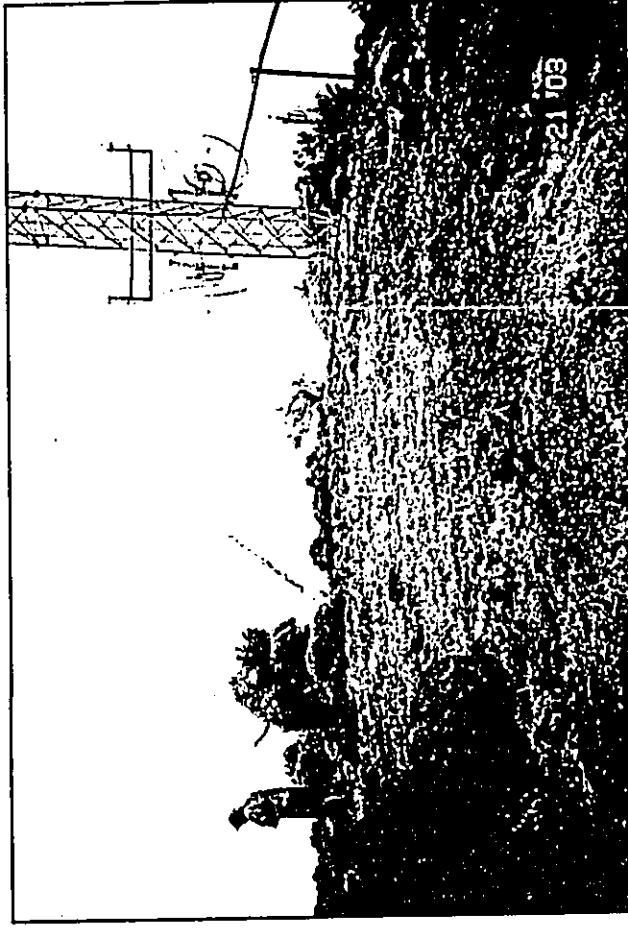


Figure 4: Disturbed Area of New Tower Placement. View to East.

Dr. H. McEldowney
601 Kamokila Blvd., Rm. 555
Kapolei, Hawai'i 96707

April 28, 2003

Subject: Review of the County of Hawai'i Facility at Na'alehu Pasture (Figures 1 through 4)

Dear Dr. McEldowney:

Scientific Consultant Services, Inc. (SCS) is under contract to PBR, Hawai'i to evaluate and make recommendations to the State of Hawai'i Historic Preservation Department (SHPD) regarding digital upgrading of the County of Hawai'i's radio communication facilities. The basis for this consultation is 36 CFR Part 800.

PROJECT NAME: Na'alehu Pasture **ADDRESS:** Na'alehu Quad. TMK:9-5-007:016

PROJECT DESCRIPTION: A new tri-legged self-supporting tower will be located immediately east of the present shelter. A magnitude difference of 50 feet is expected.

EXISTING CONDITIONS: Presently, a 50-foot tower is located on the site. The area of new construction is the previously constructed dirt road leading up to several towers.

WORK COMPLETED: Records search and site visit.

RESULTS:

Records Search (1/2 mile radius in TMK): No archaeological or historic properties.

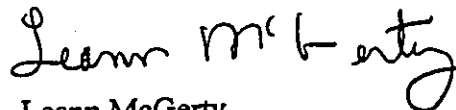
Field Survey: April 23, 2003

EFFECTS RECOMMENDATION: No adverse effect.

Based on §800.4 (d), Scientific Consultant Services, Inc. requests that SHPD concur to our determination that no historic properties will be affected by this undertaking, provided the following conditions are imposed and followed as mitigative actions:

Construction activities and vehicle parking does not impact area below *pu'u* where numerous uninvestigated rock mounds are located. If you have any questions or comments regarding the letter, please contact me by phone at (808) 597-1182 or by e-mail at scs@scshawaii.com.

Sincerely,



Leann McGerty
SCS Senior Archaeologist

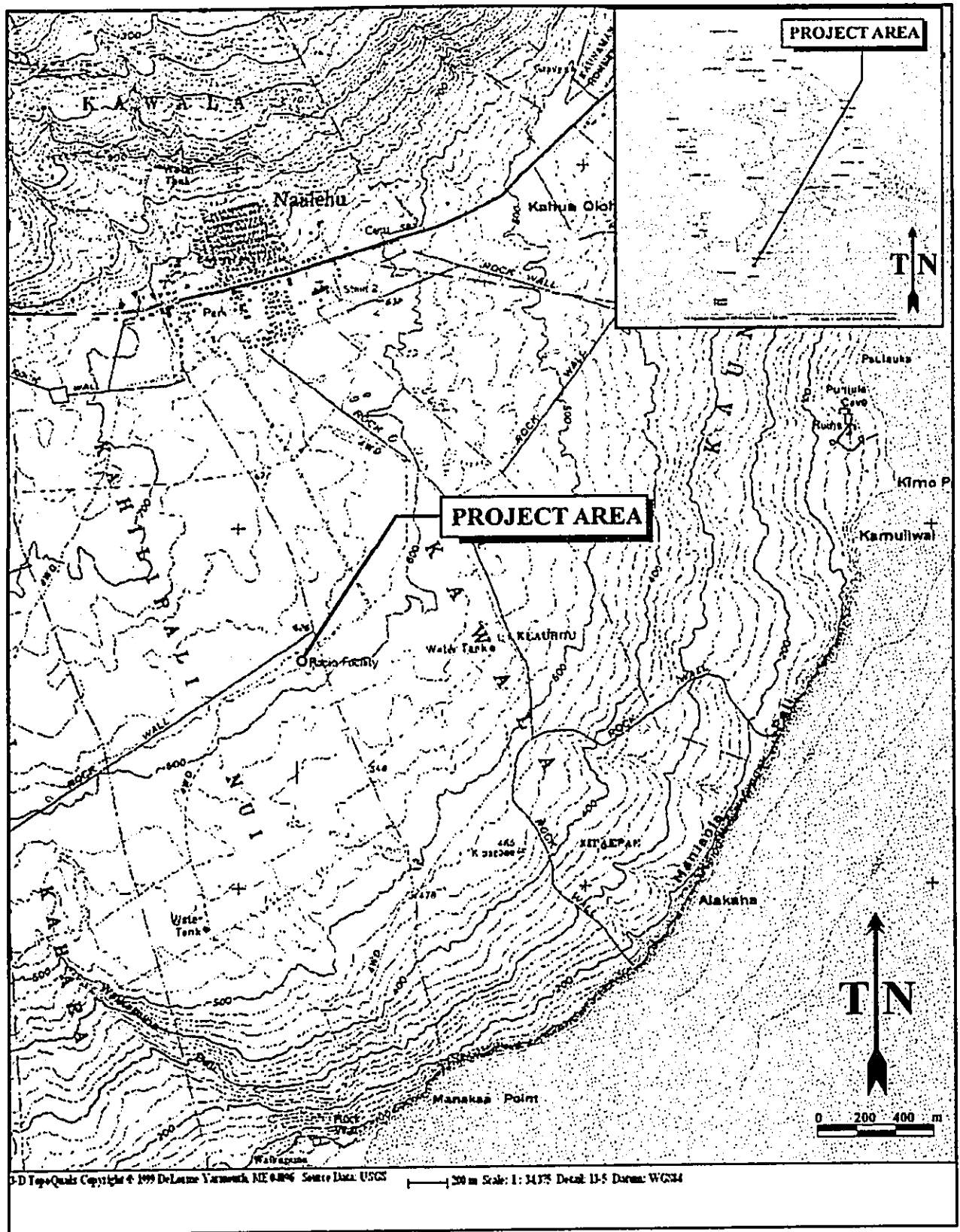


Figure 1: USGS Na'alehu Quadrangle Showing Project Area.

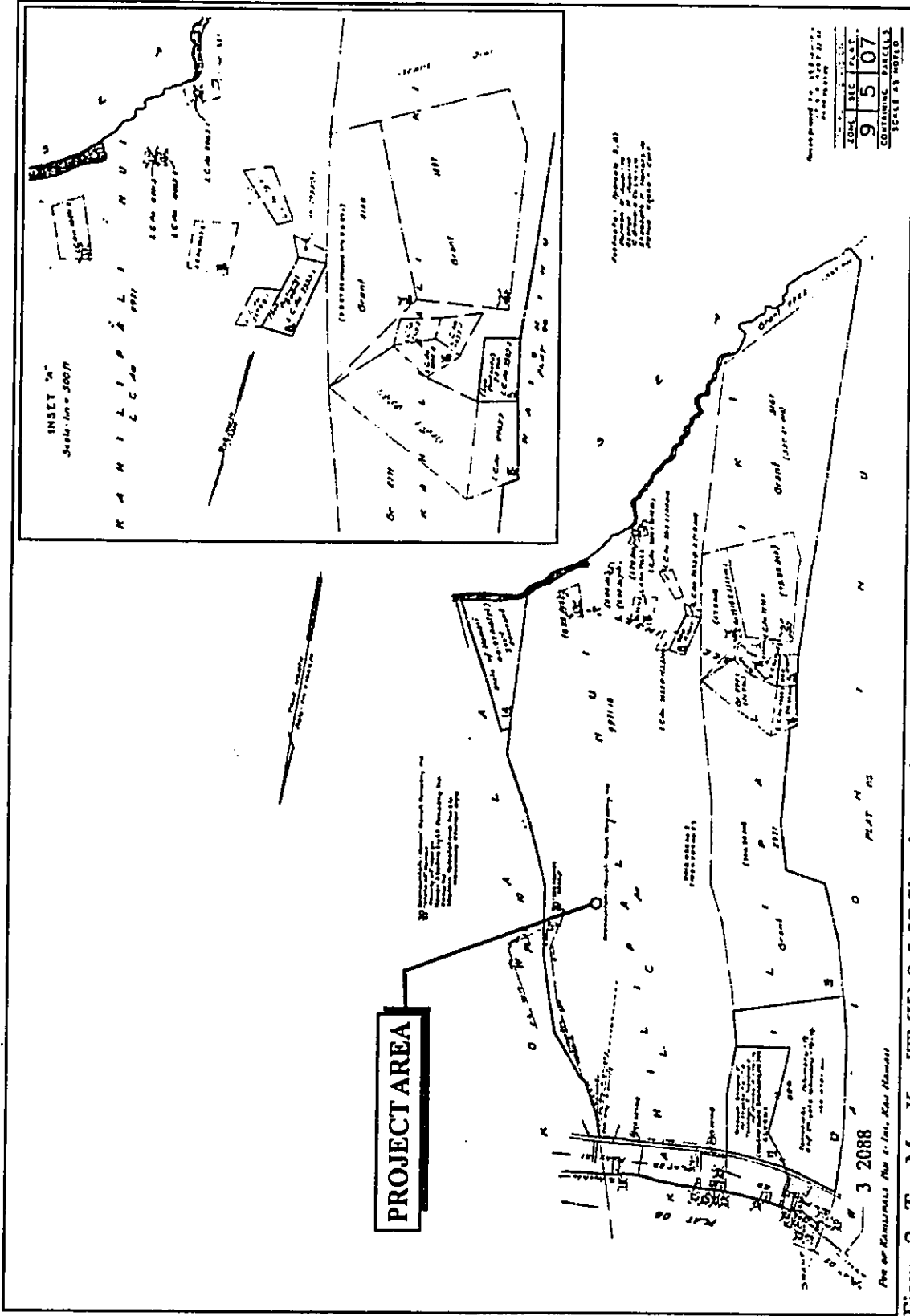


Figure 2: Tax Map Key [TMK] 9-5-07 Showing Project Area.

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

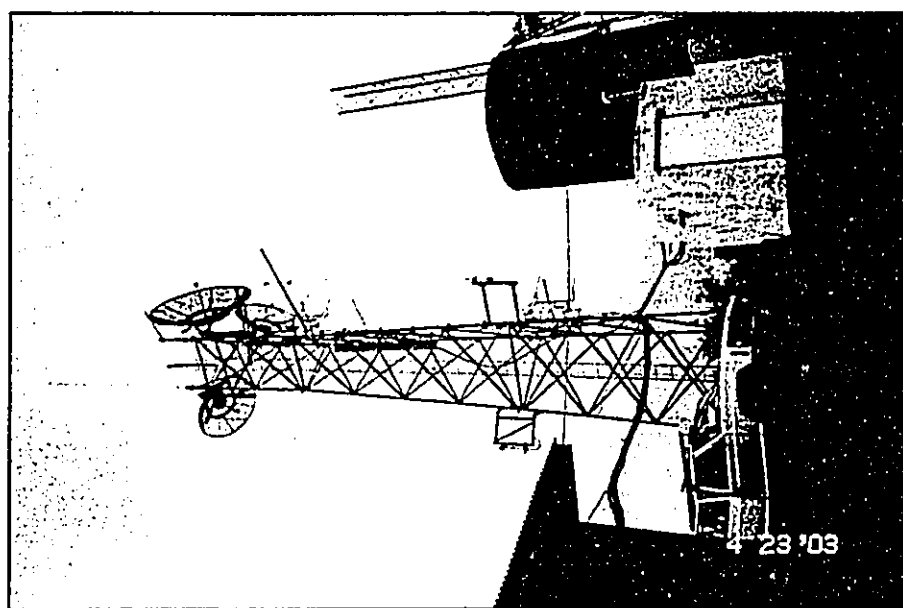


Figure 3: Present Na'alehu Tower. View to NE.

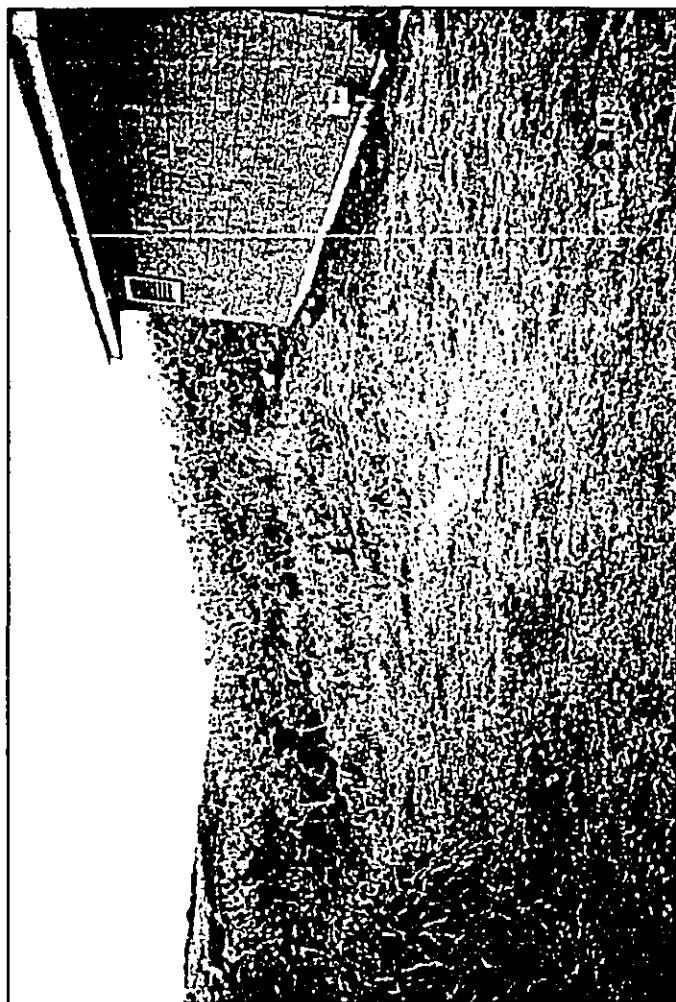


Figure 4: Graded Area of New Tower Location. View to South.

Dr. H. McEldowney
601 Kamokila Blvd., Rm. 555
Kapolei, Hawai'i 96707

April 28, 2003

Subject: Review of the County of Hawai'i Facility at South Point (Figures 1 through 4)

Dear Dr. McEldowney:

Scientific Consultant Services, Inc. (SCS) is under contract to PBR, Hawai'i to evaluate and make recommendations to the State of Hawai'i Historic Preservation Department (SHPD) regarding digital upgrading of the County of Hawai'i's radio communication facilities. The basis for this consultation is 36 CFR Part 800.

PROJECT NAME: South Point

ADDRESS: Kahuku Quad. TMK:9-3-001:006

PROJECT DESCRIPTION: A new tri-legged self-supporting tower and a shelter will be located immediately northwest of the present tower enclosure. No magnitude difference is expected.

EXISTING CONDITIONS: Presently, an 80-foot tower is located on the site. The area of new construction is in adjacent cleared pasture-land.

WORK COMPLETED: Records search and site visit.

RESULTS:

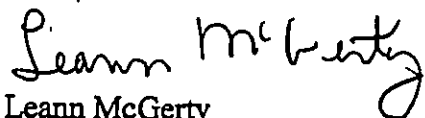
Records Search (½ mile radius in TMK): No archaeological or historic properties.

Field Survey: April 23, 2003

EFFECTS RECOMMENDATION: No effect.

Based on §800.4 (d), Scientific Consultant Services, Inc. requests that SHPD concur to our determination that no historic properties will be affected by this undertaking, as documented in this transmittal. If you have any questions or comments regarding the letter, please contact me by phone at (808) 597-1182 or by e-mail at scs@scshawaii.com.

Sincerely,



Leann McGerty
SCS Senior Archaeologist

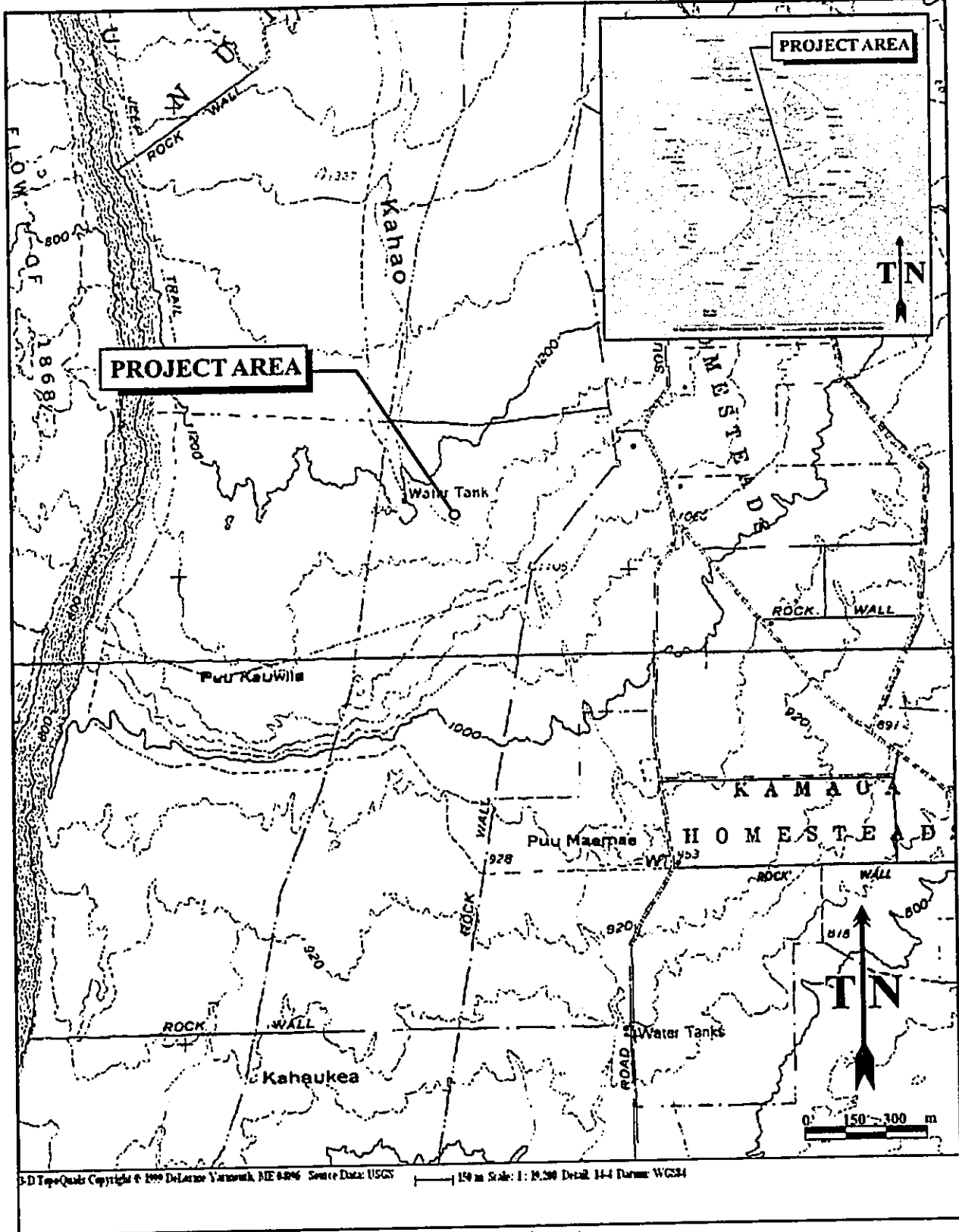


Figure 1: USGS Kahuku Quadrangle Showing Project Area.

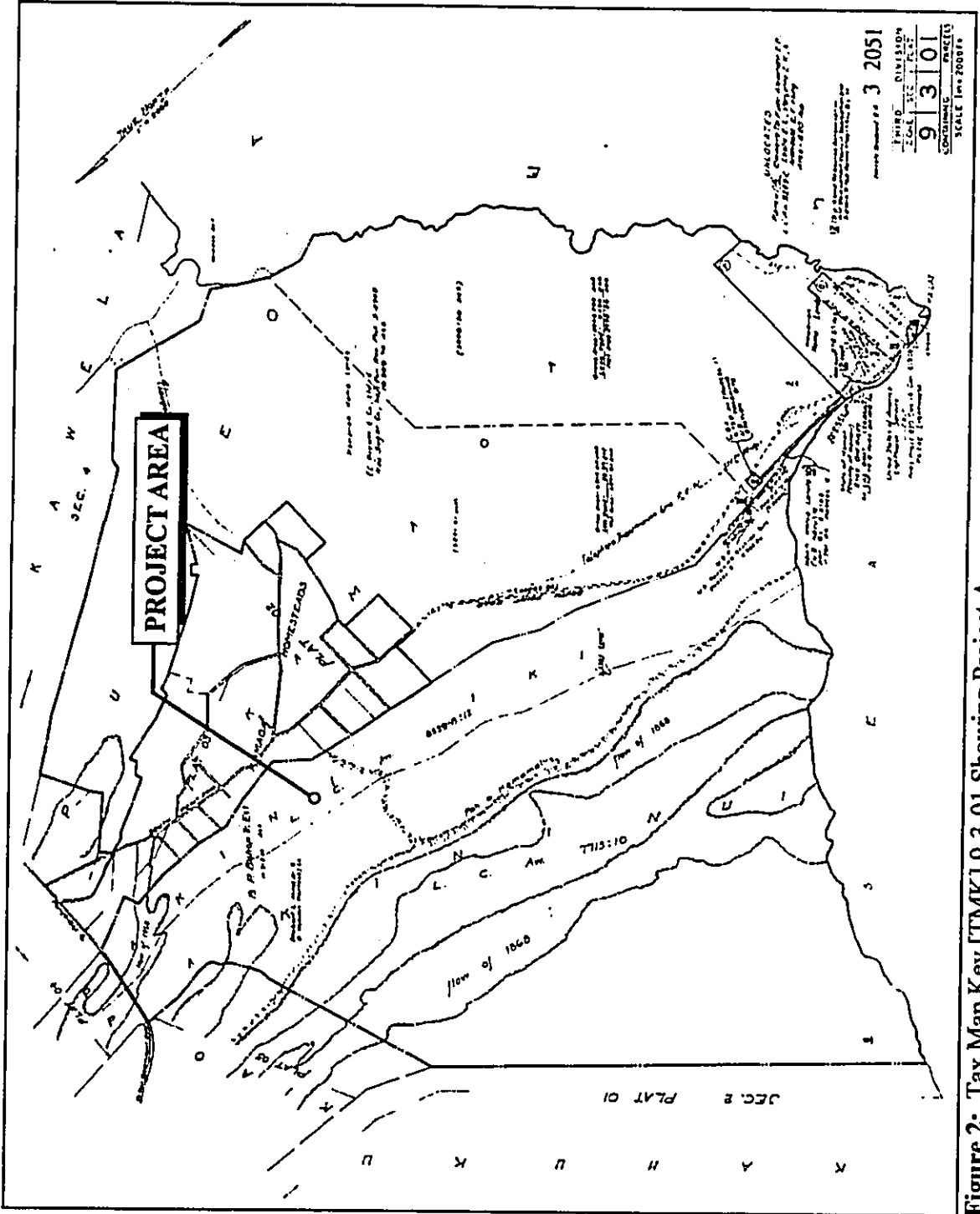


Figure 2: Tax Map Key [TMK] 9-3-01 Showing Project Area.

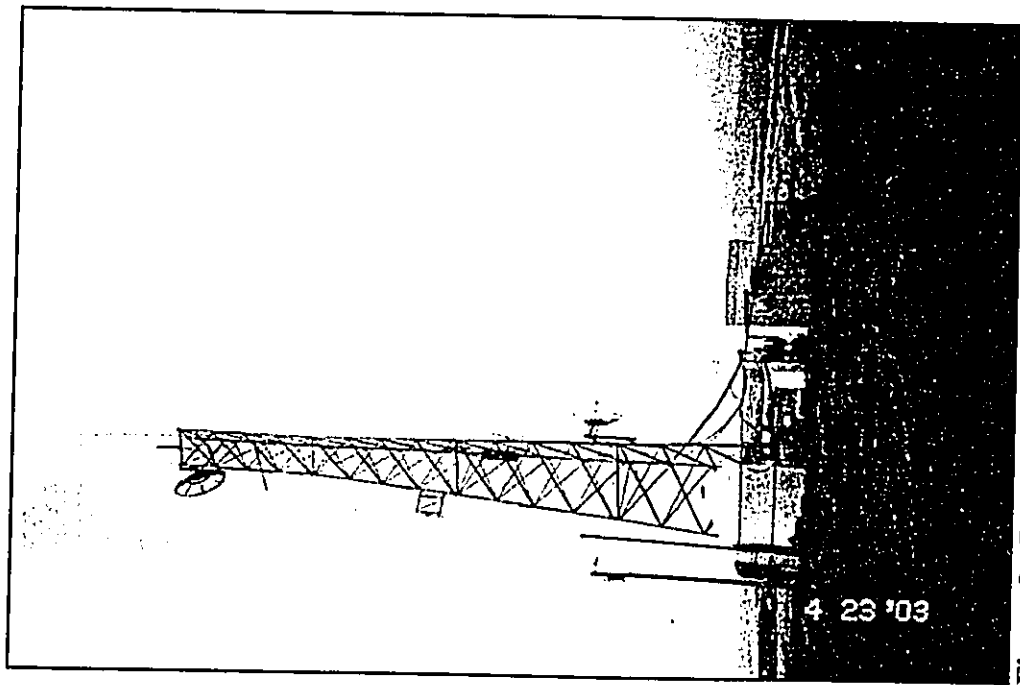


Figure 3: Present South Point Tower. View to North

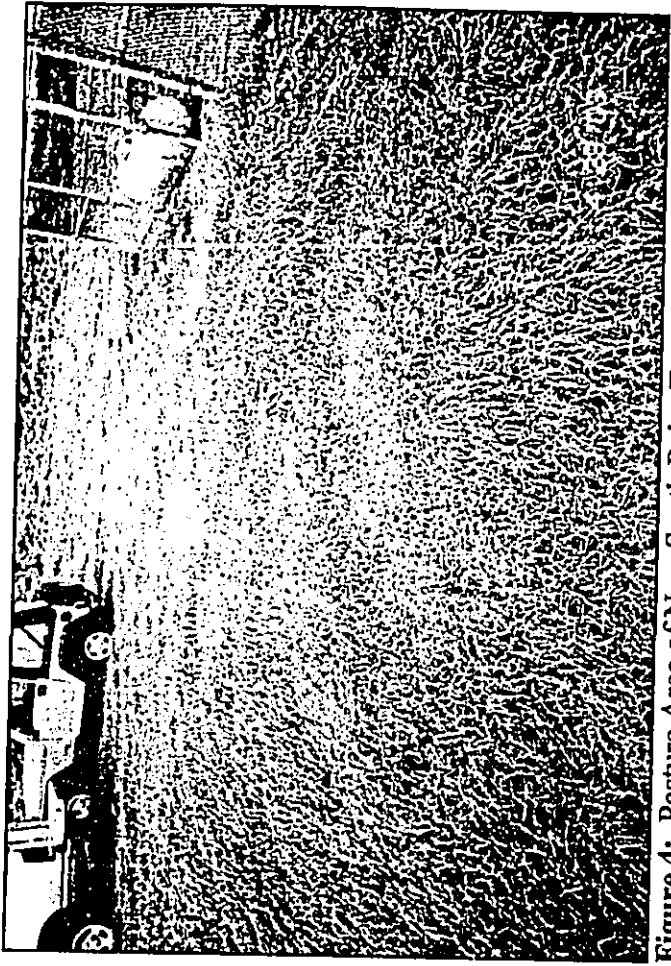


Figure 4: Pasture Area of New South Point Tower. View to East.

Dr. H. McEldowney
601 Kamokila Blvd., Rm. 555
Kapolei, Hawai'i 96707

April 28, 2003

Subject: Review of the County of Hawai'i Facility at Kauna Point (Figures 1 through 3)

Dear Dr. McEldowney:

Scientific Consultant Services, Inc. (SCS) is under contract to PBR, Hawai'i, to evaluate and make recommendations to the State of Hawai'i Historic Preservation Department (SHPD) regarding digital upgrading of the County of Hawai'i's radio communication facilities. The basis for this consultation is 36 CFR Part 800.

PROJECT NAME: Kauna Point **ADDRESS:** Manukā Quad. TMK:9-1-001:003

PROJECT DESCRIPTION: The present tower is to undergo an upgrade consisting of a minor duplication. No magnitude difference is anticipated.

EXISTING CONDITIONS: Presently, a 160-foot tower and a shelter are located within a fenced enclosure.

WORK COMPLETED: Records search and site visit.

RESULTS:

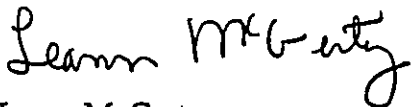
Records Search (½ mile radius in TMK): Archaeological Site 10-71-2159; Hawai'i Register #2-21-81

Field Survey: April 21, 2003

EFFECTS RECOMMENDATION: No adverse effect.

Based on §800.4 (d), Scientific Consultant Services, Inc. requests that SHPD concur to our determination that no historic properties will be affected by this undertaking, as documented in this transmittal. In addition, pursuant to Act 50, SCS has determined no effect on access to hunting and fishing areas, or on the Kaiaka site area. If you have any questions or comments regarding the letter, please contact me by phone at (808) 597-1182 or by e-mail at scs@scshawaii.com.

Sincerely,



Leann McGerty
SCS Senior Archaeologist

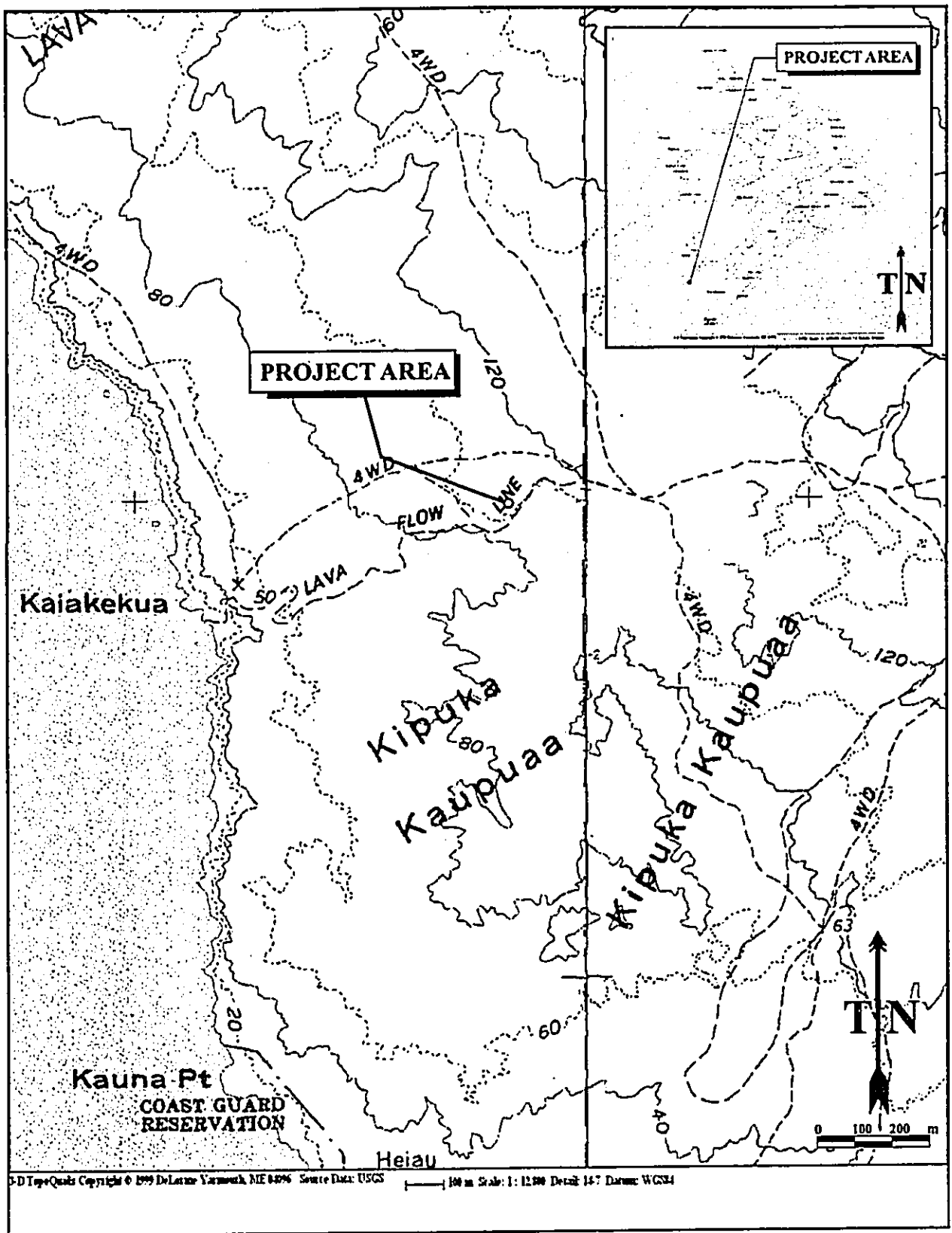


Figure 1: USGS Manukā Quadrangle Showing Project Area.

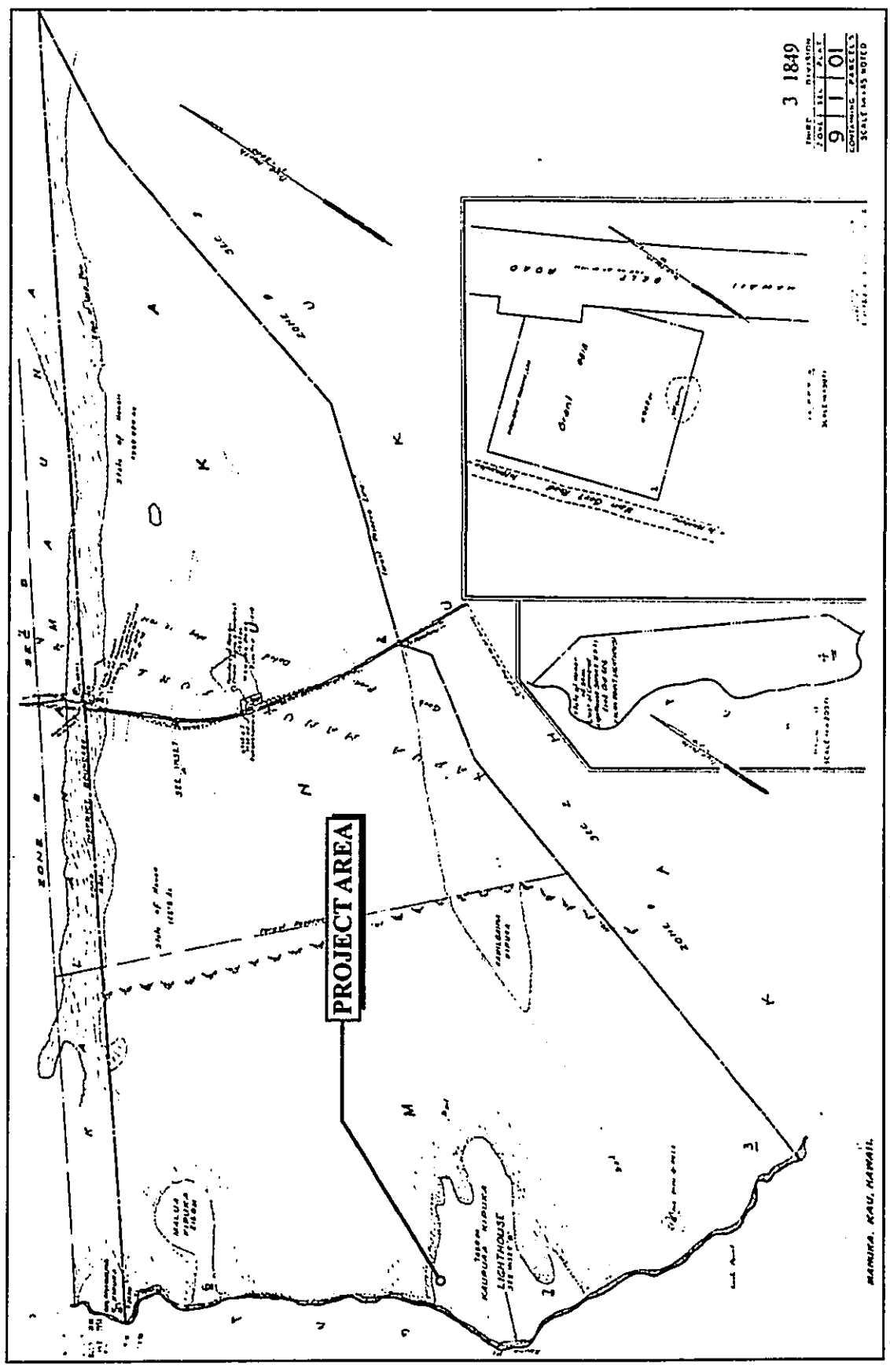


Figure 2: Tax Map Key [TMK] 9-1-01 Showing Project Area.

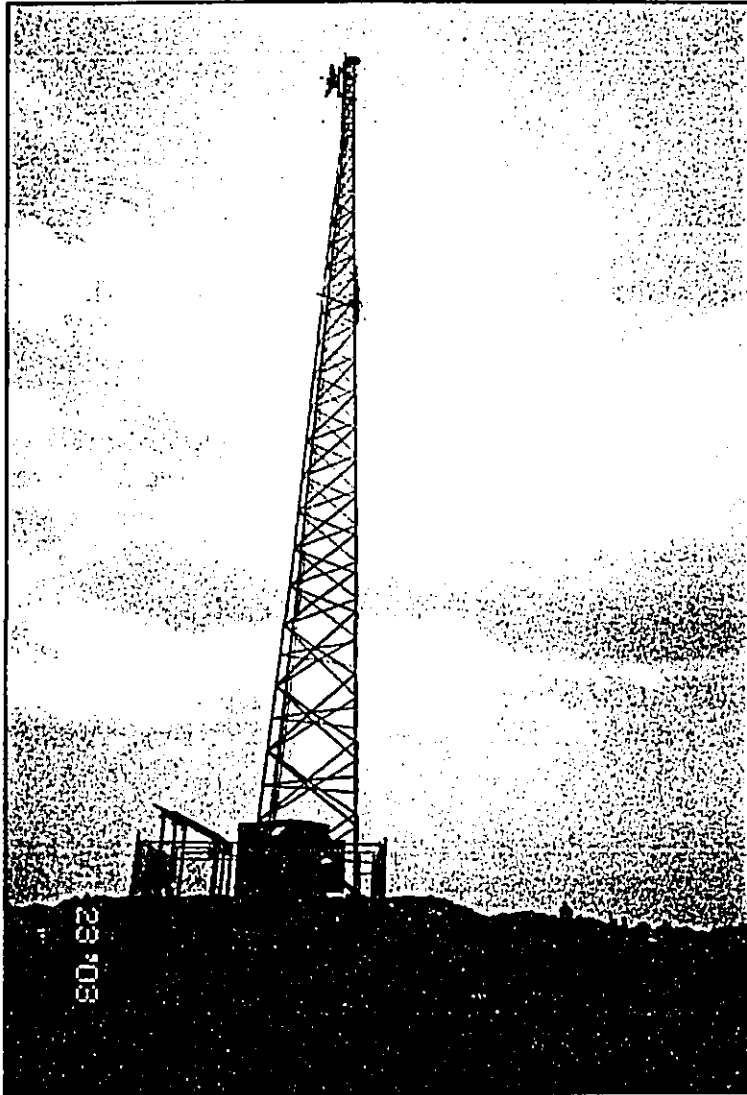


Figure 3: Present Kauna Point Tower. View to North.

Dr. H. McEldowney
601 Kamokila Blvd., Rm. 555
Kapolei, Hawai'i 96707

April 28, 2003

Subject: Review of the County of Hawai'i Facility at 'Ōhi'a Mill (Figures 1 through 4)

Dear Dr. McEldowney:

Scientific Consultant Services, Inc. (SCS) is under contract to PBR, Hawai'i, to evaluate and make recommendations to the State of Hawai'i Historic Preservation Department (SHPD) regarding digital upgrading of the County of Hawai'i's radio communications facilities. The basis for this consultation is 36 CFR Part 800.

PROJECT NAME: 'Ōhi'a Mill

ADDRESS: Pāpā Quad. TMK:8-8-001:003

PROJECT DESCRIPTION: A new tri-legged self-supporting tower and concrete shelter will be located immediately northeast of the present tower enclosure. A magnitude difference of 50 feet is expected.

EXISTING CONDITIONS: Presently, there is a 100-foot tower and a shelter within a fenced enclosure. Site has been previously machine graded to bedrock.

WORK COMPLETED: Records search and site visit.

RESULTS:

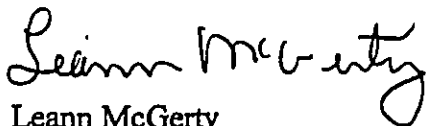
Records Search (½ mile radius in TMK): No archaeological or historic properties.

Field Survey: 24 April 28, 2003

EFFECTS RECOMMENDATION: No effect.

Based on §800.4 (d), Scientific Consultant Services, Inc. requests that SHPD concur to our determination that no historic properties will be affected by this undertaking, as documented in this transmittal. If you have any questions or comments regarding the letter, please contact me by phone at (808) 597-1182 or by e-mail at scs@scshawaii.com.

Sincerely,



Leann McGerty
SCS Senior Archaeologist

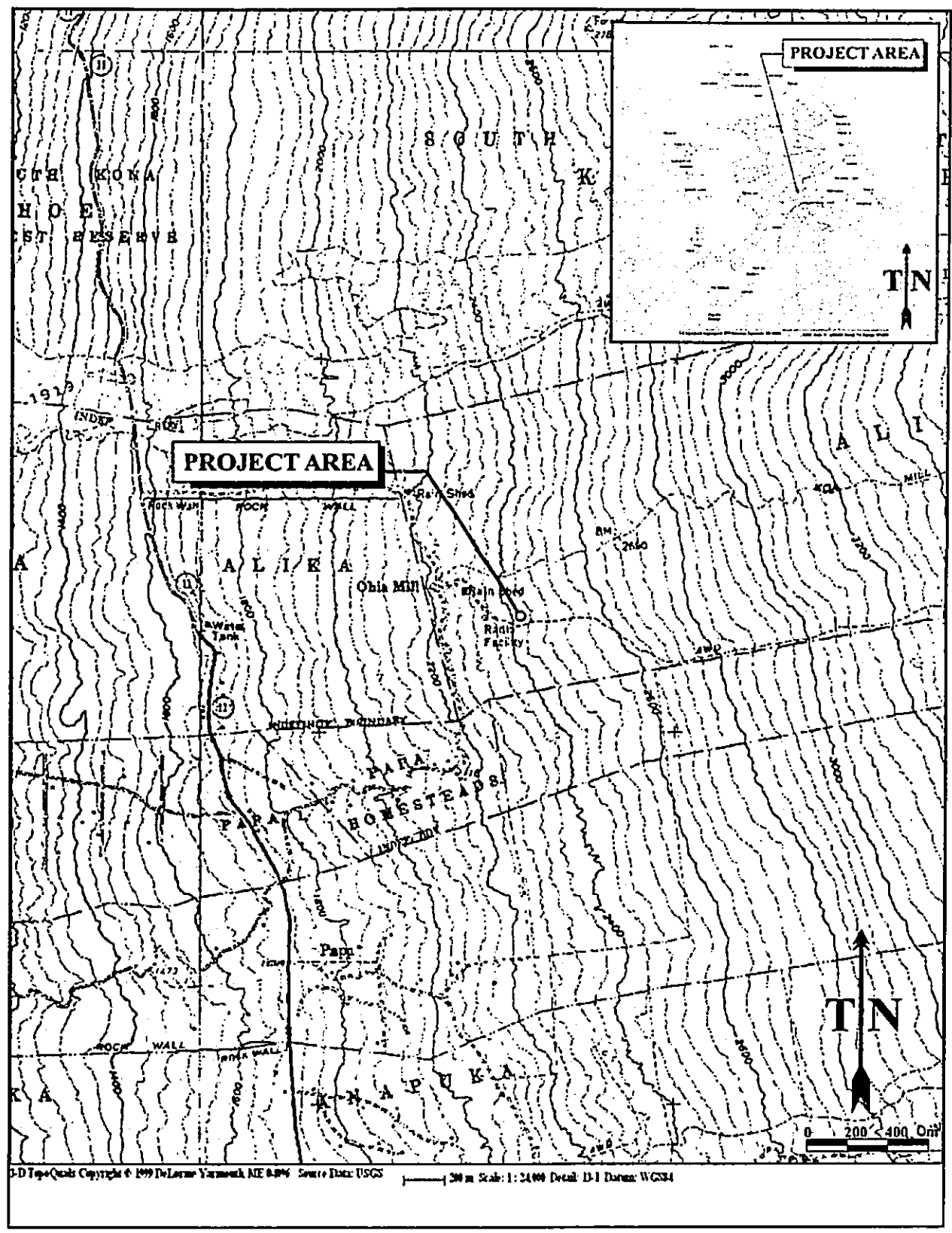


Figure 1: USGS Pāpā Quadrangle Showing Project Area

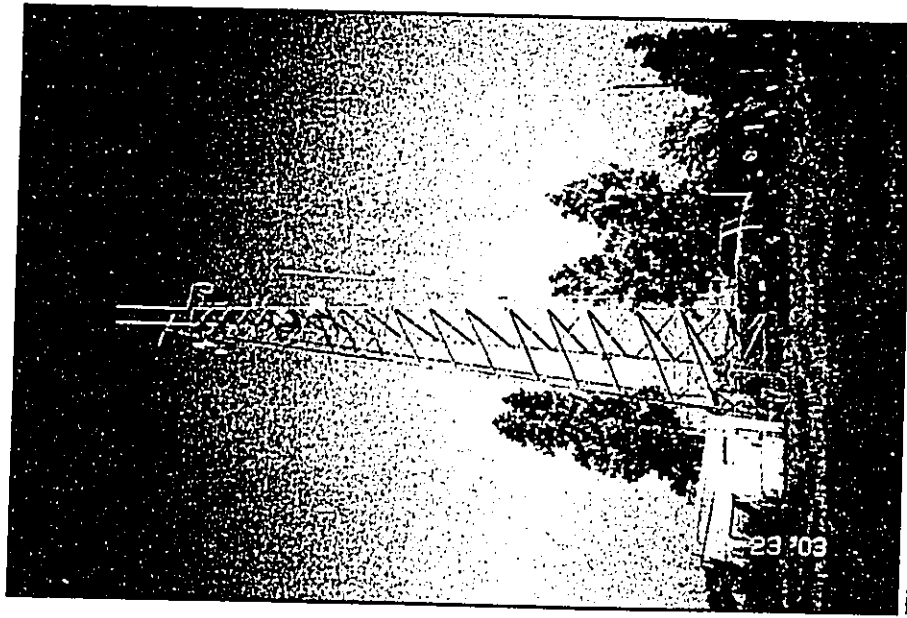


Figure 3: Present Tower on Ohia Mill Site.
View to West.

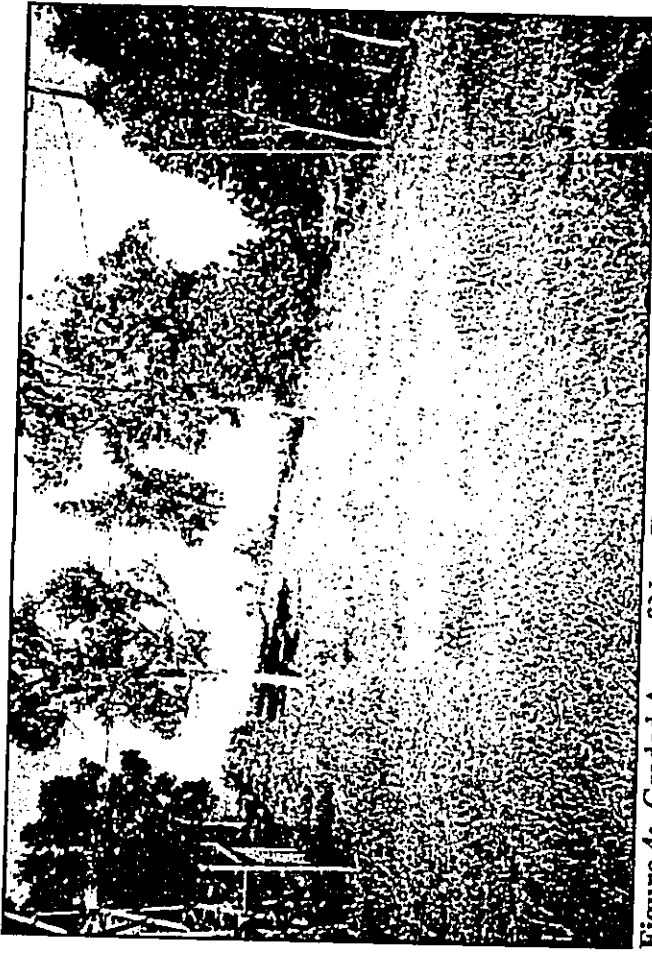


Figure 4: Graded Area of New Tower. View to West.

Dr. H. McEldowney
601 Kamokila Blvd., Rm. 555
Kapolei, Hawai'i 96707

April 28, 2003

Subject: Review of the county of Hawai'i Facility at Kailua Police Station (Figures 1 through 4)

Dear Dr. McEldowney:

Scientific Consultant Services, Inc. (SCS) is under contract to PBR, Hawai'i, to evaluate and make recommendations to the State of Hawai'i Historic Preservation Department (SHPD) regarding digital upgrading of the County of Hawai'i's radio communications tower facilities. The basis for this consultation is 36 CFR Part 800.

PROJECT NAME: Kailua Police Station **ADDRESS:** Kailua Quad. TMK:7-4-020:020

PROJECT DESCRIPTION: A new tri-legged self-supporting tower and a shelter will be located immediately west of the present tower enclosure. A magnitude difference of 40 feet is expected.

EXISTING CONDITIONS: Presently, there is a 60-foot tower and concrete shelter within a large, fenced enclosure/parking lot. Site has been previously machine graded and paved as part of the parking facilities in back of the present Kailua Police Station.

WORK COMPLETED: Records search and site visit.

RESULTS:

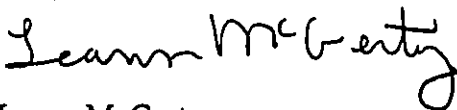
Records Search (1/2 mile radius in TMK): No archaeological or historic properties.

Field Survey: April 18, 2003

EFFECTS RECOMMENDATION: No effect.

Based on §800.4 (d), Scientific Consultant Services, Inc. requests that SHPD concur to our determination that no historic properties will be affected by this undertaking, as documented in this transmittal. If you have any questions or comments regarding the letter, please contact me by phone at (808) 597-1182 or by e-mail at scs@scshawaii.com.

Sincerely,



Leann McGerty
SCS Senior Archaeologist

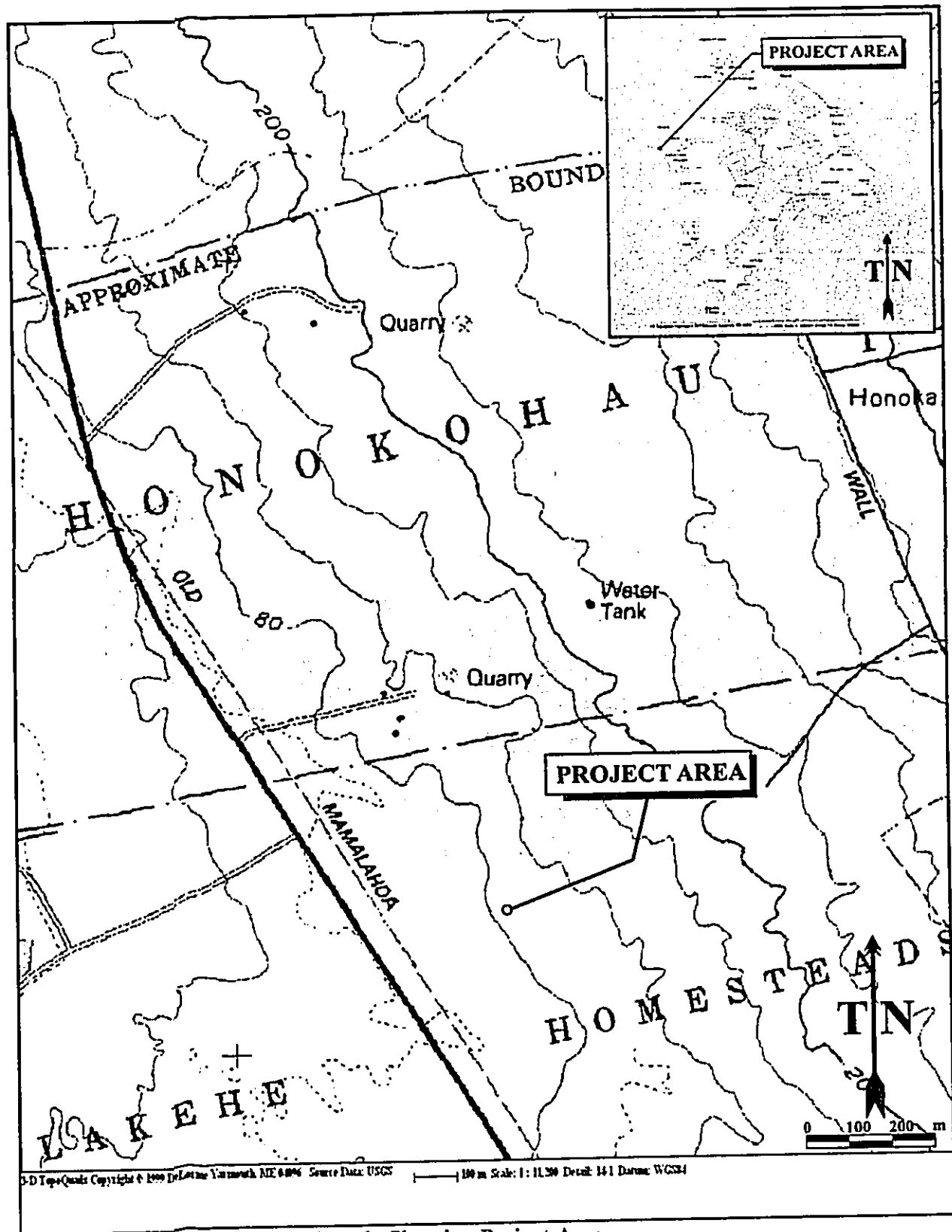


Figure 1: USGS Kailua Quadrangle Showing Project Area.

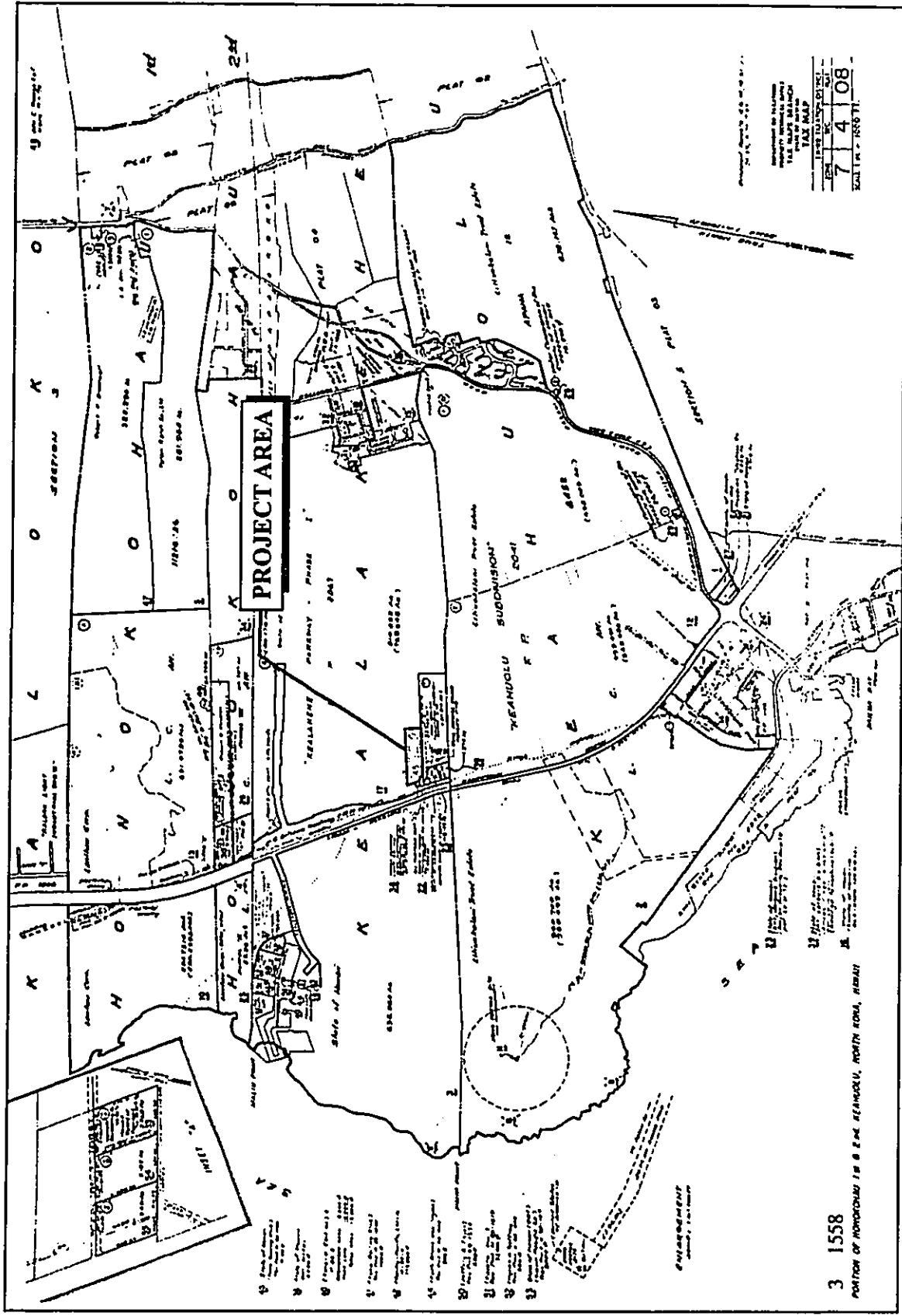


Figure 2: Tax Map Key [TMK] 7-4-08.

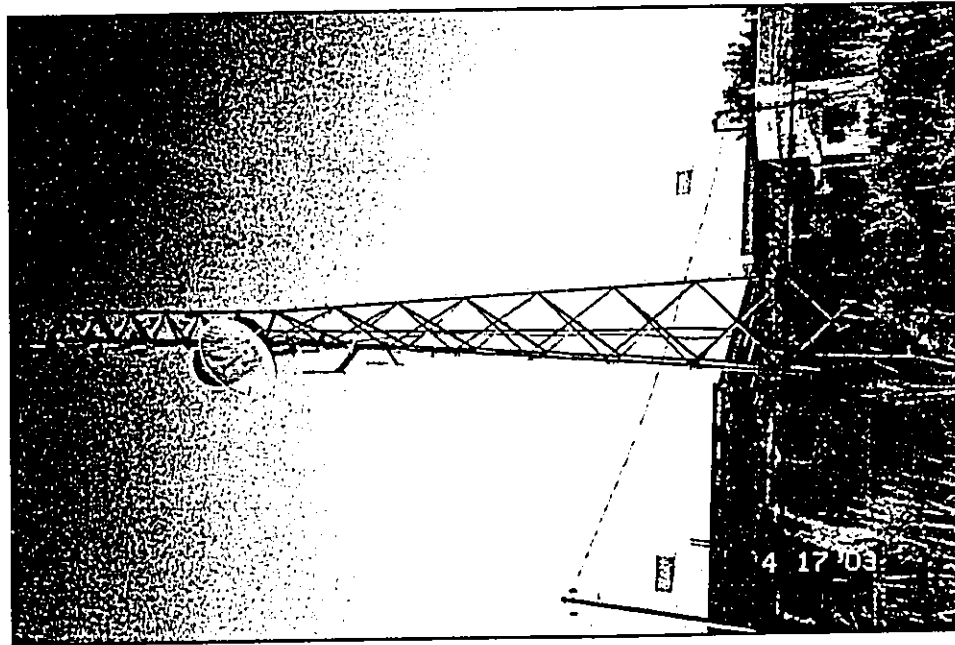


Figure 3: Present Tower at Kailua Police Station.
View to South.



Figure 4: Disturbed Area in Vicinity of New Tower Location. View to South.

Dr. H. McEldowney
601 Kamokila Blvd., Rm. 555
Kapolei, Hawai'i 96707

April 28, 2003

Subject: Review of the County of Hawai'i Facility at Moanuahea (Figures 1 through 4)

Dear Dr. McEldowney:

Scientific Consultant Services, Inc. (SCS) is under contract to PBR, Hawai'i, to evaluate and make recommendations to the State of Hawai'i Historic Preservation Department (SHPD) regarding digital upgrading of the County of Hawai'i's radio communication facilities. The basis for this consultation is 36 CFR Part 800.

PROJECT NAME: Moanuahea **ADDRESS:** Kailua Quad. TMK:7-2-007:001

PROJECT DESCRIPTION: A new tri-legged self-supporting tower and shelter will be located immediately east of the present tower enclosure. A magnitude difference of 20 feet is expected.

EXISTING CONDITIONS: Presently, there is a 60-foot tower and a shelter within a fenced enclosure. The area of new construction has been previously cleared and machine graded.

WORK COMPLETED: Records search and site visit.

RESULTS:

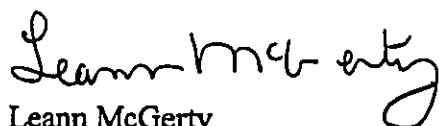
Records Search (1/2 mile radius in TMK): No archaeological or historic properties.

Field Survey: April 24, 2003

EFFECTS RECOMMENDATION: No effect.

Based on §800.4 (d), Scientific Consultant Services, Inc. requests that SHPD concur to our determination that no historic properties will be affected by this undertaking, as documented in this transmittal. If you have any questions or comments regarding the letter, please contact me by phone at (808) 597-1182 or by e-mail at scs@scshawaii.com.

Sincerely,



Leann McGerty
SCS Senior Archaeologist

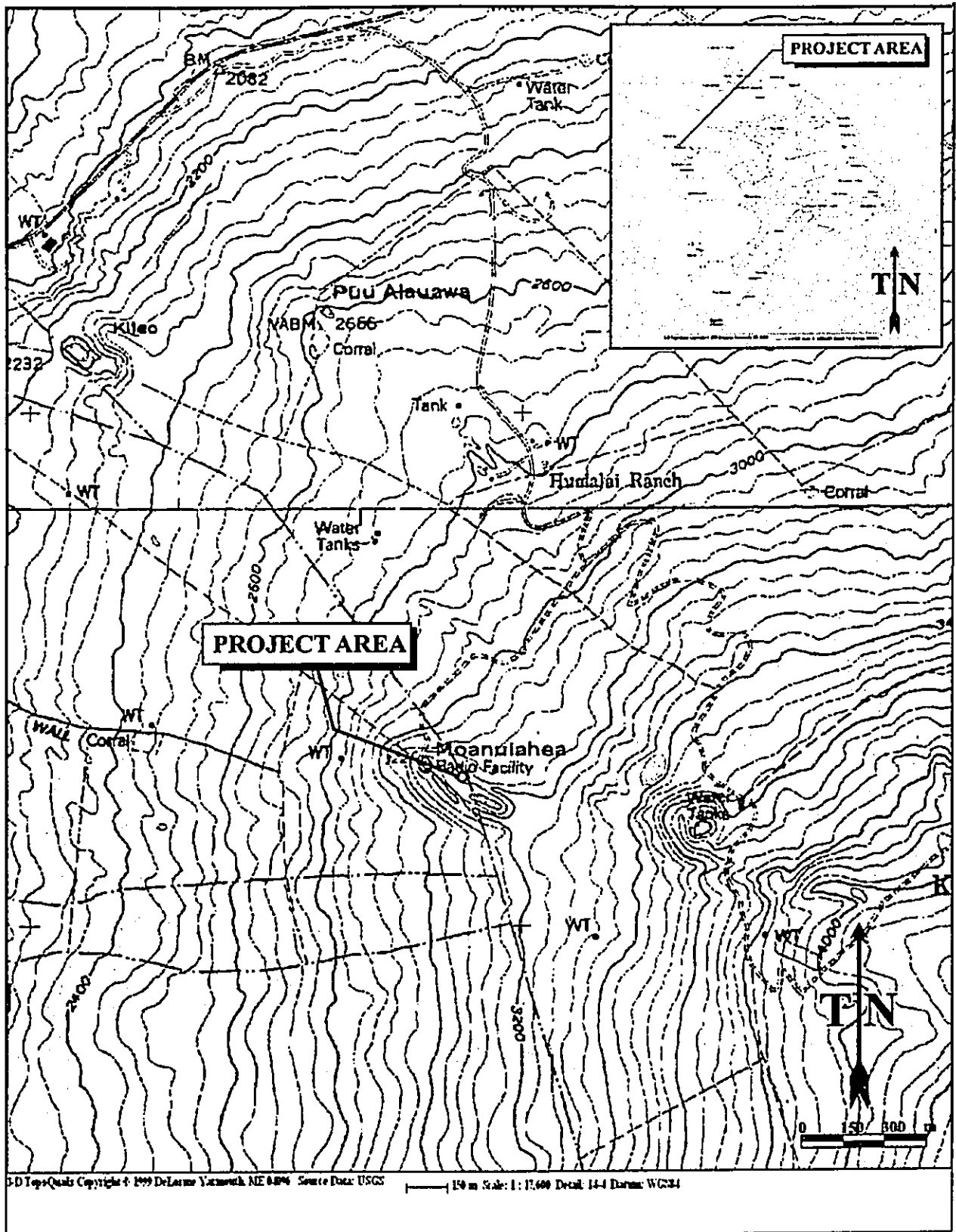


Figure 1: USGS Kailua Quadrangle Showing Project Area.

April 28, 2003

Dr. H. McEldowney
601 Kamokila Blvd., Rm. 555
Kapolei, Hawai'i 96707

Subject: Review of the County of Hawai'i Facility at Kulani Cone (Figures 1 through 4)

Dear Dr. McEldowney:

Scientific Consultant Services, Inc. (SCS) is under contract to PBR, Hawai'i, to evaluate and make recommendations to the State of Hawai'i Historic Preservation Department (SHPD) regarding digital upgrading of the County of Hawai'i's radio communications facilities. The basis for this consultation is 36 CFR Part 800.

PROJECT NAME: Kulani Cone **ADDRESS:** Kulani Quad. TMK:9-9-001:021

PROJECT DESCRIPTION: A new tri-legged self-supporting tower and a shelter will be located immediately west and northwest of the present tower enclosure. A magnitude difference of 70 feet is expected.

EXISTING CONDITIONS: Presently, a 180-foot tower is located on the site. The area of new construction has been previously cleared and machine graded.

WORK COMPLETED: Records search and site visit.

RESULTS:

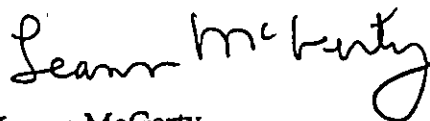
Records Search (½ mile radius in TMK): No archaeological or historic properties.

Field Survey: April 22, 2003

EFFECTS RECOMMENDATION: No effect.

Based on §800.4 (d), Scientific Consultant Services, Inc. requests that SHPD concur to our determination that no historic properties will be affected by this undertaking, as documented in this transmittal. In addition, pursuant to Act 50, SCS has determined no effect on access to hunting, gathering, or recreational areas in adjacent Hawai'i Volcano's National Park and other forest preserve areas. If you have any questions or comments regarding the letter, please contact me by phone at (808) 597-1182 or by e-mail at scs@scshawaii.com.

Sincerely,



Leann McGerty
SCS Senior Archaeologist

April 28, 2003

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601 Kamokila Blvd., Rm. 555
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Sincerely,

Leann McGerty
SCS Senior Archaeologist

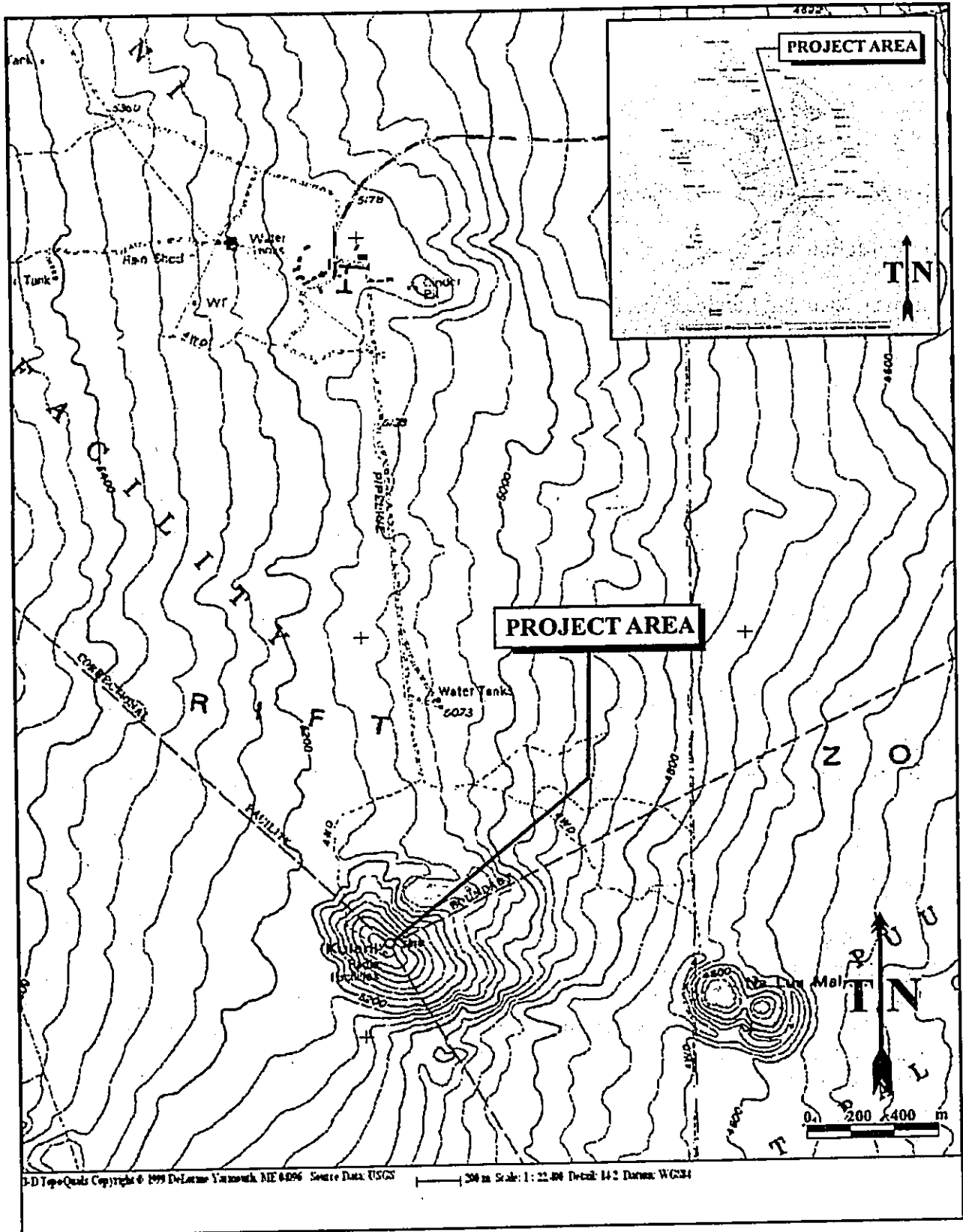


Figure 1: USGS Kulani Quadrangle Showing Project Area.

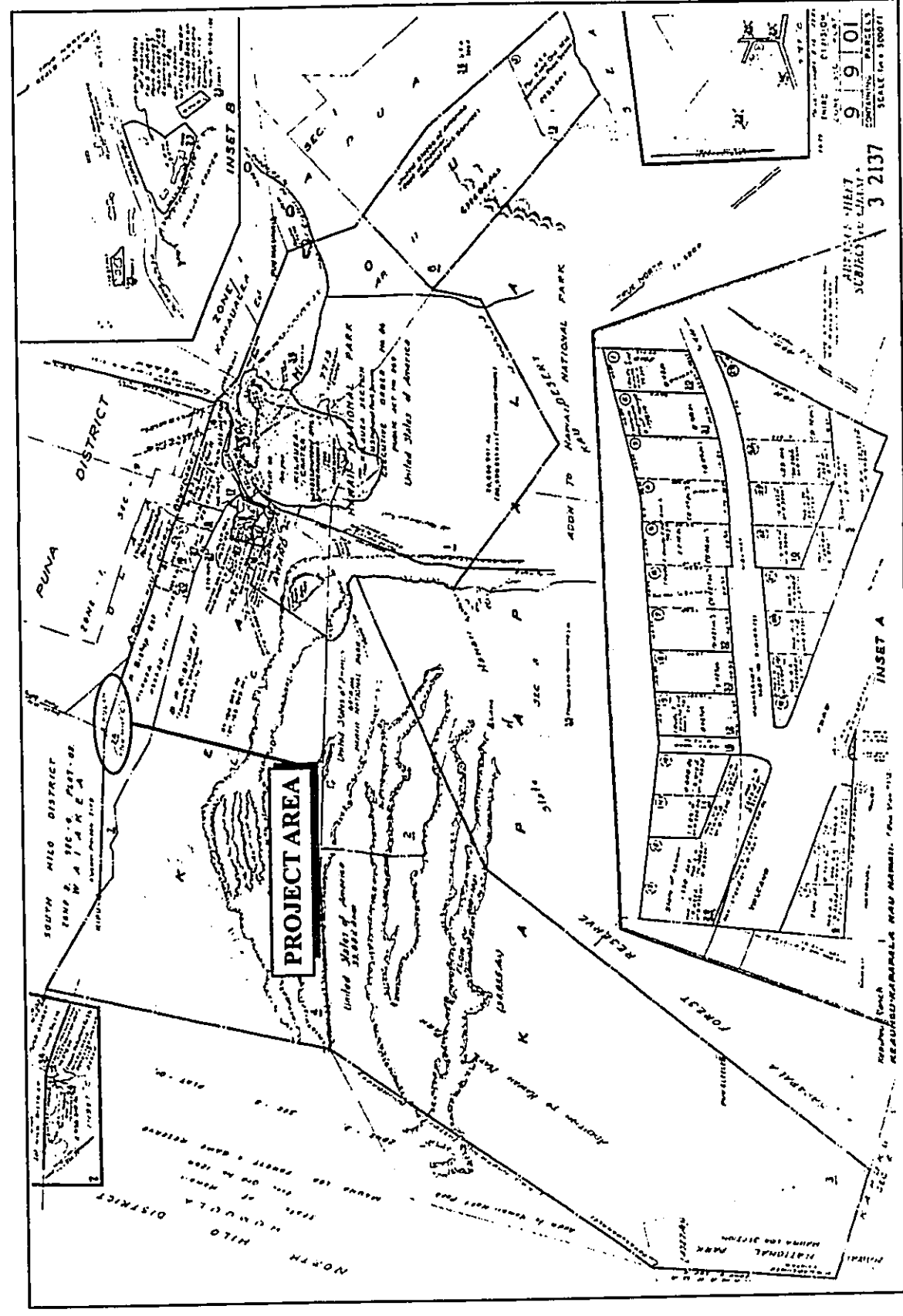


Figure 2: Tax Map Key [TMK] Showing Project Area.



Figure 3: Graded Area for New Kulani Cone Tower. View to East.



Figure 4: Graded Area for New Kulani Cone Shelter. View to West.

APPENDIX B
Records Search

Mr. James Leonard
PBR Hawai'i
101 Aupuni Street, Suite 310
Hilo Hawai'i 96720

April 29, 2003

Subject: Records Search Results for Eight Scientel America Existing Tower Facilities on Hawai'i Island

Dear Mr. Leonard:

Scientific Consultant Services, Inc. (SCS) is under contract to provide a records search and site survey for eight County of Hawai'i tower facilities to be constructed by Scientel America, Inc. The records search was performed at the State Historic Preservation Division, located at Kapolei, 'Ewa, Hawai'i; it included a review of all recorded historic and prehistoric archaeological sites within a one-half mile radius of the projects' TMK, as well as a review of known cultural resource survey and excavation reports. In addition, we examined the National Register of Historic Places (NRHP) and the Hawai'i Registry of Historic Places (HRHP), and Inventory of Historic Places (IHP). The following are the results of the records search:

Site Name	USGS Quad	Archaeology Sites	Reports	Historic Registers
'Iolehaehae	Keanakolu	None	None	None
Na'alehu Pasture	Na'alehu	None	None	None
South Point	Kahuku	None	None	None
Kauna Point	Manukā	10-71-2159	None	HR#2-21-81
'Ōhi'a Mill	Pāpā	None	None	None
Kailua Police Station	Kailua	None	None	None
Moanuahea	Kailua	None	None	None
Kulani Cone	Kulani	None	None	None

Thank you for the opportunity to assist you on this project. If SCS can be of further assistance, or if you have any questions concerning this letter. Please contact me at (808) 597-1182.

Sincerely,

Leann McGerty
SCS Senior Archaeologist

2003-09-08-HA-FEA

SEP 8 2003

FILE COPY

(HAWAII COUNTY POLICE DEPT.)

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

FINAL ENVIRONMENTAL ASSESSMENT

HAWAII POLICE DEPARTMENT
COUNTY OF HAWAII



August 2003

**COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)**

FINAL ENVIRONMENTAL ASSESSMENT

**HAWAII POLICE DEPARTMENT
COUNTY OF HAWAII**



Prepared by:

PBR HAWAII
Land Planning•Environmental Studies•Landscape Architecture
Hilo, Hawaii

For:
Scientel America, Inc.

August 2003

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

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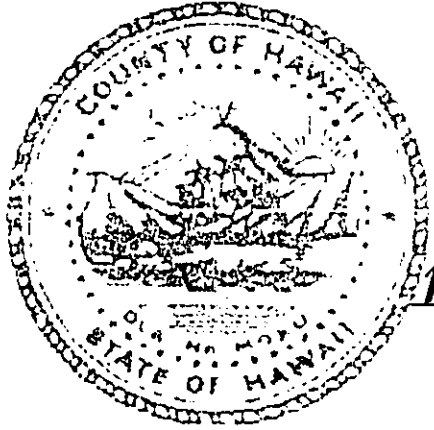
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1. INTRODUCTION

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

1.0 INTRODUCTION

1.1 PROJECT SUMMARY

Project Name: County of Hawaii Digital Upgrade Microwave Project
(Emergency Radio Facilities)

Proposing/Lead Agency: Hawaii Police Department
County of Hawaii
349 Kapiolani Street
Hilo, Hawaii 96720

Approving Agency: County of Hawaii
Hawaii Police Department

Proposed Action: Upgrade of the existing emergency radio facilities at 19 island-wide locations to replace the existing 2GHz analog system to a new 6GHz digital system to ensure vital police, fire, and other County communications functions as required by the FCC

Site Identification, Location, TMK, Land Use Designations, and Ownership:

Table 1. County of Hawaii Emergency Radio Facilities

Site	Location / District	TMK	State Land Use	County Zoning	Land Owner
Capt. Cook Police Station	82-6130 Mamalahoa Hwy; Captain Cook / South Kona	8-2-001:084	Urban	A-1a	State DAGS
Fire Central	466 Kinoole St; Hilo / South Hilo	2-3-018:033	Urban	CG-7.5	County
Hamakua Police Station	45-3380 Mamane St; Honokaa / Hamakua	4-5-006:003	Urban	RS-7.5	State DAGS
Hilo Baseyard	East Lanikaula St; Hilo / South Hilo	2-2-058:018	Urban	MG-1a	County
Huehue Ranch	North Kona	7-2-002:013	Agricultural	A-5a	HELCO
Iolehaehae	Hamakua	4-1-006:007	Agricultural	A-40a	State DLNR
Kahua Ranch (Construction by State DAGS)	Kahua Ranch / North Kohala	5-9-002:002	Agricultural	A-20a	Kahua Ranch
Kailua Police Station	74-5221 Queen Kaahumanu Hwy; Kealakehe / North Kona	7-4-020:021	Conservation	Open	County
Kamehameha Park	Kamehameha Park; Kapaau / North Kohala	5-4-009:004	Urban	RS-15	County
Kau Police Station	95-5353 Mamalahoa Hwy; Naalehu / Kau	9-5-012:037	Agricultural	A-20a	County
Kau State Bldg (Demolition Only)	Mamalahoa Hwy; Naalehu / Kau	9-5-021:010	Urban	CV-10	State DAGS
Kauna Point	Manuka Natural Area Reserve; Manuka / Kau	9-1-001:003	Conservation	Open	State DLNR
Kulani Cone	Above Kulani Correctional Facility / Kau	9-9-001:024	Conservation	Not zoned	KSBE

**COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)**

Site	Location / District	TMK	State Land Use	County Zoning	Land Owner
Moanuaieha	Above Makalei Golf Course / North Kona	7-2-007:001	Conservation	Not zoned	Makalei Corp.
Naalehu Pasture	Naalehu / Kau	9-5-007:030	Agricultural	A-20a	Kau Agribusiness Co., Inc.
Ohia Mill	Yee Hop Ranch / South Kona	8-8-001:003	Agricultural	A-5a	C.Q. Yee Hop Ltd.
Public Safety Building	349 Kapiolani St., Hilo / South Hilo	2-4-025:028	Urban	RM-1	County
Puna Police Station	16-200 Pilimua St.; Keaau / Puna	1-6-143:038	Urban	CV-10 & RS-15	W.H. Shipman
South Point	South Point / Kau	9-3-001:006	Agricultural	Not zoned	Daleco Ranch (lc.) / KSBE
Waimea Police Station	57-5185 Kamamalu St; Waimea / South Kohala	6-7-002:011	Agricultural	A-40a	State DAGS

Actions Requested: 1) County Permits: Plan Approval, Special Use Permit; 2) Conservation District Use Permit; 3) FCC registration; 4) FAA review

1.2 IDENTIFICATION OF THE APPLICANT

The Hawaii Police Department is one of the primary users of the County-wide emergency radio system. The Hawaii Police Department is responsible for law enforcement within the County under the leadership of the Police Chief.

1.3 IDENTIFICATION OF THE CONTRACTOR

The County of Hawaii has retained Scientel America, Inc. to design and construct the replacement radio system pursuant to the County's procurement laws. Scientel America is based in Chicago, Illinois, is a comprehensive, turnkey telecom system provider specializing in "ground floor up" services including design and engineering, construction and installation, program and project management, and testing, tuning, and turn-up services. Additional information is available at www.scientelamerica.com.

1.4 CHAPTER 343, HAWAII REVISED STATUTES COMPLIANCE

The implementation of the planned improvements to upgrade the County of Hawaii's emergency radio telecommunications facilities at 19 islandwide sites will utilize public funds (19 sites) and public lands (12 sites), and State Conservation District lands (4 sites). Thus, these "triggers" require compliance with Chapter 343, Hawaii Revised Statutes (HRS) to consider the potential environmental impacts.

Concurrently with the review of the subject County of Hawaii environmental assessment, the State of Hawaii Department of Accounting and General Services (DAGS) has issued a separate environmental assessment entitled *Anuenue (formerly Rainbow) Radio Facilities and Tower, Kahua Ranch Site, North Kohala District, Hawaii* (Wilson Okamoto Corporation 2003) for the State-owned site at Kahua Ranch site. This site is part of the backbone infrastructure of the

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

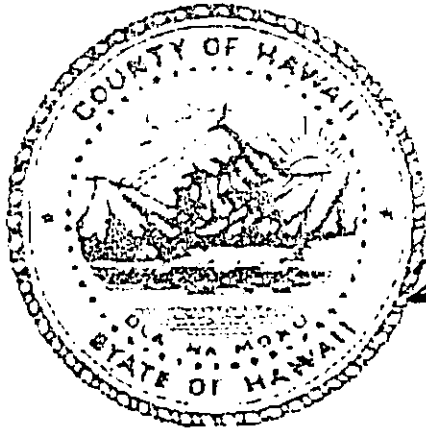
County system; thus, this Kahua Ranch site is described herein as one of the 19 sites. The County will install its antenna and radio equipment at this State facility.

This Environmental Assessment (EA) is prepared pursuant to Chapter 343, HRS and Hawaii Administrative Rules, Title 11, State of Hawaii Department of Health, Chapter 200, Environmental Impact Statement Rules.

1.5 PUBLIC CONSULTATION FOR THE ENVIRONMENTAL ASSESSMENT

Pre-assessment consultation was initiated pursuant to DOH EIS Rules Section 11-200-15 for the preparation of the Draft EA with County, State, and Federal agencies through written letters requesting comments and through community informational and scoping meetings. The letters which were received and a summary of the community comments are described in Section 8 of this assessment.

The Draft EA was published by the Office of Environmental Quality Control in *The Environmental Notice* on July 8, 2003. Comments which were received and the applicant's responses are included in Section 9 of this assessment.



2. PROJECT DESCRIPTION

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.0 PROJECT DESCRIPTION

2.1 PROJECT PURPOSE

The County of Hawaii is in the process of upgrading its islandwide emergency radio system for vital police and fire communication functions. The existing analog system was installed in the 1970's and is now out-dated and in need of replacement to a digital system. The existing 2 GHz analog microwave system will be upgraded to a new 6 GHz digital microwave system and will be in compliance with the Federal Communication Commission (FCC) recent rule change requirements.

The project purpose is to design and construct a modern high capacity digital interconnect to replace the analog radio channels used by the numerous County agencies, as well as State and Federal agency co-locaters, to facilitate voice, digital radio, and in subsequent phases, video and data communications. The upgraded "backbone" infrastructure of a system is a prerequisite for this future addition of advanced telecommunications hardware and software.

2.2 NEED FOR THE PROJECT

2.2.1 Public Safety and Emergency System

The system is a public facility to be used by public agencies for public purposes. These include day to day emergencies, public safety, law enforcement, civil defense missions, and most recently, heightened emergency response for homeland security and potential terrorist threats.

Within the County of Hawaii, the system is responsible for communications for the Police Department, Fire Department, Public Works Department, Civil Defense, Department of Parks and Recreation, Board of Water Supply, and the Mayor's Office.

In addition, co-locator agencies will include State Departments of Transportation, Land and Natural Resources, and Department of Health - Emergency Medical Services and Federal agencies including the Federal Bureau of Investigation, Department of the Army Pacific Mobile Emergency Radio System, National Weather Service, and Hawaii Volcanoes Observatory.

To fulfill their public service missions, these government agencies rely on telecommunications to communicate and transmit information and data between offices and facilities as well as to communicate with personnel in the field. The conversion to a digital system is necessary infrastructure to handle the expanding voice and data communications requirements of the public safety community.

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2.2.2 Replacement of Aging and Deteriorating Facilities

In a 1995 feasibility study¹ of the County's emergency radio system the analysis concluded that the aged radio facilities had many deficiencies and that the system lacked expansion capacity for the future and eliminated the possibility of using advanced state-of-the-art telecommunication technologies. The study also noted that analog systems have become obsolete with the introduction of the more flexible and efficient digital systems; thus, obtaining replacement parts for proper maintenance is difficult, if not, impossible.

The conclusions of the study were based on an assessment of the system's effectiveness (in 1995), community demographics and projections for growth, forecast of communications traffic and the need for system expansion, the status of each radio site (e.g. towers, shelters and equipment), and the operating microwave and computer systems.

The study recommended solutions to the pressing and serious needs of public safety providers and other government users and stated that a proper infrastructure was a fundamental prerequisite to support additional technology such as mobile data terminals and the National Information Crime Center (NCIC) Project 2000. Implementing these new technologies offer solutions to the needs of the various departments and provide immediate and continuing increases in operating efficiency. However, the report concluded that a proper infrastructure was needed to support these advances.

The improvements proposed herein will significantly upgrade the infrastructure that supports local government communications. Thus, the proposal for a digital upgrade to the microwave system will modernize the backbone microwave infrastructure to subsequently support a state-of-the-art system.

2.2.3 Reassignment of Analog Frequencies

The conversion to high capacity digital microwave has been forced by the federally mandated reassignment of analog microwave frequencies to personal communications systems (PCS or cellular telephones carriers). This action by the Federal Communications Commission (FCC) auctioned off the portion of the 2 GHz bandwidth used by public safety users to PCS carriers, forcing public safety responders to relocate to the 6 GHz bandwidth by 2005.

The FCC has set forth rules and regulations to allow the PCS carriers to cost-share with public agencies in the relocation off the frequency to provide an incentive for municipalities to relocate to the 6 GHz bandwidth sooner than 2005. Consequently, AT&T Wireless and T-Mobile are contributing over \$1 million each to help defray costs in exchange for the County of Hawaii relocating off the frequencies.

¹ Schema Systems, Inc. July 1995

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2.3 DISPATCH CENTER

The Hawaii Police Department dispatches from a central location at the Public Safety Building (PSB) at 349 Kapiolani Street in Hilo (Police Headquarters). The dispatch center is also the County wide E-911 answering point, receiving all emergency 911 telephone calls and business calls. Depending on the nature of the call, it is routed to the call taker or police radio console responsible for the specific geographic area of the caller or the Fire Department. The Dispatch Center serves only to route calls. The call taker receives calls for police service, interrogates the citizen on the nature of the event, fills out a dispatch card, and walks it to the correct radio console position.

2.4 COUNTY USERS OF THE SYSTEM

There are several Hawaii County departments that utilize radio communications. Primary among these are the Police and Fire Departments, each using several radio channels. The other departments share a common local government radio channel, except for the Department of Water Supply, which has a separate channel. Since all of the County's radio systems are in the VHF high band spectrum, many mobile and portable radios carry channels of other departments.

2.4.1 Hawaii Police Department

The Hawaii County Police Department is responsible for law enforcement and is headed by the Chief of Police. There are three Department Bureaus – Administration, Field Operations, and Criminal Investigations. The radio communications section and radio maintenance are in the Administration Bureau.

There are eight primary police stations serving the County:

- South Hilo District – 349 Kapiolani St., Hilo 96720 (Public Safety Building / Police Headquarters)
- North Hilo District – 36-2283 Old Mamane St., Laupahoehoe 96764
- Hamakua District – 45- 3380 Mamane St., Honokaa 96727
- South Kohala District – 57-5185 Kamamalu St., Kamuela 96743
- North Kohala District – 54-3900 Hawi-Niulii Rd, Kapaau 96755
- Kona District – 74-5221 Queen Kaahumanu Hwy, Kailua-Kona 96740
- Kau District – 95-5624 Mamalahoa Hwy, Naalehu 96772
- Puna District – 16-200 Pilimua St., Keaau 96749

There are also four police district sub-stations:

- South Kohala District – Waikoloa
- Kona District – Captain Cook
- Puna District – Pahoa
- Kau District – Naalehu

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The Police Department operates the radio shop, which performs many communications maintenance functions for many of the County agencies using mobile radios.

2.4.2 Fire Department

The Hawaii County Fire Department is responsible for fire and rescue activities throughout the island. The headquarters is in Hilo at 466 Kinoole Street. It is headed by a Chief and Support Deputy Chief, Battalion Chiefs, Captains, Inspectors, fire fighters, paramedics, and other support staff. It is the only Fire Department in the State of Hawaii that provides full-time paramedic services, which is operated under the auspices of the State Department of Health Emergency Medical Services (EMS) Division. The Fire Department also operates two rescue boats that are equipped with two-way radios; one is stationed in Hilo and one in Kailua.

2.4.2.1 Emergency Medical Services (EMS) Radio System

The Hawaii County Fire Department provides paramedic and ambulance services for the entire island. This service is supported by the State of Hawaii EMS radio system, which operates in the UHF spectrum. The Fire Department has UHF radio equipment in the rescue/ambulance vehicles, which allows communications to and from the dispatch center and local hospitals and with hospitals in Honolulu via the State microwave system. The Fire Department operates 20 rescue/ambulances from the following Stations: Central Fire Station (Hilo), Keau Station, Captain Cook, Honokaa Station, Waimea Station, Pahoa Station, Naalehu Station, South Kohala Station, North Kohala Station, and Waikoloa Station.

The ambulances are also equipped with a vehicular repeater (called a PAC-RT or "pack-rat") that allows paramedics to communicate through the system from a portable unit when away from the ambulance.

2.4.3 Department of Public Works

The Department of Public Works (DPW) radio system (sometimes called the Local Government Radio System or LGRS) operates in the VHF portion of the radio spectrum with mobile relays located at the four (4) remote sites of Iolehaehae, Kahua Ranch, Ohia Mill, and Naalehu Pasture. The County Civil Defense Agency is the FCC license holder for the system.

Numerous County agencies and offices share the system. There are approximately 300 mobile radios and 130 portable radios in use on the Public Works radio system.

None of the agencies listed below have 24-hour dispatch centers, such as the Police and Fire Departments. Dispatching is accomplished during normal working hours from agency offices in Hilo or from remote offices located throughout the County. Several agencies have remote control units at their offices that connect to a local VHF control station in Hilo for accessing the mobile relay at Iolehaehae. In addition, some agencies have a multi-channel remote unit that connects to the microwave system for accessing the mobile relays at Kahua Ranch, Ohia Mill, and Naalehu Pasture. This provides wide-area radio coverage.

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The users of the Department of Public Works radio system include the following Public Works divisions and other County offices:

- Road Division
- Traffic Division
- Automotive Maintenance Division
- Building Division
- Solid Waste Division
- Department of Parks and Recreation
- Mass Transit
- Mayor's Office
- Liquor Control
- Safety Division

2.4.4 Civil Defense

The Hawaii County Civil Defense Agency is responsible for all civil defense activities within the County. It is headquartered in the new Emergency Operations Center at the Public Safety Building in Hilo. Civil Defense is the licensee of the Public Works radio system.

To support its daily operation, it operates on the Public Works radio system, but has the capability to access the Police and Fire radio systems. Civil Defense also operates the County Emergency Operations Center and it is well equipped to operate on a variety of local County, State, Federal, and private radio systems. All emergency operations associated with earthquakes, tsunamis, volcanic eruptions, or other disasters are coordinated by the Civil Defense office.

2.4.5 Board of Water Supply

The Board of Water Supply (BWS) is responsible for maintaining the water supply and water distribution throughout the County. It operates its own VHF system on frequencies licensed in the Power Radio Services. It is headquartered in Hilo but has field offices at other locations in the County.

2.5 GEOGRAPHICAL CHALLENGES

The County of Hawaii is comprised of the largest island in the Hawaiian chain. It is nearly twice as large as the other islands combined with a total land area of 4,028 square miles (as compared to Oahu which is 597 square miles and Maui which is 727 square miles). The County also has two of the state's highest mountains, Mauna Kea, at 13,796 feet above sea level, and Mauna Loa at 13,679 feet, and the only active volcanoes of Mauna Loa and Kilauea. Thus, providing comprehensive radio coverage in Hawaii County is technically demanding and expensive because the topography of the island requires numerous sites and an abundance of equipment.

The challenges of providing an integrated system involve working with the physical terrain and providing the funds to develop such an extensive system. The proposed upgrade to the system accounts for changes in the environment that have taken place over the past 30 years since the installation of most of the backbone system.

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2.6 OVERVIEW: UPGRADE OF THE EMERGENCY RADIO SYSTEM

The advantages of a digital system over the existing analog system are numerous with the following attributes:

- More reliable
- Higher accuracy
- Faster speeds
- Higher frequency
- Higher capacity in a given bandwidth (more channels)
- Less maintenance required
- No Error Rate correction needed, a digital system is self-correcting
- More secure - can be encrypted
- Smaller component size
- Less noise, cleaner signals
- Less power consumption per capacity
- More stable voltage consumption
- Digital radios provide seamless interconnectivity to an expanding digital world (computers, data systems)

2.6.1 Overall Project Description

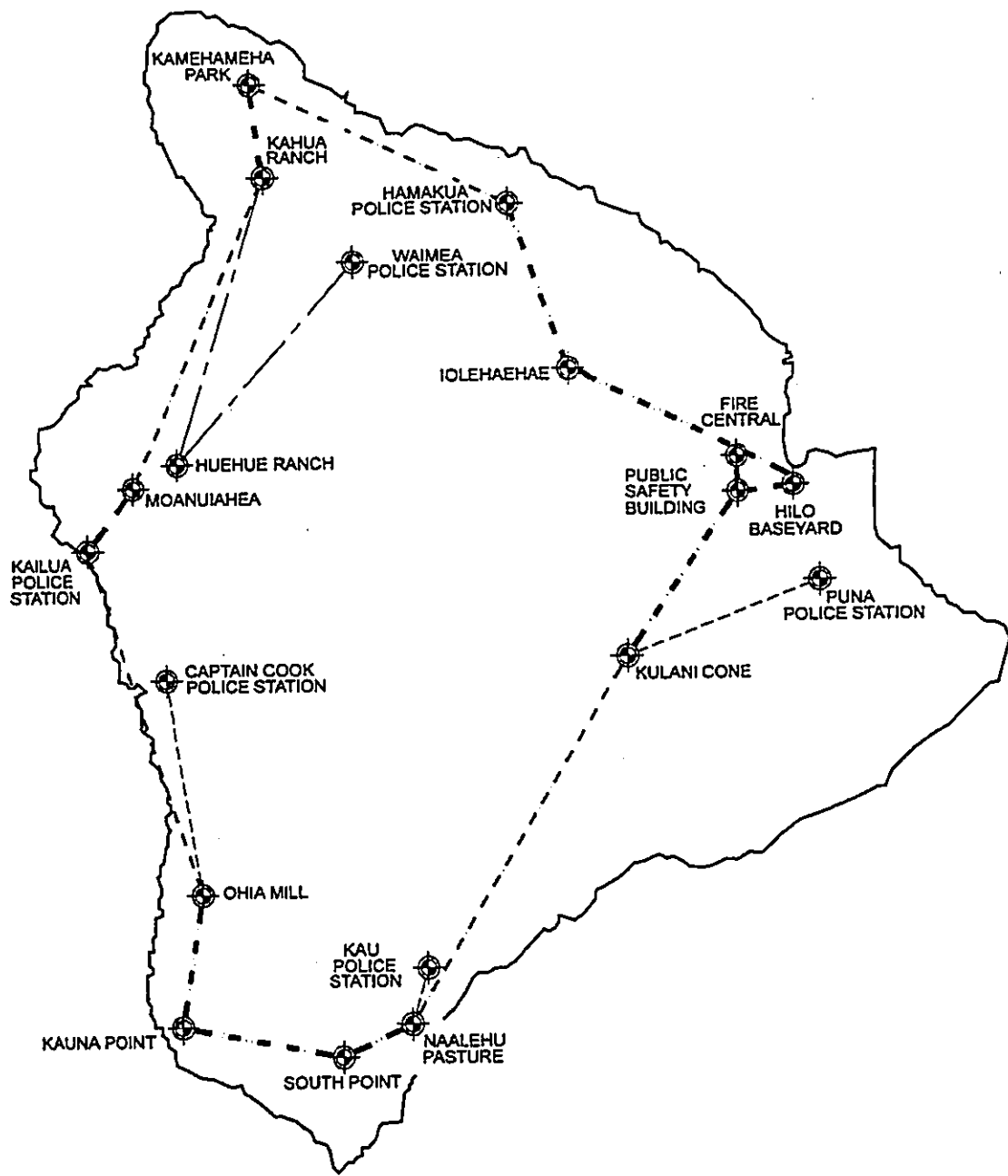
The looped system is comprised of facilities at 19 locations that provide the "backbone" of the emergency radio system and "spur" sites (Figure 1). The facilities are at the following locations: Captain Cook Police Station, Fire Central in Hilo, Hamakua Police Station, Hilo Baseyard, Huehue Ranch, Iolehaehae, Kahua Ranch, Kailua Police Station, Kamehameha Park, Kau Police Station, Kauna Point, Kulani Cone, Moanuihaea, Naalehu Pasture, Ohia Mill, Public Safety Building in Hilo, Puna Police Station, South Point, and Waimea Police Station.

The new Kahua Ranch facility will be constructed and owned by the State Department of Accounting and General Services (DAGS) allowing the County to continue to co-locate at this site. The existing Kau State Building radio facility will be removed after the replacement facility at the recently constructed Kau Police Station is in operation.

Fourteen (14) new facilities (including State DAGS Kahua Ranch facility) will be constructed directly adjacent to the existing facilities and five (5) existing facilities are planned to be refurbished for a total of nineteen (19) island-wide locations. Generally, the upgrades will include new shelters to house digital radio and appurtenant equipment, increased tower height where necessary for maximum signal strength, and backup generators and fuel tanks.

2.6.2 Loop System: Summary Description

A "backbone network" is a sequence of transmission facilities (sites) designed to interconnect other sites and networks, channels, or clusters of dispersed terminals or devices. In the case of the County of Hawaii system, the backbone network can be considered the same as the "loop"



LEGEND

- - - - - CONSTITUTION 155
6.2 GHz, 9DSS, NP
- - - - - CONSTITUTION 155
6.2 GHz, 9DSS, NP
TXS/SD RXS
- - - - - CONSTITUTION 6
6.7 GHz, 28TI, MHS
- - - - - CONSTITUTION 6
6.7 GHz, 28TI, MHS/SD

FIGURE 1
Master Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



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and also the same as all the sites. All the sites receive and transmit data from the "users" on the system and carry the data (voice traffic, etc) on the microwave "backbone" to the next site or termination point for that data.

A "spur" is a radio site that is at the end of a link. An example would be the Captain Cook site. It's only microwave transmissions are to and from the Ohia Mill site. It does not transmit to or receive from any other site.

In digital radio transmission, a "repeater" is equipment that receives a signal (microwave frequency), and then reconstructs the signal for retransmission on to the next station. In the County's system, the repeater stations are those that reside in the loop. An example is the Ohia Mill site. Its microwave transmissions are to/from Kauna Point (another repeater), Kailua Police Station (another repeater), and Captain Cook (a spur).

The system operates in a loop and requires line-of-site connecting each microwave antenna. A path survey was conducted to determine the required height of each tower using a 99.999% reliability standard. The inter-connections of the 19 facilities are shown in the System Path Maps (Figures 2A, 2B, and 2C).

Each tower will have one or more parabolic antennas that will receive and transmit signals from one tower to another. The towers will also contain whip antennas to transmit to portable two-way radios carried by police, firefighters, and other agencies.

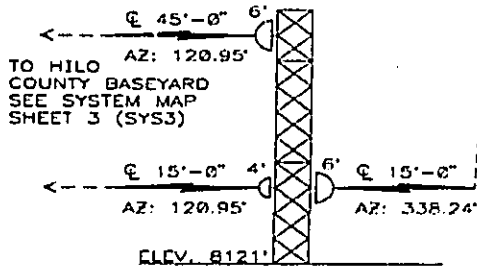
The proposed digital upgrade of the system will replace the existing analog radio system. It is designed for Harris Microwave Constellation 155-6 3DS3 digital radio configured in a 13 path ring around the Island of Hawaii, with 6 spur paths of Constellation 6 28T1. Eight of the longer paths will use space-diversity propagation protection; the shorter spur paths will use Monitored Hot-Standby equipment protection. Loop-protection will be provided for the ring paths.

How does the loop system work? Normal transmission routes the signals in a counter-clockwise direction. For example, a 911 call is received at the Dispatch Center at the Public Safety Building in Hilo (headquarters of the Hawaii Police Department) for an emergency in Captain Cook in the South Kona district. The Dispatch Center sends the signal which travels through Fire Central, Iolehaehae, Hamakua Police Station, Kamehameha Park, Kahua Ranch, Moanuahea, Kailua Police Station, Ohia Mill and on to Captain Cook where the signal "drops" and is transferred to a "whip" or omni-directional antenna which transmits to radios in police squad cars.

As a loop system, the design allows continued use if one site is not operational. In this same 911 scenario, if a problem is encountered at any site along the counterclockwise route, the system will recognize the problem and loop back for continued communication except in the problem area.

A summary of each facility, its location, elevation, height and its connecting paths or links within the loop is listed in Table 2.

ADD ON CARRIERS						
CARRIER	TYPE	NO.	SIZE	STATUS	ELN	STATUS
DMR	CITY	1	23 FT.	UNRECORDED	UNRECORDED	PEND.
FM	MOBILE	2	UNRECORDED	UNRECORDED	UNRECORDED	APPROV.
LMR	MOBILE	3	UNRECORDED	UNRECORDED	UNRECORDED	APPROV.



IOLEHAEHAE
CALL SIGN: WNEV 465

SITE ADDRESS:
IOLEHAEHAE CONE
13 MI. SW. OF
LAUPAHOEHUE, HI

GPS COORDINATES
• LATITUDE: N 19° 53' 19.8"
• LONGITUDE: W 155° 22' 56.7"

ANTENNAS: (ANDREW CORP.)

- TO HILO BASEYARD
PRIMARY: PAR6 59
DIVERSITY: PL4-59
- TO HAMAKUA
PRIMARY: PAR6-59
- RELOCATE 5 EXISTING
LMR ANTENNAS TO
NEW TOWER

SHELTER:

- NEW 10'x18' TWO ROOM
SHELTER

TOWER: (SABRE COM.)

- NEW 50' SELF SUPP. TOWER
MODFI: S3T-1
- REMOVE EXISTING 40' TOWER

GENERATOR:

- NEW KOHLER MODEL NO. 8.5RMY
LP GENERATOR
(INSIDE SHELTER)

PROPANE BOTTLES:

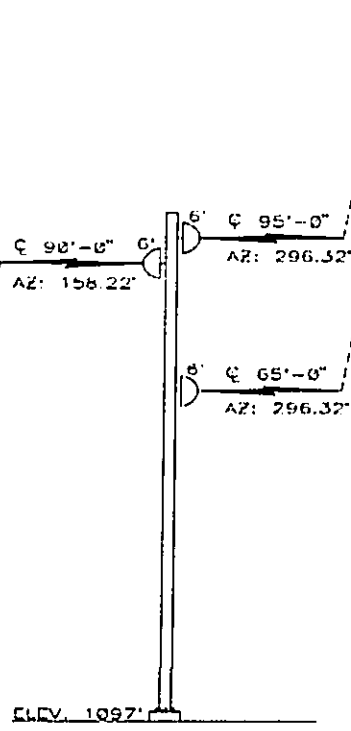
- LOCAL UTILITY RENTAL SERVICE

FENCE:

- NEW 8' CHAINLINK FENCE
W/BARBED WIRE

POWER:

- INSTALL NEW SOLAR
POWER SYSTEM



HAMAKUA PS
CALL SIGN: WNEV 466

SITE ADDRESS:
HAMAKUA POLICE STATION
HWY 240
HONOKAA, HI

GPS COORDINATES
• LATITUDE: N 20° 04' 39"
• LONGITUDE: W 155° 27' 43.6"

ANTENNAS: (ANDREW CORP.)

- TO KAM PARK
PRIMARY: PAR6 59
DIVERSITY: PL6-59
- TO IOI FAFHAF
PRIMARY: PAR6-59
- NO LMR ANTENNAS
(4 CIRCUITS ONLY)

SHELTER:

- NEW 10'x18' TWO ROOM
SHELTER

TOWER: (SABRE COM.)

- NEW 100' MONOPOLE
- REMOVE EXISTING
80' MONOPOLE

GENERATOR:

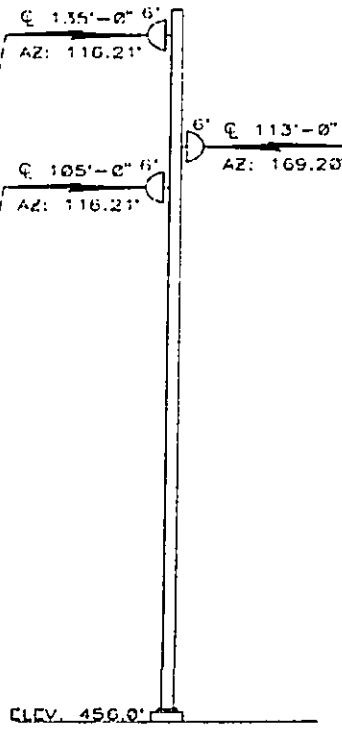
- NEW KOHLER MODEL NO. 11RMY
LP GENERATOR
(INSIDE SHELTER)

PROPANE TANK:

- LOCAL UTILITY RENTAL SERVICE

FENCE:

- NEW 8' CHAINLINK FENCE
W/BARBED WIRE



KAM PARK
CALL SIGN: WNEV 467

SITE ADDRESS:
KAMEHAMEHA PARK
KAPAAU, HI

GPS COORDINATES
• LATITUDE: N 20° 14' 05.6"
• LONGITUDE: W 155° 47' 59.4"

ANTENNAS: (ANDREW CORP.)

- TO HAMAKUA
PRIMARY: PAR6 59
DIVERSITY: PL6-59
- TO KAHUA RANCH
PRIMARY: PAR6-59
- NO LMR ANTENNAS
(2 CIRCUITS ONLY)

SHELTER:

- NEW 10'x12' TWO ROOM
SHELTER
- REMOVE EXISTING SHELTER

TOWER: (SABRE COM.)

- NEW 140' MONOPOLE
- REMOVE EXISTING
110' MONOPOLE

GENERATOR:

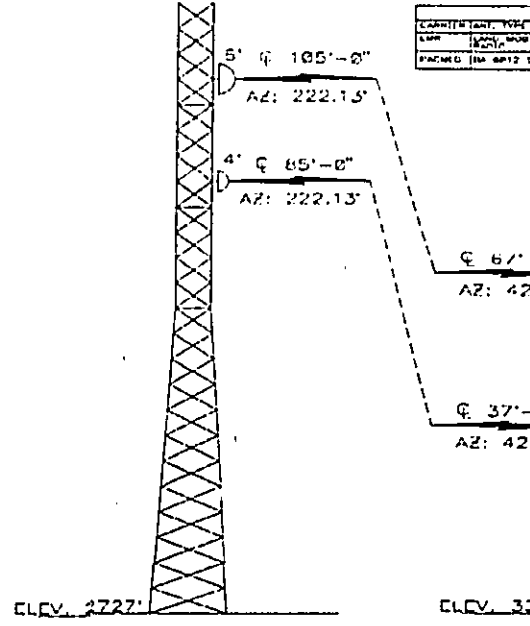
- NEW KOHLER MODEL NO. 11RMY
LP GENERATOR
(INSIDE SHELTER)

PROPANE TANK:

- LOCAL UTILITY RENTAL SERVICE

FENCE:

- NEW 10' CHAINLINK FENCE
WITHOUT BARBED WIRE



WAIMEA P.S.
CALL SIGN: WBM 604

SITE ADDRESS:
WAIMEA POLICE STATION
KAMUELA, HI
HAWAII COUNTY

GPS COORDINATES
• LATITUDE: N 20° 01' 26.7"
• LONGITUDE: W 155° 39' 42.5"

ANTENNAS: (ANDREW CORP.)

- TO HUEHUE
PRIMARY: PAR6-65
DIVERSITY: PL4-65
- NO LMR ANTENNAS
(4 CIRCUITS ONLY)

SHELTER:

- NEW TELCC SERVICES
MODEL NO. 6540HM
OUTDOOR RADIO ENCLOSURE

TOWER:

- EXISTING 120' SELF
SUPP. TOWER
- REMOVE EXISTING 40'
TOWER ONLY (FOUNDATION
TO REMAIN)

GENERATOR:

- CONNECT TO EXISTING
GENERATOR INSIDE
POLICE STATION

FENCE:

- NEW 8' CHAINLINK FENCE
W/BARBED WIRE

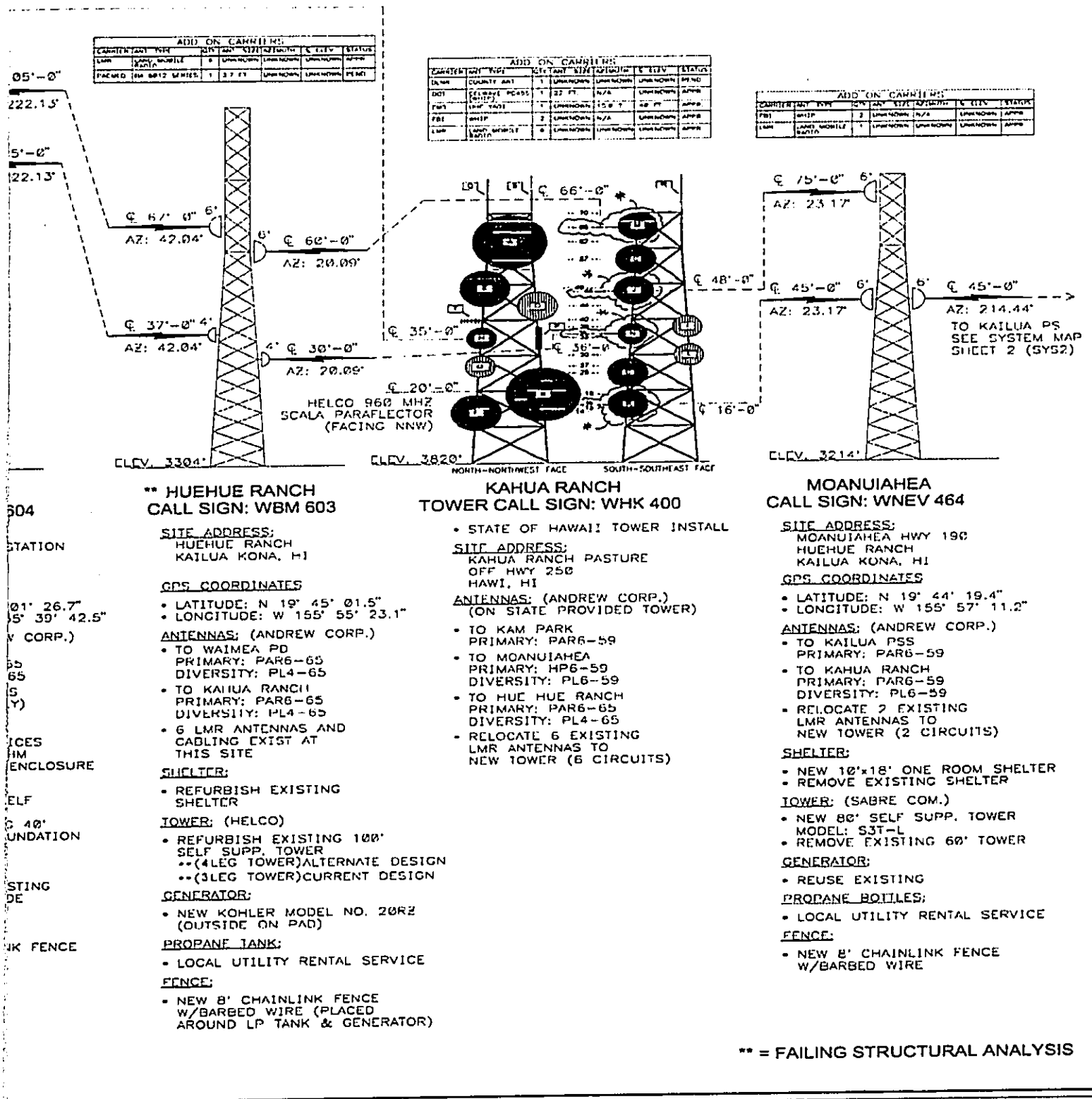
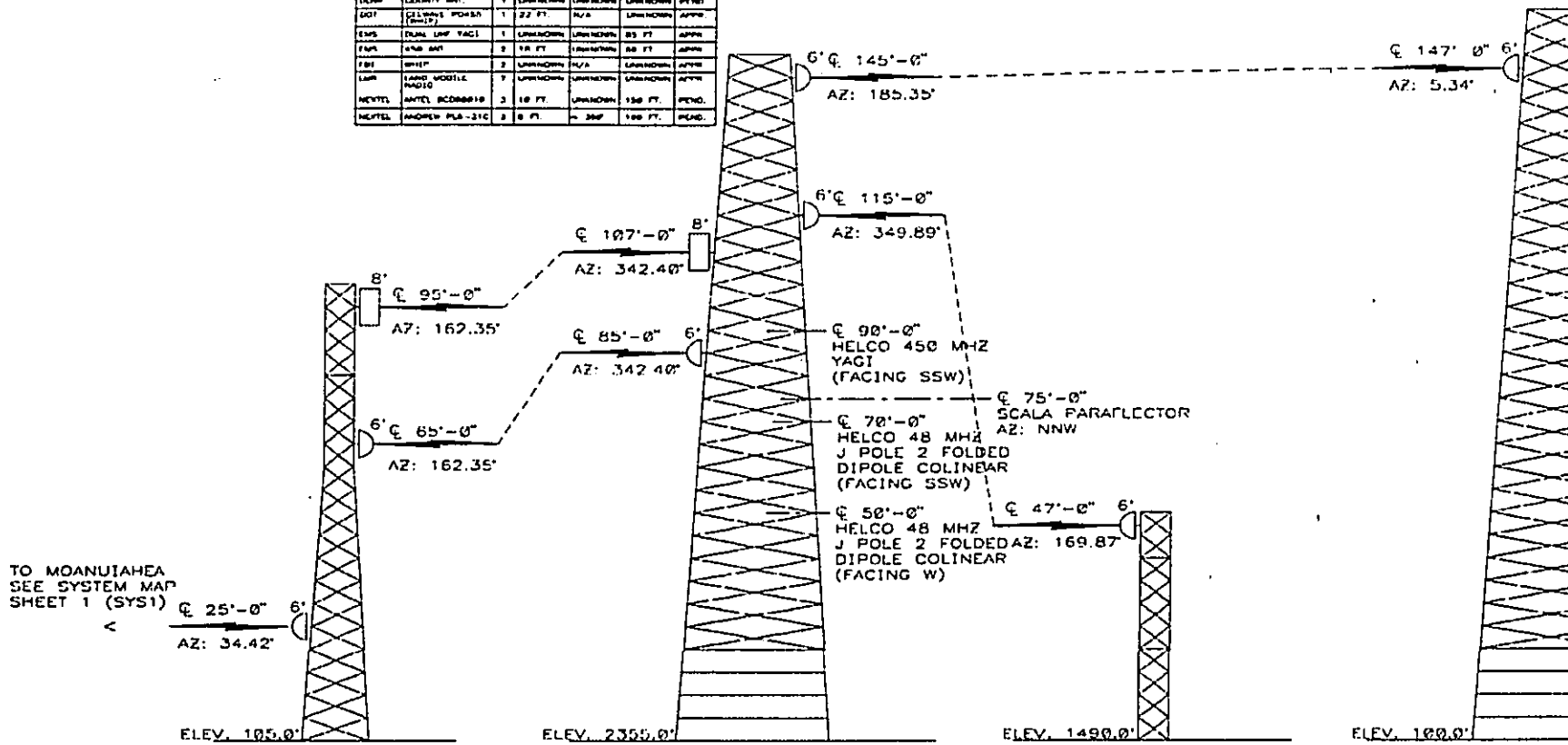


FIGURE 2A
System Map / Iolehaehae - Moanuaiea
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

ADD ON CARRIERS						
TYPE	ANT. TYPE	HT	ANT. SIZE	ORIENT	E. LVL.	STATUS
DLMP	COORNY ANT	1	12 FT.	N/A	UNKNOWN	PEND.
DOT	CELLS POKA (TWIN)	1	22 FT.	N/A	UNKNOWN	APPR.
EMS	DLMP LMP YAGI	1	UNKNOWN	UNKNOWN	85 FT.	APPR.
FUN	STB ANT	2	12 FT.	UNKNOWN	88 FT.	APPR.
FBI	STB ANT	2	UNKNOWN	N/A	UNKNOWN	APPR.
LMR	STB ANT	2	UNKNOWN	UNKNOWN	UNKNOWN	APPR.
NETEL	ANTENNA PLG-21C	3	10 FT.	UNKNOWN	150 FT.	PEND.
NETEL	ANTENNA PLG-21C	3	8 FT.	200	150 FT.	PEND.



KAILUA P.S.
CALL SIGN: WBM 602

SITE ADDRESS:
KAILUA KONA POLICE STATION
74-5221 QUEEN KAAHUMANU HIGHWAY
KAILUA KONA, HI

CPS COORDINATES
• LATITUDE: N 19° 39' 51.6"
• LONGITUDE: W 156° 00' 25"

ANTENNAS: (ANDREW CORP.)

- TO OHIA MILL
PRIMARY: HPB-59
DIVERSITY: PL6-50
- TO MOANUIAHEA
PRIMARY: PAR6-59
- NO LMR ANTENNAS
(4 CIRCUITS ONLY)

SHELTER:
• REFURBISH EXISTING
EQUIPMENT ROOM
• REMOVE EXISTING SHELTER

TOWER: (SABRE COM.)
• NEW 100' SELF SUPP. TOWER
MODEL: S3T-L
• REMOVE EXISTING 60' TOWER

GENERATOR:
• REUSE EXISTING SITE GENERATOR

PROPANE TANK:
• REUSE EXISTING TANK

FENCE:
• NEW 8' CHAINLINK FENCE
W/BARBED WIRE

OHIA MILL
CALL SIGN: WBM 601

SITE ADDRESS:
OHIA MILL
1.4 MI. NW. OF
PAPA, HI

CPS COORDINATES
• LATITUDE: N 19° 13' 19.4"
• LONGITUDE: W 155° 51' 31.7"

ANTENNAS: (ANDREW CORP.)

- TO KAUNA POINT
PRIMARY: PAR6-59
- TO KAILUA PSS
PRIMARY: HPB-59
DIVERSITY: PL6-59
- TO KONA PS
PRIMARY: PAR6-65
- RELOCATE 7 EXISTING
LMR ANTENNAS TO
NEW TOWER (7 CIRCUITS)

SHELTER:
• NEW 10'x18' SHELTER (TWO ROOM)

TOWER: (SABRE COM.)
• NEW 150' SELF SUPP. TOWER
MODEL: S3T-L

GENERATOR:
• NEW KOHLER MODEL NO. 20RZ
(INSIDE SHELTER)

PROPANE HOJILLS:
• LOCAL UTILITY RENTAL SERVICE

FENCE:
• NEW 8' CHAINLINK FENCE
W/BARBED WIRE

KONA P.S. (CAPTAIN COOK)
CALL SIGN: WBX 326

SITE ADDRESS:
KONA POLICE DISTRICT STATION
HIGHWAY 11
CAPT. COOK, HI

CPS COORDINATES
• LATITUDE: N 19° 29' 19.7"
• LONGITUDE: W 155° 54' 32.3"

ANTENNAS: (ANDREW CORP.)

- TO OHIA MILL
PRIMARY: PAR6-65
- RELOCATE 2 EXISTING LMR
CIRCUITS & 2 DIPOLE
ANTENNAS

SHELTER:
• NEW TELCO SERVICES MODEL
NO. 6540HM OUTDOOR
RADIO ENCLOSURE

TOWER: (SABRE COM.)
• NEW 50' SELF SUPP. TOWER
MODEL: S3T-L
• REMOVE EXISTING 40' TOWER

GENERATOR:
• REUSE EXISTING
SITE GENERATOR

FENCE:
• NEW 8' CHAINLINK FENCE
W/BARBED WIRE

KAUNA P.S.
CALL SIGN: WBM 603

SITE ADDRESS:
KAIKAIKULI
S. MANUKU
PAPA, HI

CPS COORDINATES
• LATITUDE: N 19° 29' 19.7"
• LONGITUDE: W 155° 54' 32.3"

ANTENNAS: (ANDREW CORP.)

- TO OHIA MILL
PRIMARY: PAR6-65
- TO SOUTH
PRIMARY: PAR6-65
- NO LMR
CIRCUITS
NEW TOWER

SHELTER:
• REFURBISH
EQUIPMENT ROOM

TOWER: (SABRE COM.)
• NEW 100' SELF SUPP. TOWER
MODEL: S3T-L
• REMOVE EXISTING 60' TOWER

GENERATOR:
• NEW KOHLER MODEL NO. 20RZ
(INSIDE SHELTER)

PROPANE TANK:
• LOCAL UTILITY RENTAL SERVICE

FENCE:
• NEW 10' CHAINLINK FENCE
W/BARBED WIRE

POWER:
• INSTALL
POWER SERVICE

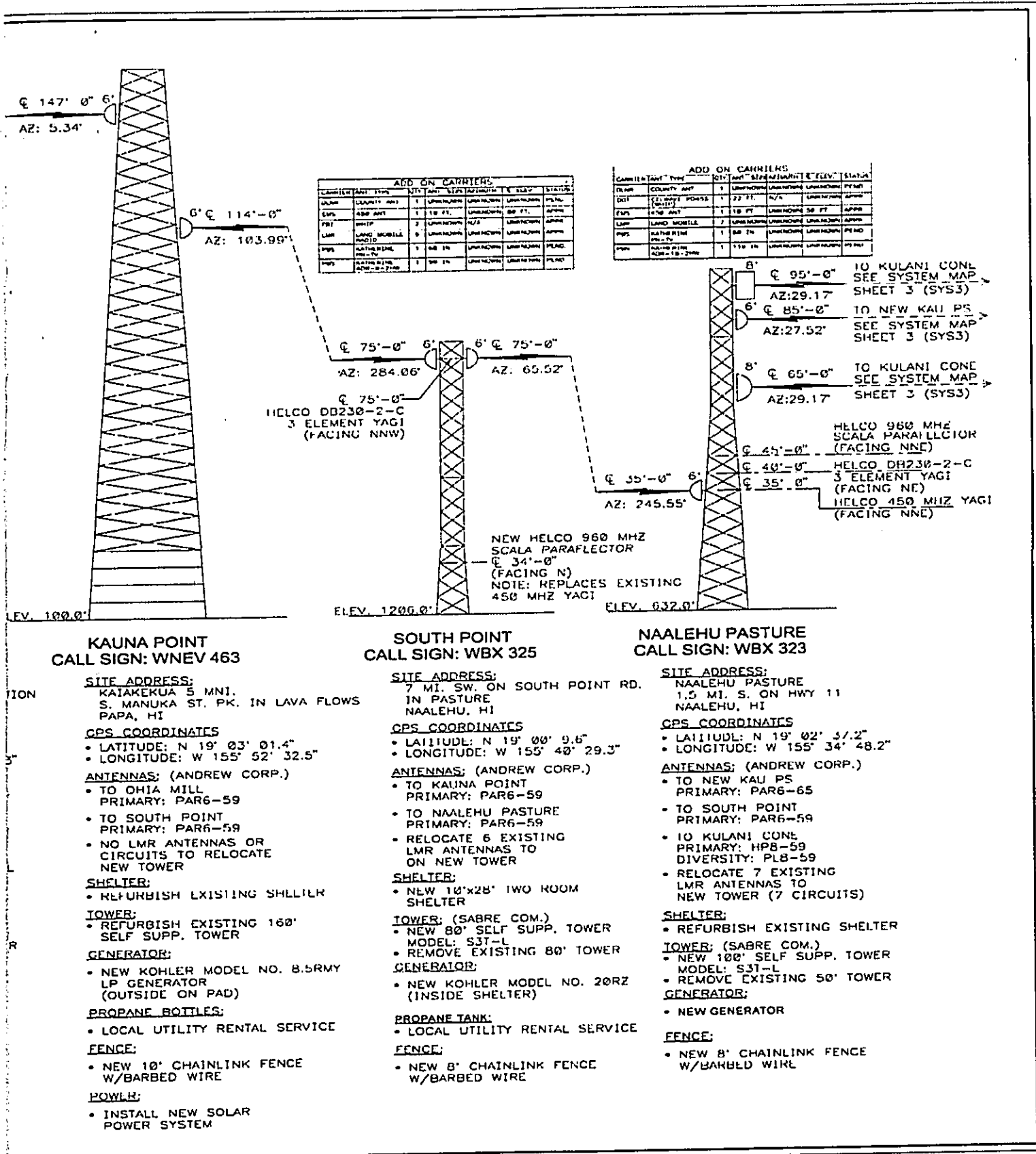
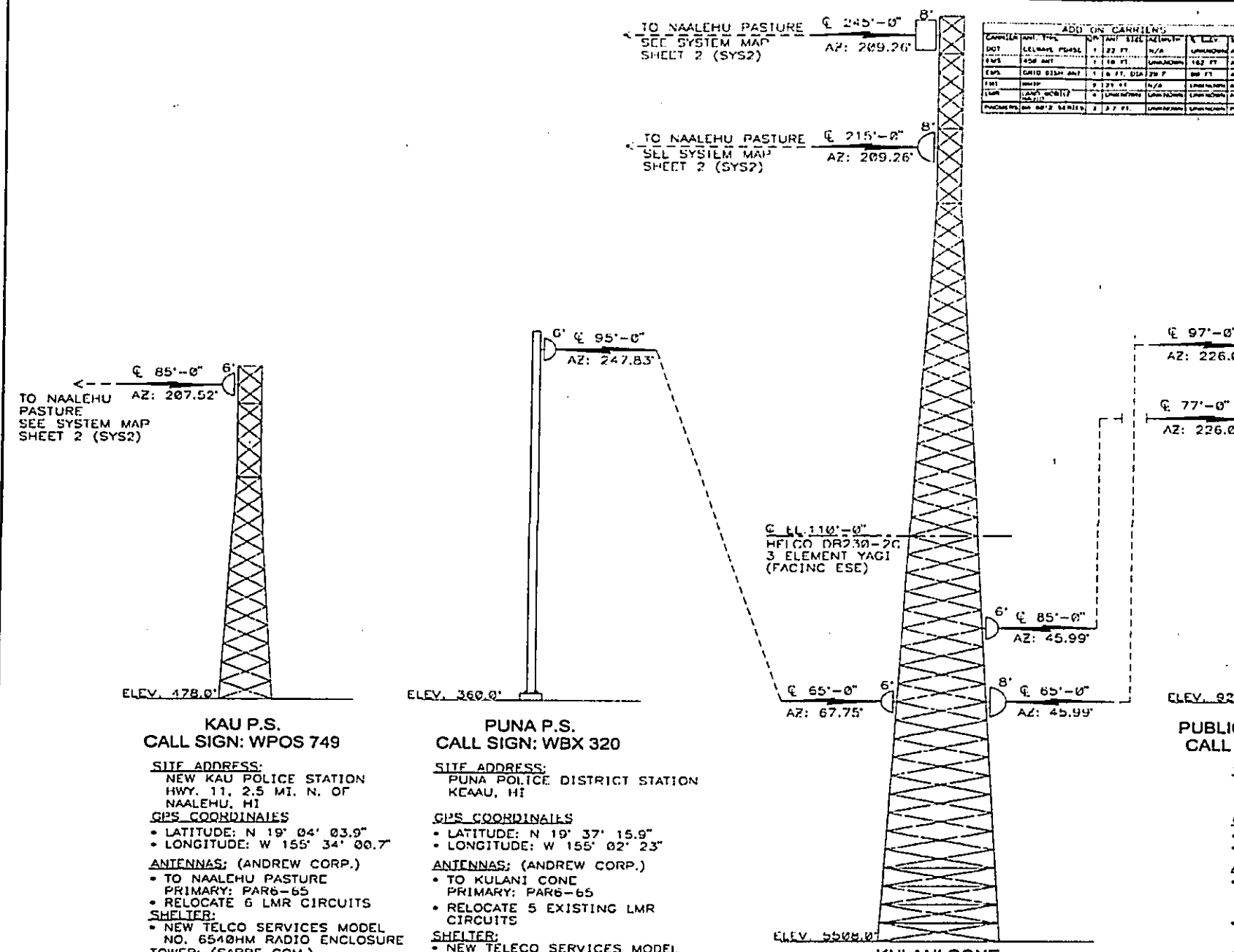


FIGURE 2B
System Map / Kailua Police Station - Naalehu Pasture

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

ADD ON CARRIERS					
CARRIER	ANT. TYPE	HT. ANT. (FT)	AZIMUTH	ELEV.	STATUS
DOT	LELWAVE P4436	1 27 FT	N/A	162 FT	ADD
EMS	428 ANT	1 110 FT			
EMS	CR10 0124 ANT	1 10 FT DIA 28 FT			
EMS	ANT	1 124 FT			
EMS	ANT	1 110 FT DIA 28 FT			
EMS	ANT	1 110 FT DIA 28 FT			
EMS	ANT	1 110 FT DIA 28 FT			
EMS	ANT	1 110 FT DIA 28 FT			



**KAU P.S.
CALL SIGN: WPOS 749**

- SITE ADDRESS:
 NEW KAU POLICE STATION
 HWY. 11, 2.5 MI. N. OF
 NAALEHU, HI
- GPS COORDINATES
 • LATITUDE: N 19° 04' 03.9"
 • LONGITUDE: W 155° 34' 00.7"
- ANTENNAS: (ANDREW CORP.)
 • TO NAALEHU PASTURE
 PRIMARY: PAR6-65
 • RELOCATE 6 LMR CIRCUITS
- SHELTER:
 • NEW TELCO SERVICES MODEL
 NO. 6540HM RADIO ENCLOSURE
- TOWER: (SABRE COM.)
 • NEW 90' SELF SUPP. TOWER
 MODEL: S3T-L
- GENERATOR:
 • REUSE EXISTING SITE
 GENERATOR
- FENCE:
 • NEW 8' CHAINLINK FENCE
 W/BARBED WIRE

**PUNA P.S.
CALL SIGN: WBX 320**

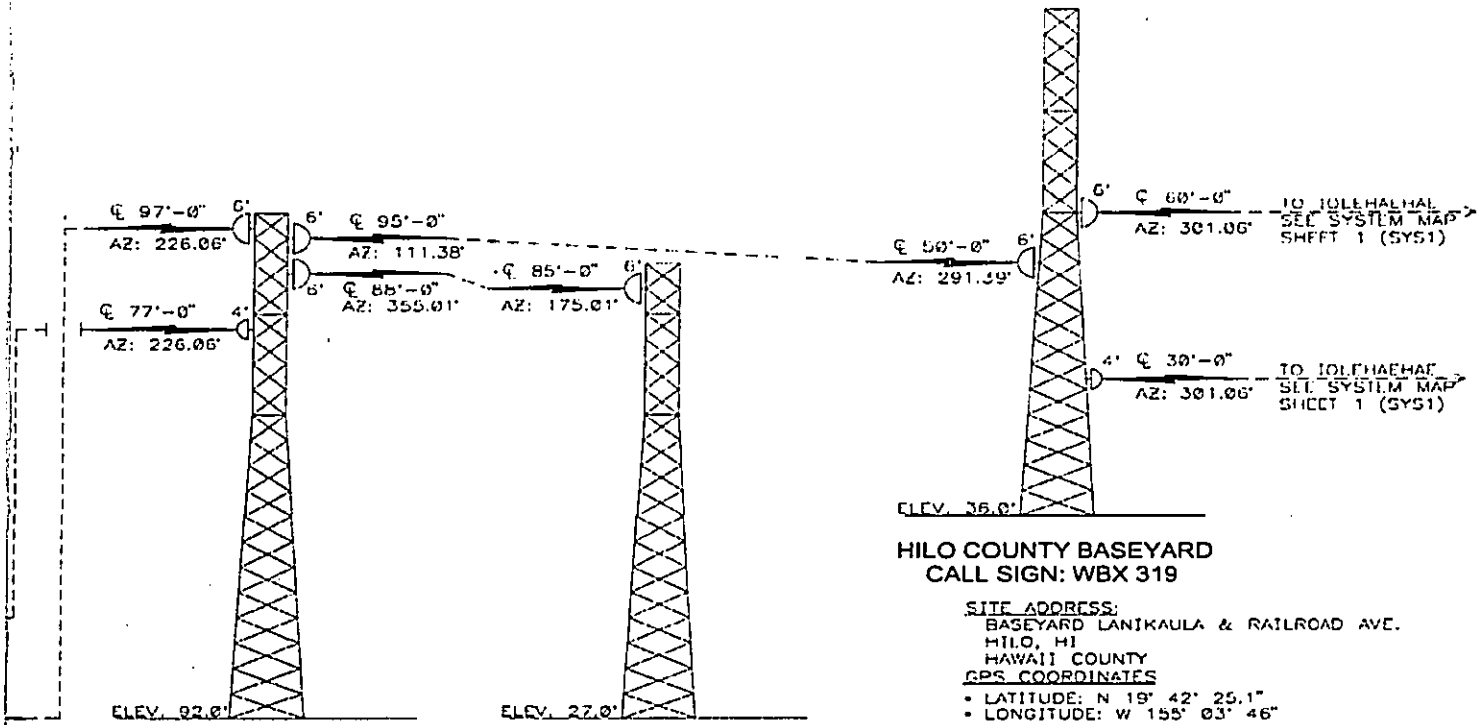
- SITE ADDRESS:
 PUNA POLICE DISTRICT STATION
 KEAAU, HI
- GPS COORDINATES
 • LATITUDE: N 19° 37' 15.9"
 • LONGITUDE: W 155° 02' 23"
- ANTENNAS: (ANDREW CORP.)
 • TO KULANI CONE
 PRIMARY: PAR6-65
 • RELOCATE 5 EXISTING LMR
 CIRCUITS
- SHELTER:
 • NEW TELCO SERVICES MODEL
 NO. 6540HM RADIO ENCLOSURE
- TOWER: (SABRE COM.)
 • NEW 100' MONOPOLE
 • REMOVE EXISTING 30' TOWER
- GENERATOR:
 • NEW KOHLER MODEL 8.5RMV
 (GENERATOR ON OUTSIDE PAD)
- PROPANE TANK:
 • LOCAL UTILITY RENTAL SERVICE
- FENCE:
 • NEW 8' CHAINLINK FENCE
 W/BARBED WIRE

**KULANI CONE
CALL SIGN: WBX 322**

- SITE ADDRESS:
 STAINBACK HIGHWAY
 HILO, HI
 KAUAI COUNTY
- ANTENNAS: (ANDREW CORP.)
 • TO PSB
 PRIMARY: PAR8-59
 DIVERSITY: PL6-59
 • TO PUNA PS
 PRIMARY: PAR6-65
 • TO NAALEHU PASTURE
 PRIMARY: HP8-59
 DIVERSITY: PL8-59
 • RELOCATE 4 EXISTING
 LMR ANTENNAS TO
 NEW TOWER(3 CIRCUITS)
- GPS COORDINATES
 • LATITUDE: N 19° 31' 14.4"
 • LONGITUDE: W 155° 17' 57"
- SHELTER:
 • NEW 10'x24' TWO ROOM
 SHELTER
- TOWER: (SABRE COM.)
 • NEW 250' SELF SUPP. TOWER
 MODEL: S3T-L
- GENERATOR:
 • NEW KOHLER MODEL NO.
 20RZ (GENERATOR INSIDE SHELTER)
- PROPANE BOTTLES:
 • LOCAL UTILITY RENTAL SERVICE
- FENCE:
 • NEW 8' CHAINLINK FENCE
 W/BARBED WIRE

CARRIERS			
ANT. HGT.	AZIMUTH	ELEV.	STATUS
22 FT.	N/A	UNKNOW	APPR
18 FT.	UNKNOW	182 FT.	APPR
6 FT. DIA.	28 F.	80 FT.	APPR
21 FT.	N/A	UNKNOW	APPR
UNKNOW	UNKNOW	UNKNOW	2993
2.2 FT.	UNKNOW	UNKNOW	PLND

ADD. ON CARRIERS			
ANT. HGT.	AZIMUTH	ELEV.	STATUS
22 FT.	N/A	UNKNOW	APPR
18 FT.	UNKNOW	182 FT.	APPR
6 FT. DIA.	28 F.	80 FT.	APPR
21 FT.	N/A	UNKNOW	APPR
UNKNOW	UNKNOW	UNKNOW	2993
2.2 FT.	UNKNOW	UNKNOW	PLND



**PUBLIC SAFETY BLDG.
CALL SIGN: WBX 321**

- SITE ADDRESS:**
349 KAPIOLANI ST.
HILO, HI 96720
HAWAII COUNTY
- GPS COORDINATES**
- LATITUDE: N 19° 42' 56.1"
 - LONGITUDE: W 155° 05' 09.6"
- ANTENNAS: (ANDREW CORP.)**
- TO KULANI CONE
PRIMARY: PAR6-59
DIVERSITY: PL4-59
 - TO HILO BASEYARD
PRIMARY: PAR6-59
 - TO FIRE CENTRAL
PRIMARY: PAR6-65
 - RELOCATE 18 EXISTING LMR CIRCUITS TO NEW TOWER
- SHELTER:**
- REFURBISH EXISTING RADIO ROOM
- TOWER:**
- INSTALL ON EXISTING 100' SELF SUPP. TOWER
- GENERATOR:**
- REUSE EXISTING SITE GENERATOR

**FIRE CENTRAL
CALL SIGN: WHK 398**

- SITE ADDRESS:**
466 KINOOLE ST.
HILO, HI
HAWAII COUNTY
- GPS COORDINATES**
- LATITUDE: N 19° 43' 11.3"
 - LONGITUDE: W 155° 05' 11"
- ANTENNAS: (ANDREW CORP.)**
- TO PSB
PRIMARY: PAR6-65
 - RELOCATE 16 EXISTING LMR CIRCUITS AND 4 WHIPS TO NEW TOWER
- SHELTER:**
- NEW 10'x12' SHELTER (SINGLE ROOM)
- TOWER: (SABRE COM.)**
- NEW 90' SELF SUPP. TOWER
MODEL: S3T-L
- GENERATOR:**
- NEW GENERATOR
- PROPANE TANK:**
- NEW TANK
- FENCE:**
- NEW 8' CHAINLINK FENCE W/BARBED WIRE

**HILO COUNTY BASEYARD
CALL SIGN: WBX 319**

- SITE ADDRESS:**
BASEYARD LANIKAULA & RAILROAD AVE.
HILO, HI
HAWAII COUNTY
- GPS COORDINATES**
- LATITUDE: N 19° 42' 25.1"
 - LONGITUDE: W 155° 03' 46"
- ANTENNAS: (ANDREW CORP.)**
- TO IOLLEHAHAH
PRIMARY: PAR6-59
DIVERSITY: PL4-59
 - TO PSB
PRIMARY: PAR6-59
 - RELOCATE 3 EXISTING LMR ANTENNAS AND 3 CIRCUITS TO NEW TOWER
- SHELTER:**
- REFURBISH EXISTING SHELTER
- TOWER:**
- EXISTING 100' SELF SUPP. TOWER
- GENERATOR:**
- REPLACE EXISTING WITH NEW KOHLER MODEL NO. 11RMY (INSIDE EXISTING SHELTER)
- PROPANE TANK:**
- REUSE EXISTING PROPANE TANK
- FENCE:**
- NEW 8' CHAINLINK FENCE W/BARBED WIRE

ES
9' 31' 14.4"
155° 17' 57"

WO ROOM

COM.)
F SUPP. TOWER

MODEL NO.
TOR INSIDE SHELTER)

ES:
RENTAL SERVICE

LINK FENCE
RE

FIGURE 2C
System Map / Kau Police Station - Hilo Baseyard

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

Table 2. Facility Listing by Geographic Paths

Site	Location /District	Site Elevation	Existing Tower Height	Install Tower Height	Backbone /Spur	Paths to/from
Iolehaehae	Slope of Mauna Kea / North Hilo	8,121 ft	40 ft (mp)*	50 ft (ss)**	Backbone	-Hamakua Police Station -County Baseyard
Hamakua Police Station	Honokaa / Hamakua	1,097 ft	80 ft (mp)	100 ft (mp)	Backbone	-Iolehaehae -Kamehameha Park
Kamehameha Park	Kapaau / North Kohala	456 ft	110 ft (mp)	140 ft (mp)	Backbone	-Kahua Ranch -Hamakua Police Station
Waimea Police Station	Waimea / South Kohala	2,727 ft	120 ft (ss)	120 ft (Refurbish)	Spur	-Huehue Ranch
Huehue Ranch	Kaupulehu / North Kona	3,304 ft	100 ft (ss)	100 ft (Refurbish)	Backbone	-Waimea Police Station -Kahua Ranch
Kahua Ranch (Construction by State DAGS)	Kahua Ranch / North Kohala	3,820 ft	40 ft (guy)	70 ft (ss)	Backbone (Spur to Huehue)	-Huehue Ranch -Kamehameha Park -Moanuihea
Moanuihea (Mauka of Makalei Golf Course)	Kaupulehu / North Kona	3,214 ft	60 ft (ss)	80 ft (ss)	Backbone	-Kailua Police Station -Kahua Ranch
Kailua Police Station	Kealakehe / North Kona	105 ft	60 ft (ss)	100 ft (ss)	Backbone	-Ohia Mill -Moanuihea
Ohia Mill	Yee Hop Ranch / South Kona	2,355 ft	100 ft (ss)	150 ft (ss)	Backbone (Spur to Captain Cook)	-Kauna Point -Kailua Police Station -Captain Cook Police Station
Captain Cook Police Station	Captain Cook / South Kona	1,490 ft	40 ft (ss)	50 ft (ss)	Spur	-Ohia Mill
Kauna Point (Kaiakua)	Manuka Natural Area Reserve / Kau	100 ft	160 ft (ss)	160 ft (Refurbish)	Backbone	-South Point -Ohia Mill
South Point	South Point / Kau	1,206 ft	80 ft (ss)	80 ft (ss)	Backbone	-Naalehu Pasture -Kauna Point
Naalehu Pasture	Naalehu / Kau	632 ft	50 ft (ss)	100 ft (ss)	Backbone (Spur to Kau Police Station)	-Kau Police Station -Kulani Cone -South Point
Kau Police Station	Naalehu / Kau	478 ft	N/A	90 ft (ss)	Spur	-Naalehu Pasture
Kau State Building (Demolish Only)	Naalehu Civic Center / Kau	213.4 m	45 ft (ss)	(Demolish)	N/A	N/A
Puna Police Station	Keaau / Puna	36 ft	30 ft (ss)	100 ft (mp)	Spur	-Kulani Cone
Kulani Cone	Above Kulani Correctional Facility / Kau	5,508 ft	180 ft (guy)	250 ft (ss)	Backbone (Spur to Puna Police Station)	-Naalehu Pasture -Puna Police Station -Public Safety Building
Public Safety Building	Hilo / South Hilo	92 ft	100 ft (ss)	100 ft (Refurbish)	Backbone	-County Baseyard -Kulani Cone -Fire Central
Fire Central	Hilo / South Hilo	27 ft	30 ft (roof/guy)	90 ft (ss)	Spur	-Public Safety Building
County Baseyard	Hilo / South Hilo	36 ft	100 ft (ss)	100 ft (Refurbish)	Backbone	-Public Safety Building -Iolehaehae

* Monopole tower

** Self-supporting tower

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
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All of the sites are existing radio sites with the exception of the Kau Police Station, which was constructed in 1997. New radio facilities at the Kau Police Station will be built to replace the current facilities at the Kau State Building. The existing and new systems at the Kau Police Station will operate in parallel for a period of time to assure that there will be no disruption in emergency radio services. After final acceptance of the digital system the old analog system will be removed and recycled or disposed at an approved County of Hawaii location.

2.6.3 Components of Each Facility

The components of each facility will be upgraded to include new digital microwave radio and antenna equipment and replacement (or refurbished) towers. Shelters or cabinets will house the equipment and batteries. The land area requirement is approximately 1,500 square feet and enclosed by a chain link fence. Access to each facility is via private or public roads and generally HELCO electrical power lines provide energy. Where power lines are not available, photovoltaic solar collectors and 12 volt systems supply the electrical needs. All sites are equipped with emergency standby generators and propane fuel.

2.6.3.1 Towers

The most visually apparent component of any tele-communications antenna system is the supporting tower. The design of the County system operates as a loop and requires line-of-sight to connect the paths of each microwave antenna. The towers range from 50 feet to 250 feet with a median height of 100 - 120 feet. Tower heights were determined by a path survey which recommended the increases at 13 of the 19 sites.² Growth in vegetation or change in land uses over the past 30 years account for increases in tower height since microwave transmission depends on line-of-sight.

All of the towers will be either self-supporting with the familiar lattice pattern (16 towers) or monopoles (3 towers) (Figure 3). Preliminary testing results indicate that five of the existing tower may be reused with minor refurbishing; additional tests will be undertaken prior for confirmation. None of the towers will be guy-wired. All new towers and antennas are specified to withstand windspeeds up to 110 miles per hour (mph) to meet the County requirements.

Self-Supporting Tower. Self-supporting (or lattice-type) towers have the ability to carry moderate to heavy accessory loads and are custom engineered to specified needs. The self-supporting towers are three-legged, with tubular or solid round legs, and angle bracing. They are made of high-strength steel and manufactured for easy on-site assembly. The all steel parts are hot-dip galvanized to ensure uncompromising integrity in severe climates and a factory applied finish coat is available.³

Monopole. Monopoles are single member self-supporting structures often used in urban areas where space is limited. Each steel tapered monopole is custom engineered to the specific application. The monopoles are made of high-strength steel with minimum yield strength of 65

² Harris Communications, Microwave Path Survey Report, January 2003.

³ Sabre telecommunications products.

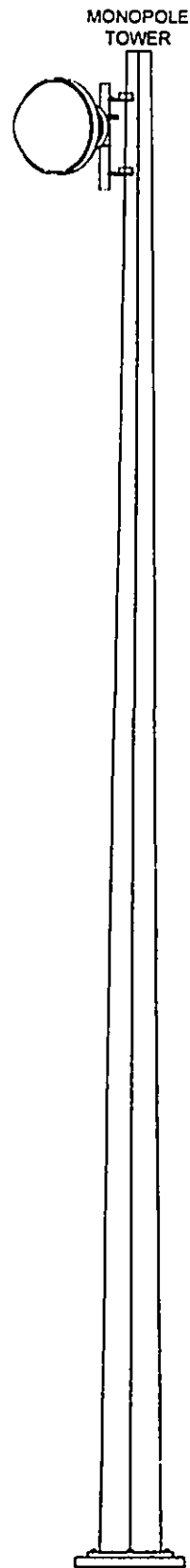
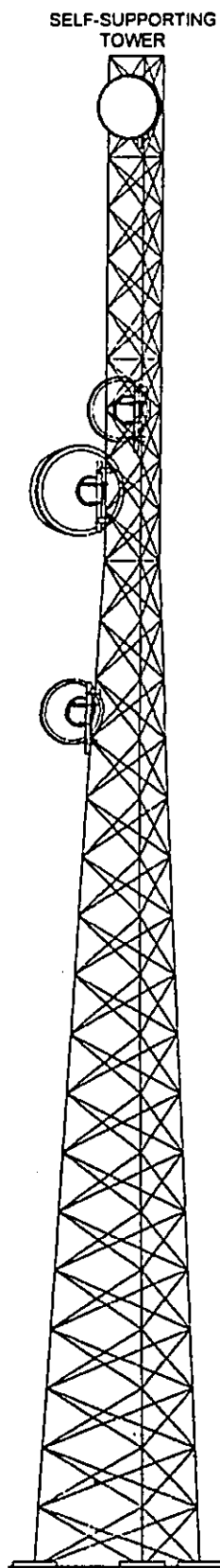


FIGURE 3
Self-Supporting and Monopole Tower (Typical)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

ksi. They are designed for easy on-site assembly and constructed to slip-fit tapered sections with steel templates to assure proper base bolt alignment. For safety, the monopoles are provided with step bolt working rings at handhole levels and tie off brackets at all working points. The all steel parts are hot-dip galvanized to ensure integrity in severe climates. A factory applied finish coat is available.⁴

2.6.3.2 Antennas

Each tower supports an antenna for each path. Typically there are two to three microwave antennas on each tower ranging in diameter from four feet to eight feet. Most of the "parabolic" antennas are six feet in diameter. A parabolic antenna is a bowl shaped reflector that "gathers" the radio frequency waves and concentrates them to the center of the antenna where the "beam" is reflected into the cable and on into the radio.

A "radome" covering, usually of fiberglass, is attached to the parabolic microwave antenna to enhance its windloading ability. In the case of a standard antenna the covering is most likely a fiberglass "cone". In the case of hi-performance antennas (they look like a base drum) the radome material could be a "teglar" fabric. These provide the most signal gain and rejection of unwanted frequencies.

Antennas which are specified for the County upgrades are PAR and PARX series Unshielded Antennas 5.725 to 6.425 GHz. PAR series single polarized antennas are well suited for low capacity systems such as cellular and PCS backhauls, while the PARX series dual polarized antennas provide medium to high capacity capabilities. Either series antennas can be used in applications such as common carrier, private networks, PCS, cellular, site interconnect, or backhaul. The additional band coverage of 5.725 to 5.85 GHz opens up the unlicensed spectrum to operators looking for bandwidth and options for growth.

These smaller diameter antennas (6 ft to 8 ft) are focal plane, deep-dish type reflectors, which allow high front to back ratios and improved pattern performance when compared to standard antennas. Antennas have spun aluminum reflectors and hot dipped galvanized vertical tower mounts.

Other types of antennas which will likely also be mounted on the towers include grid, whip, and yagi antennas.

Grid. A type of antenna that is similar to the conical shaped antennas that one sees on microwave sites, but is "open" with the metal "grids" attached to the circular frame. These antennas provide the least amount of wind resistance and tower loading (unless in ice conditions) but do not produce as much of the directional "rejection" that standard parabolic antennas provide.

⁴ Sabre telecommunications products.

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
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Whip. A single element antenna looking like a tall rod. The length is determined by the frequency used. Most whip antennas are also called “omni” as they radiate in all directions and are not “targeted” to a specific distant site.

Yagi. A type of antenna for communications that resembles a television antenna. The different sizes of the elements are determined by the specific frequency range desired. Sometimes the elements are enclosed inside a “tube-like” structure.

2.6.3.3 Radio equipment

The radio equipment for the County of Hawaii digital upgrade is the Harris Corporation Constellation 6 microwave radio in the configuration of 2 x DS3 +28 x DS1 for the loop and 28 x DS1 for the spur links. The Constellation is a scalable low, medium and high capacity digital radio. The County of Hawaii system will utilize the 2 x DS3 + 28 x DS1 with an integrated multiplexer to provide DS1 access from a selected DS3 at terminals and add-drop repeaters with no need for an external M13 multiplexer. The maintenance of the digital system is enhanced by an easy to use craft (technician) interface which allows full network visibility to the card level from a single site via a laptop or from the technician keypad provided at each site.

2.6.3.4 Equipment Shelter or Outdoor Cabinet

Generally each site will have an equipment shelter or cabinet to house the radio equipment. The equipment shelter will be a pre-fabricated building approximately 10 ft x 16 ft which will be transported to the sites. Figure 4 depicts a typical Shelter Floor Plan which will be customized to fit into each facility’s site plan. Shelters would be mobilized onto the site and bolted to a concrete slab foundation.

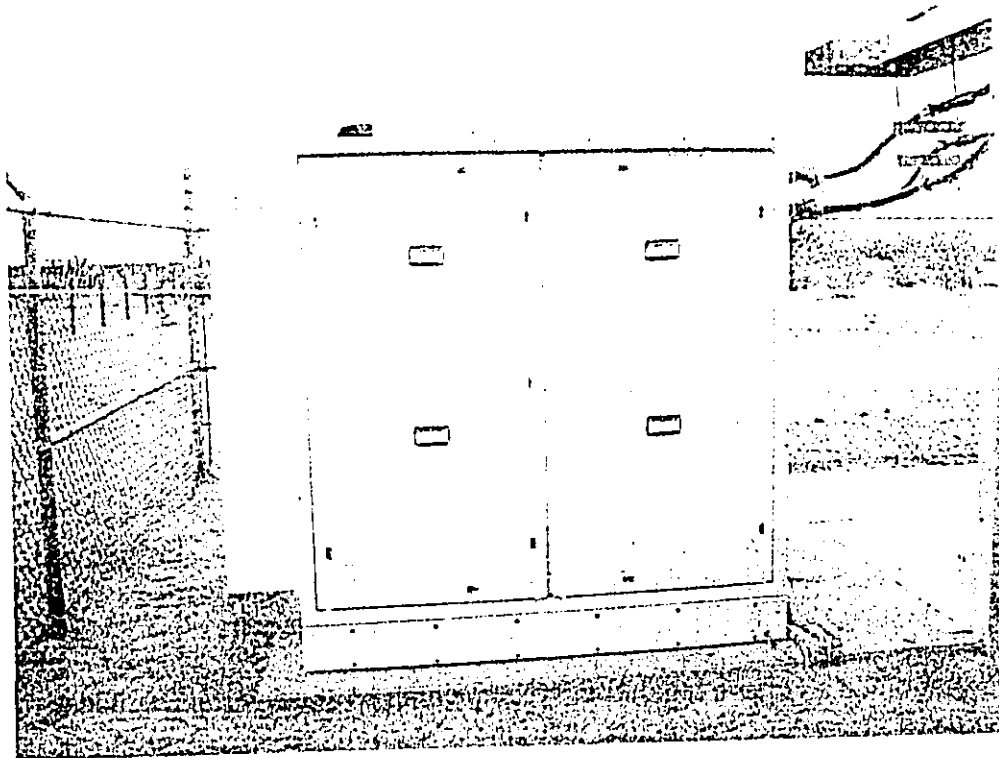
Shelters provide secure protection for the radio equipment. Fabricated with 4-inch panels of lightweight, structural reinforced concrete, making them fire, bullet, and vandal resistant resulting in an ultrasecure space to assure constant on-air service.

The weather-proof design and construction will channel water away from the building and the equipment and tested to verify the structural integrity of the structure. The shelter’s construction protects radio operations from interruptions due to gale-force winds or seismic disturbances.⁵ Proper foundation and four tie-down locations protects against damage caused by earthquakes to meet the requirements of Seismic Zone 4 classification, 49e most stringent structural standard specified for buildings located in areas subject to frequent and major seismic activity.

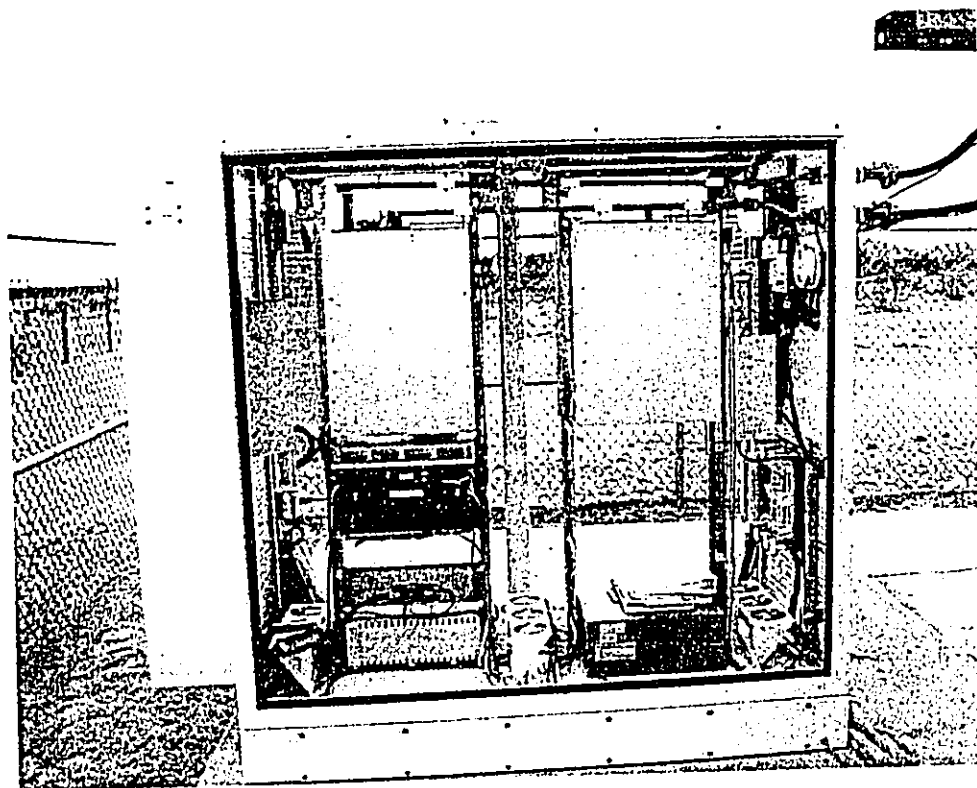
Maintenance is minimized and radio equipment is protected by the weather resistant sealed-joint construction and positive compression seals on exterior doors.

The Outdoor Cabinet is a compact flexible design that facilitates the use of telecommunications equipment with minimal footprint (Figure 5). The cabinet is a self-contained environment suitable for the new digital radios. The cabinets will contain the radio equipment and the

⁵ Andrew Equipment Shelters – www.andrew.com



REAR VIEW
(CLOSED)



REAR VIEW
(OPEN)

FIGURE 5
Equipment Cabinet (Typical)
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

necessary supporting units for the radio equipment. Included in the cabinets will be the battery back-up, air conditioning, waveguide dehydration system and power panel. The cabinets are seismic zone 4 rated for the island of Hawaii.

2.6.3.5 Wave Guide Bridge

The Wave Guide Bridge supports the horizontal runs of the wave guide as they traverse from the tower to the shelter / cabinet.

2.6.3.6 Generator / Fuel

Most of the sites will have an emergency generator with a propane tank.

Kohler Power Systems – 60 Hz generator sets are UL 2200-listed and CSA-certified and designed with a sound enclosure for quiet operation. Emission certification meets Environmental Protection Agency (EPA) nonstationary unit requirements.

Generator features include a voltage regulation system which provides instant response to load changes and a skewed generator construction that produces a smooth AC waveform.

Each facility plan includes an emergency generator and batteries in the event of electrical power outages. Above ground propane tanks will have capacity for 288 to 499 gallons of liquid propane (LP) fuel or a number of 100 lb (23.5 gallons) LP standing tanks or “bottles”.

2.6.3.7 Batteries

The batteries utilized for the County Digital Upgrade system are rack mounted Exide GNB Absolyte IIP batteries connected in a string to provide the necessary 48 volt back up power to operate the radio system in the event of commercial or photovoltaic power failure. The Absolyte IIP is a proven battery system that is qualified to stack horizontally up to eight units high for use in UBC Seismic Zone 4.

The batteries are sealed and do not require water additions or scheduled equalization charges. Periodic maintenance consists of visual inspections, voltage readings, and re-torquing the connections.

2.6.3.8 Electrical Energy

HELCO electrical power lines service all site locations except Iolehaehae and Kauna Point.

Photovoltaic systems provide the power source for the facilities at Iolehaehae and Kauna Point. The solar collector systems and batteries are backed up by a generator.

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.6.3.9 Fencing

Generally, the facilities will be fenced and locked for security purposes. Chainlink fencing will be 8 to 10 feet high and topped with barbed wire and accessed by a 12-ft double-wide gate.

2.6.4 Construction and Operation of the Project

The contractor, Scientel America, Inc., is responsible for the design, construction, and installation of the system. Pacific Wireless Communications LLC (PWC), 710 Kakoi Street, Honolulu, Hawaii and Summit Construction, Aiea, Hawaii will assist Scientel in the construction and installation of the system.

The operation of the system is designed to be self-sustaining and will not require permanent on-site staffing. Pacific Wireless Communications will oversee the maintenance of the system for two years to assure all facilities are performing properly.

2.6.5 Preliminary Cost Estimate

The funding for the new system is by the Hawaii Police Department and is estimated to be \$10.5 million. Approximately \$2.5 million (of the total \$10.5 million) is from two commercial telecommunications companies, AT&T and T-Mobile, and the remaining \$8 million is financed by County bond money.

The State Department of Accounting and General Services construction of the Kahua Ranch facility will be made available for County of Hawaii use at no cost, thus, providing a cost reduction to the County. The costs to the County at the Kahua Ranch site will include the purchase of equipment, engineering, and installation of the equipment.

2.6.6 Project Schedule

Construction of the new facilities is expected to commence in late 2003 upon receipt of County and State permits and approvals with an anticipation that the system will be in full operation by December 31, 2004.

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7 SITE SPECIFIC DESCRIPTION OF EACH RADIO FACILITY

The existing conditions and proposed improvements for each facility is described below (listed in alphabetical order) and shown in the graphic figures.

2.7.1 Captain Cook Police Station

Location/Access. Located at 82-6130 Mamalahoa Highway in the town of Captain Cook, the Police Station is within a Civic Center complex, which also includes the County Fire Station. The property is identified as tax map key (TMK) 8-2-001:084. Access to the property is from Mamalahoa Highway (Hwy 11). Figure 6A shows the site on the U.S. Geological Survey (USGS) quadrangle map. Figure 6B identifies the site on the TMK map location and 6B-1 depicts a boundary plan. Site photographs are provided in Figure 6C.

Existing System. This facility is a microwave spur site only that provides a path from Ohia Mill. The microwave radio equipment is installed within the police building; there is no separate radio shelter. The existing 40-ft tower is located approximately 100 ft from the police building, and a microwave transmission line is routed to the tower on a messenger cable.

Proposed Improvements. The upgrades will include a new tower structure directly adjacent to the police building with the following features:

- New 50 ft self supporting tower
- One (1) new parabolic antenna
- New outdoor radio equipment cabinet, batteries and charger
- New 8 ft high chain link fence (approx. 13 ft x 15 ft 6 in)
- Use existing generator and propane tank

Path. The Captain Cook site provides a spur path to/from Ohio Mill via an antenna at 47 feet above ground.

Figures 6D and 6E show the site and elevation plans, respectively.

Co-Locater. USGS Hawaii Volcanoes Observatory (HVO)

- Whip antenna

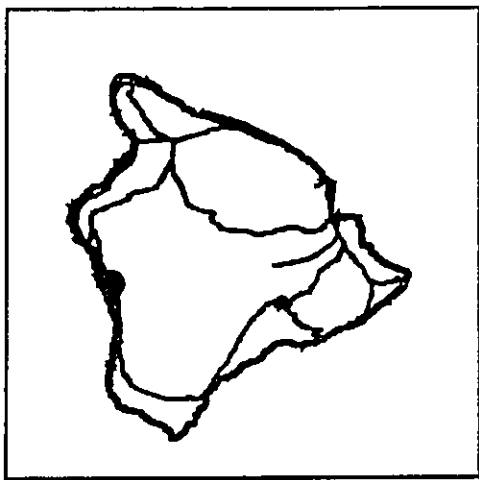
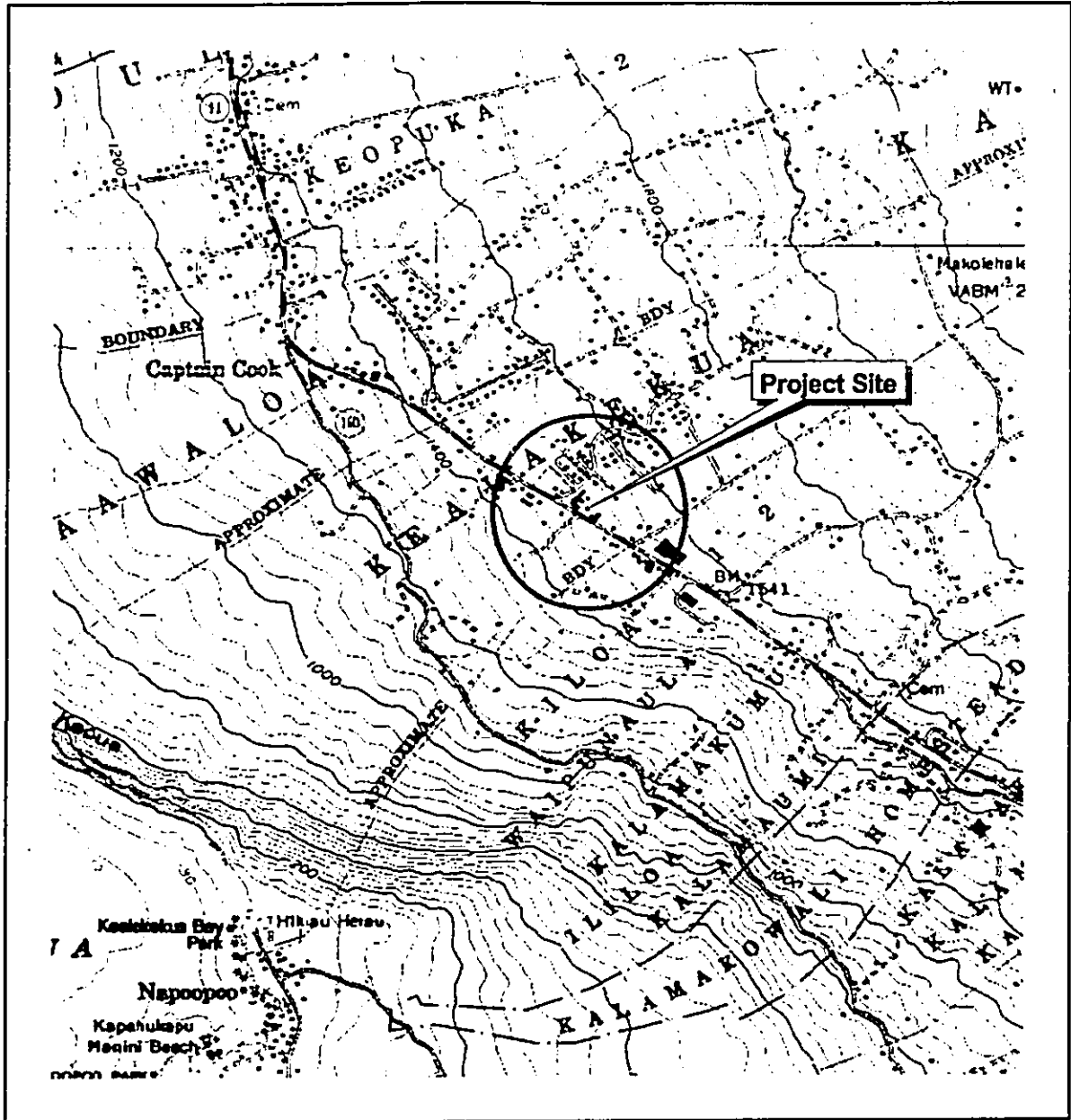
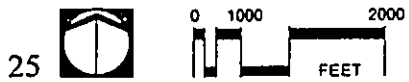
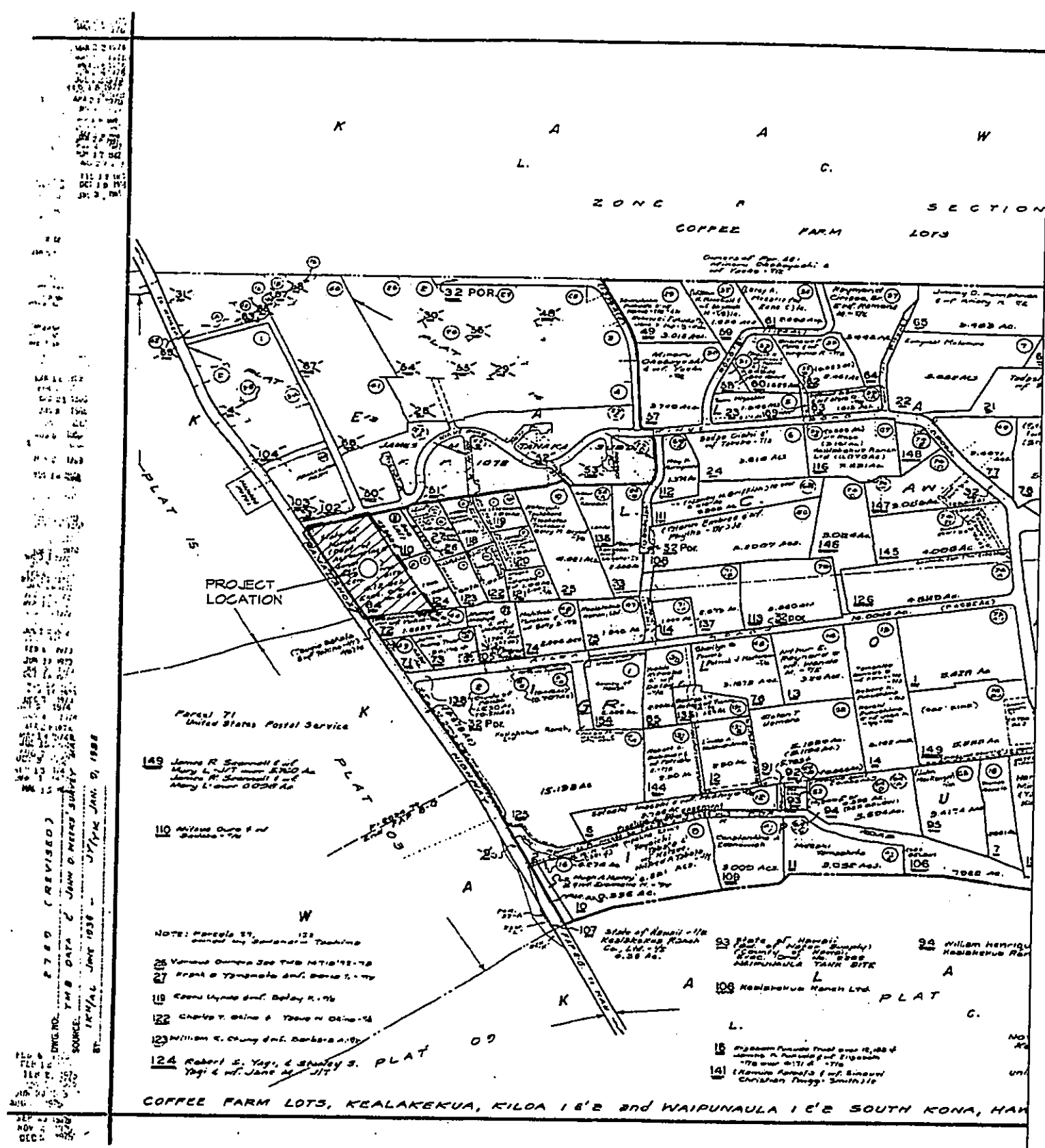


FIGURE 6A
 Captain Cook / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



Source: USGS Honaunau Quadrangle



LEGEND

= LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR

= PROJECT LOCATION

FIGURE 6B
 Captain Cook Police Station / TMK: 8-2-01:84
 COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



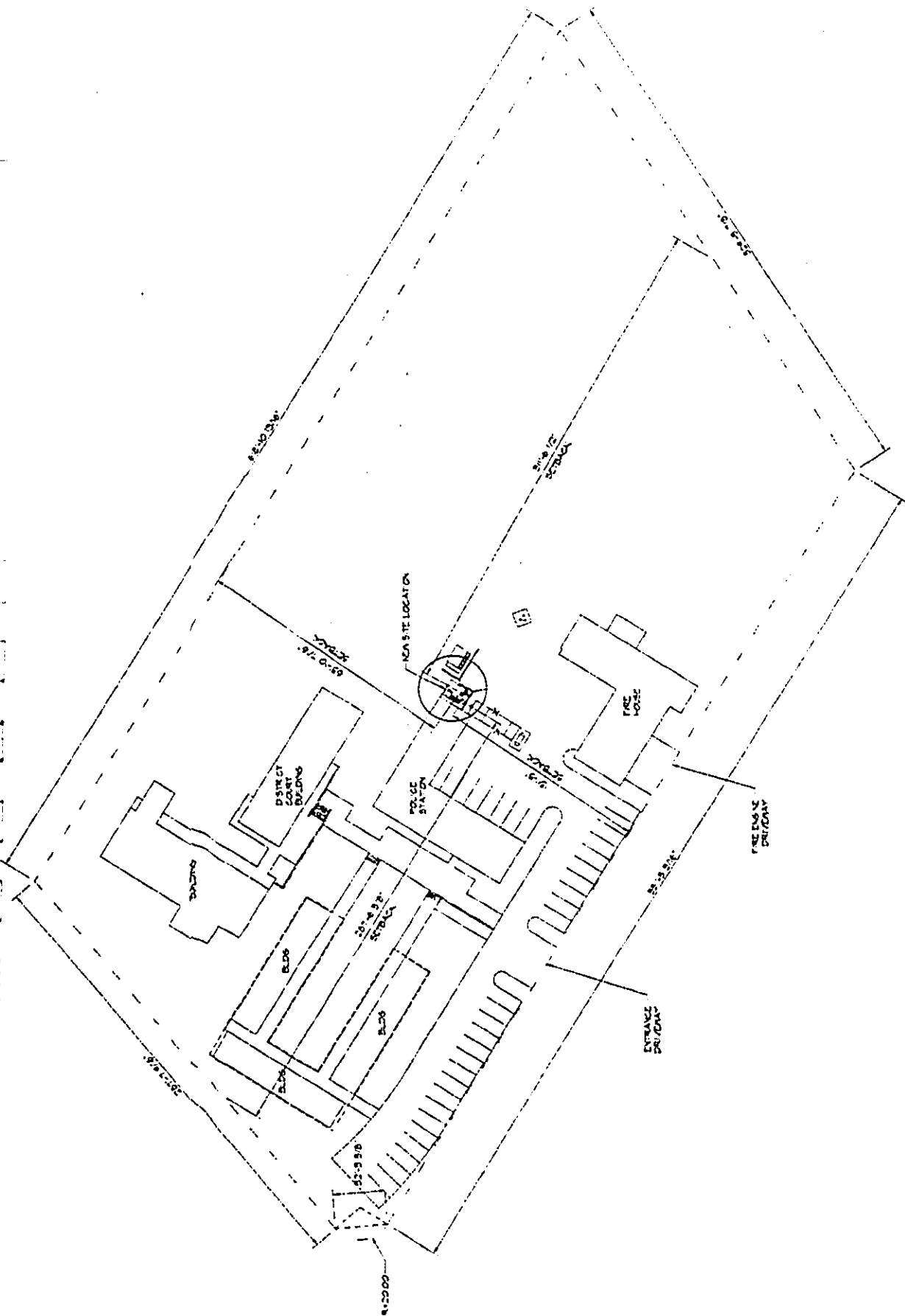
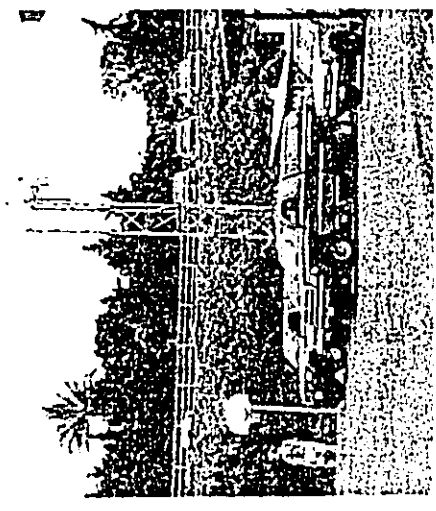
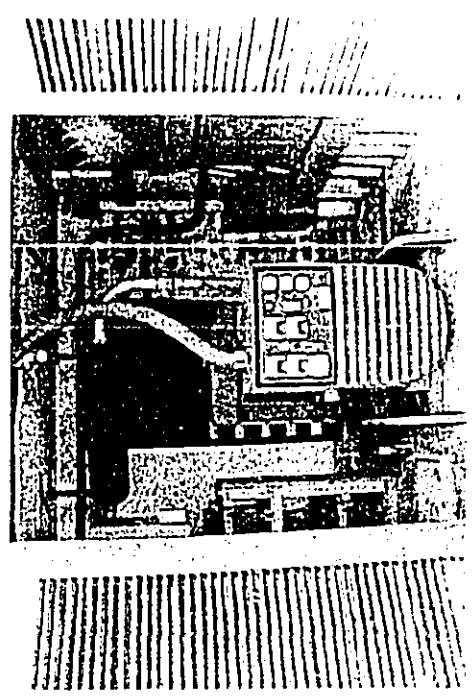
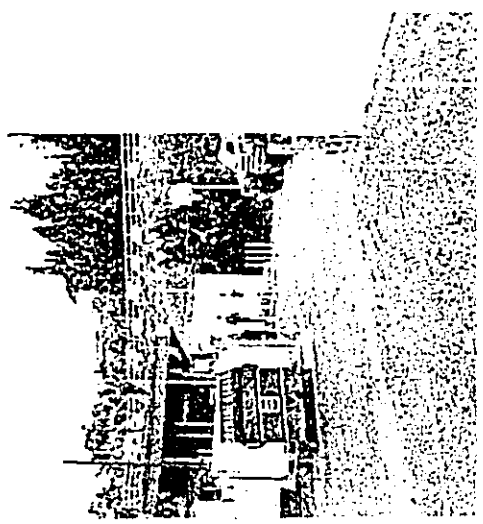


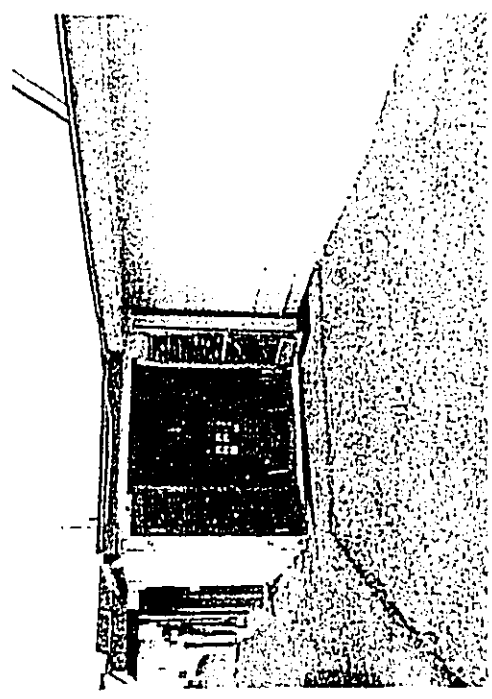
FIGURE 6B-1
Captain Cook Police Station / Boundary Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



2



Existing Tower



Replacement Tower Location

FIGURE 6C
Captain Cook Police Station / Site Photos

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

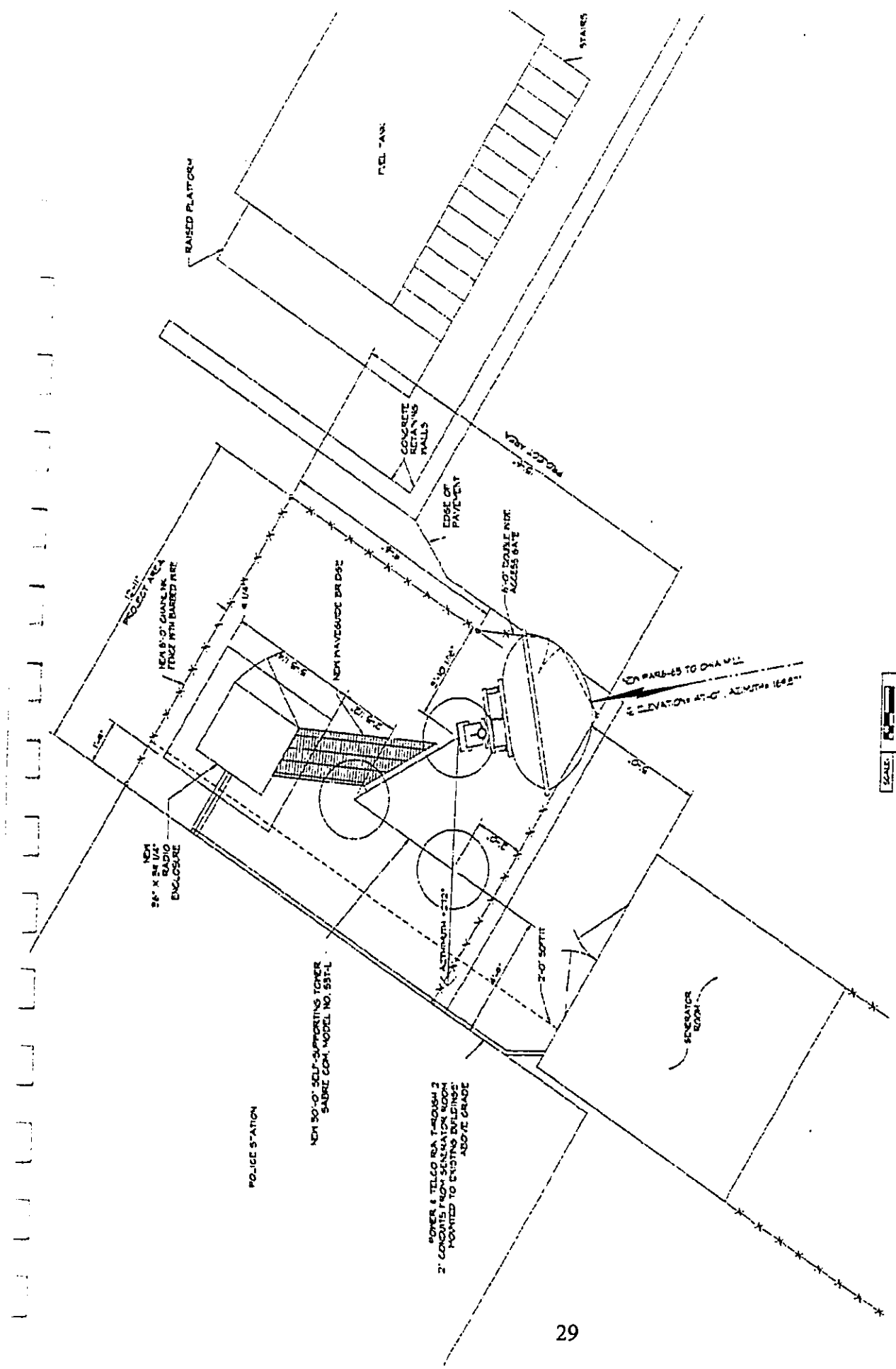


FIGURE 6D
 Captain Cook Police Station / Site Plan
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



Source: Scientel America, Inc.



June 2003

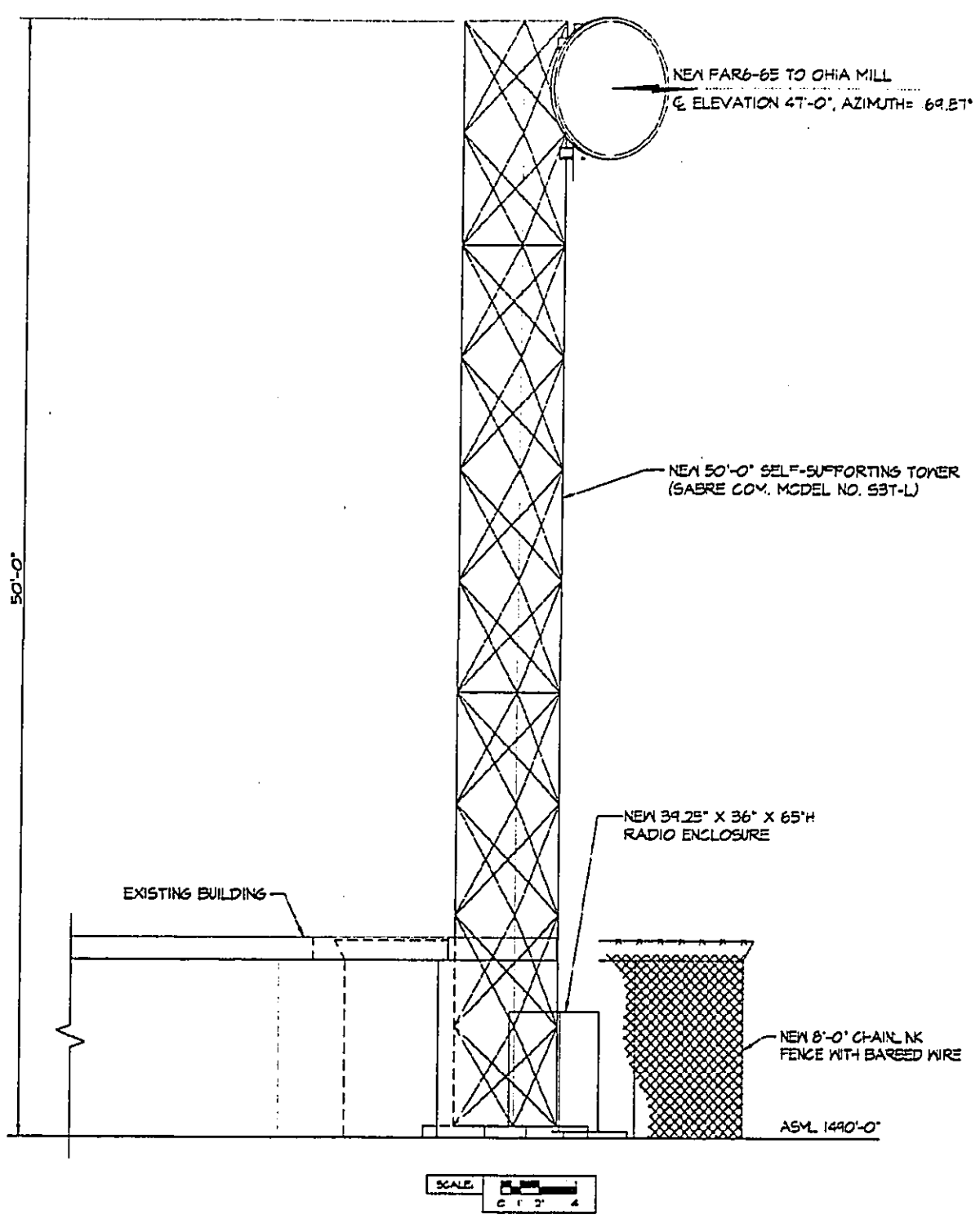


FIGURE 6E
Captain Cook Police Station / Elevation Plan (looking north)
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.2 Fire Central

Location/Access. Located at 466 Kinoole Street in the town of Hilo, Fire Central is on the southwest corner of the intersection of Kinoole and Ponahawai Streets. The property is identified as TMK 2-3-018:033. Figure 7A shows the site location on the USGS quadrangle map. Figure 7B identifies the site on the TMK map and 7B-1 depicts a boundary plan. Site photographs are provided in Figure 7C. The site is approximately 2,000 ft east northeast from Hilo Bay on Ponahawai Street and approximate 1.5 mi east of Hilo International Airport.

Existing System. The radio equipment is located at the Central Fire Station building on the second floor in a room that houses the microwave terminal, which has a battery backup system, and multiplex equipment with links from the Public Safety Building guyed tower on the roof of the 45-ft building for a total of 75 ft. The active antenna is pole mounted to the side of the building, which was done as part of the relocation to 6 GHz.

Proposed Upgrades. The upgrades will include a new tower structure approximately 100 ft to the west of the fire station building in a paved parking area adjacent to a building used by Fire Dispatch and other auxiliary services.

- New 90-ft self supporting tower
- One (1) new parabolic antenna
- New shelter to house digital radio equipment, batteries and charger
- New 8-ft chain link fence (approx. 22 ft 6 in x 31 ft 6 in)
- New generator and propane tank

Path. The Fire Central Station site is a spur path from Public Safety Building via an antenna at 85 feet above ground.

Figures 7D and 7E show the site and elevation plans, respectively.

Co-locaters. None.

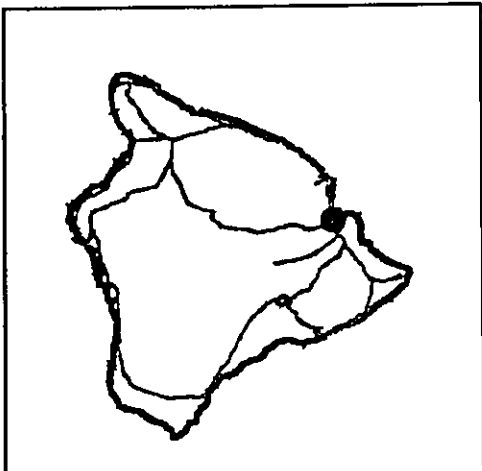
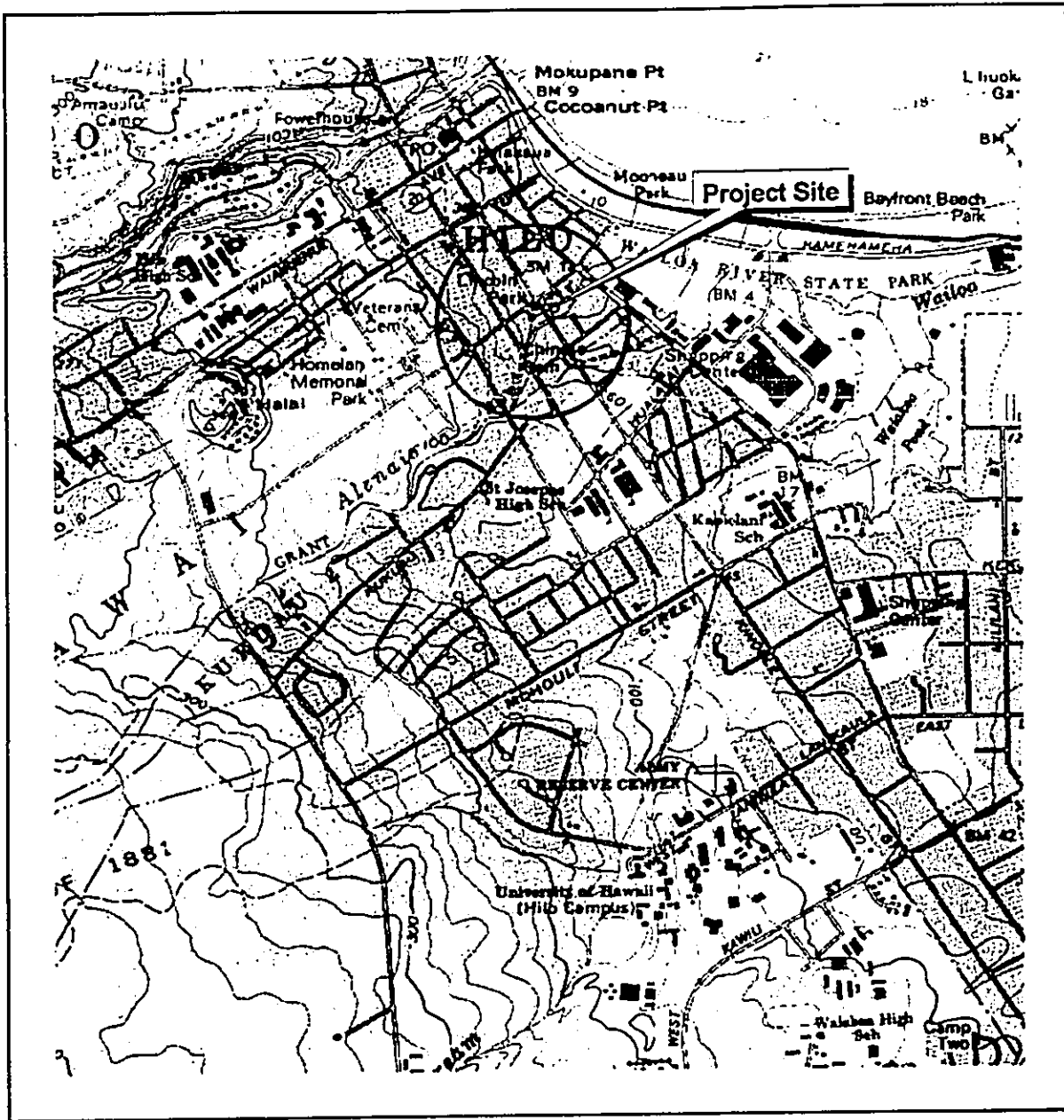
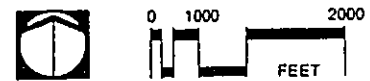
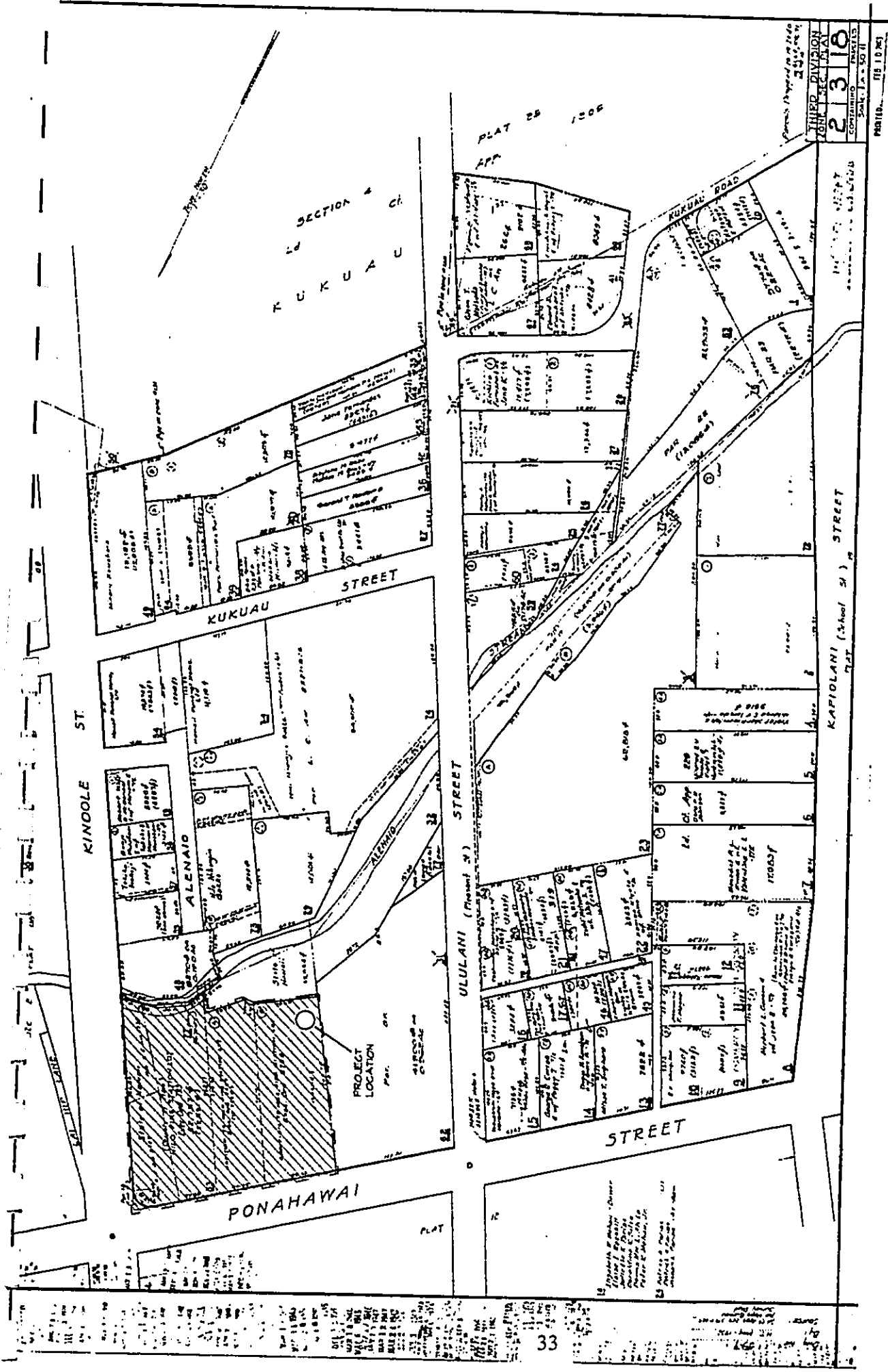


FIGURE 7A
Fire Central / Location Map
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



Source: USGS Hilo Quadrangle



LEGEND


-  = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR
-  = PROJECT LOCATION

FIGURE 7B
Fire Central / TMK: 2-3-18:33

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



NOT TO SCALE

Source: County of Hawaii Tax Map Key



June 2003

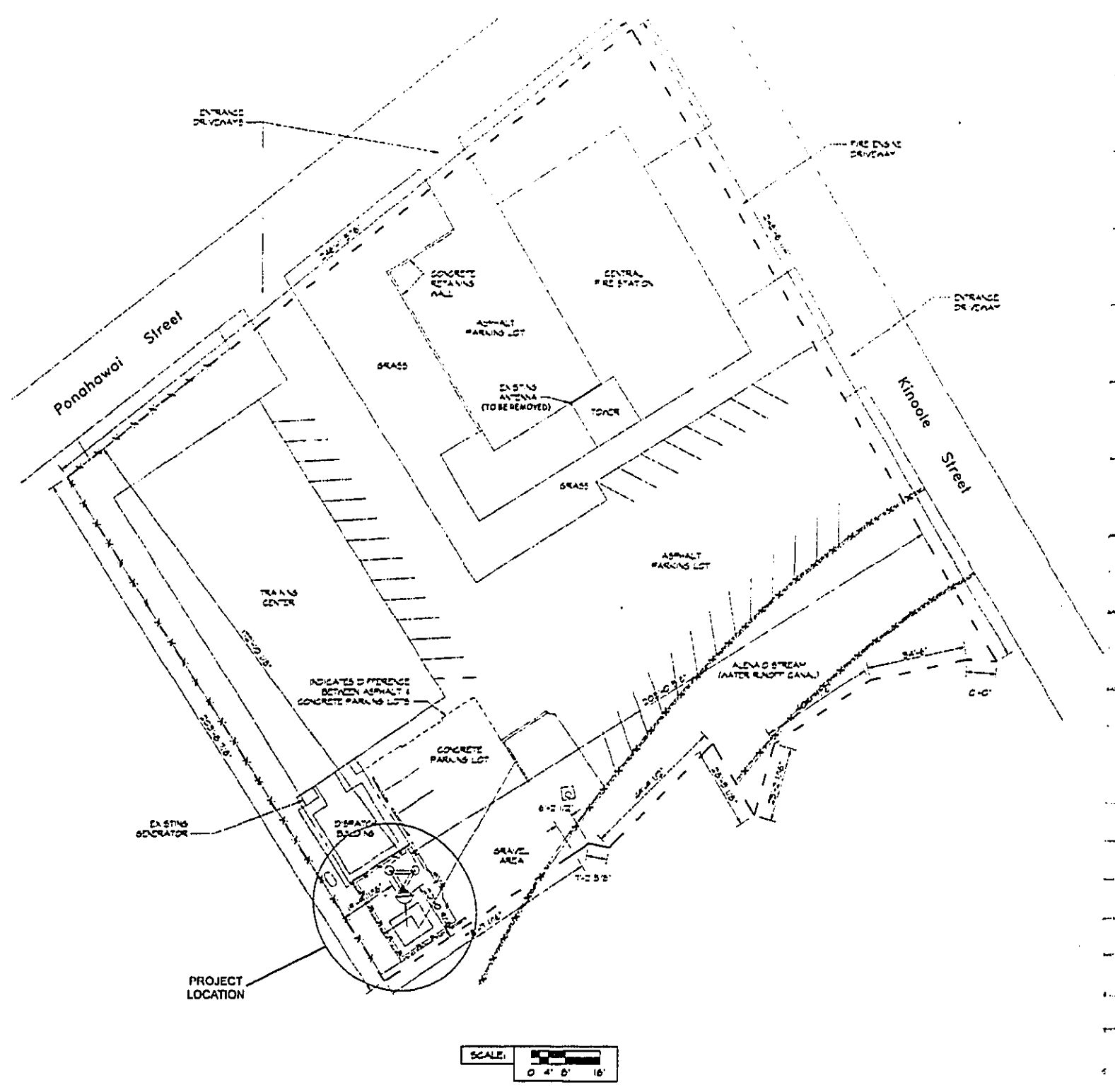
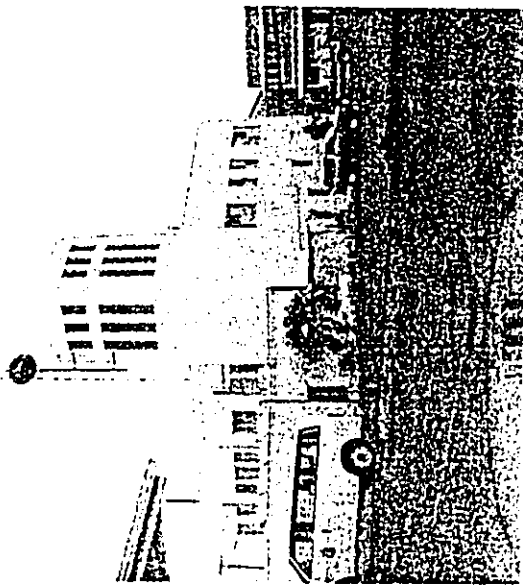
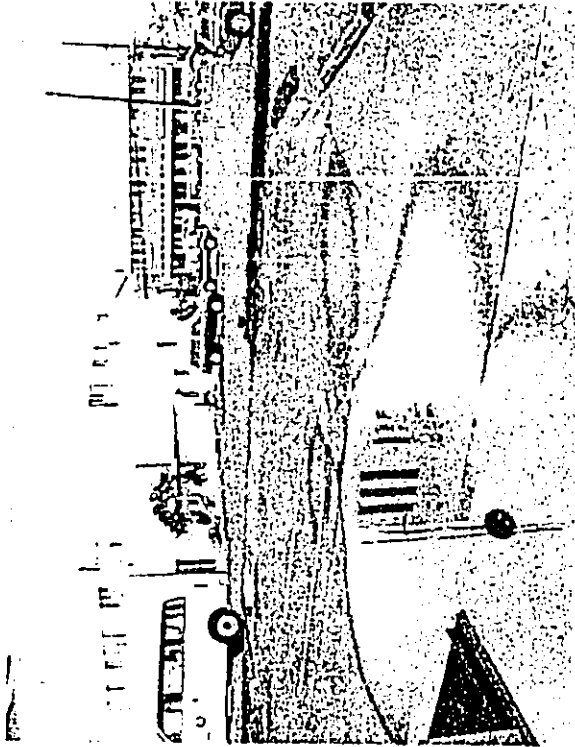
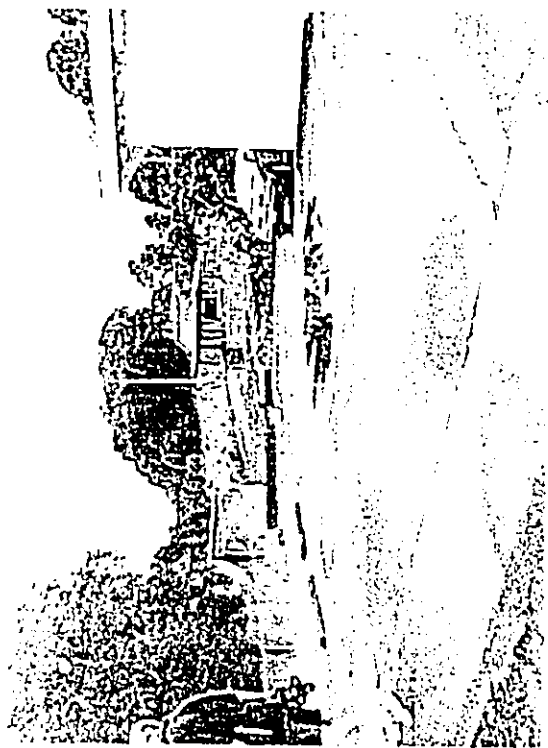


FIGURE 7B-1
 Fire Central / Boundary Plan
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES





Existing Tower



Replacement Tower Location

FIGURE 7C
Fire Central / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

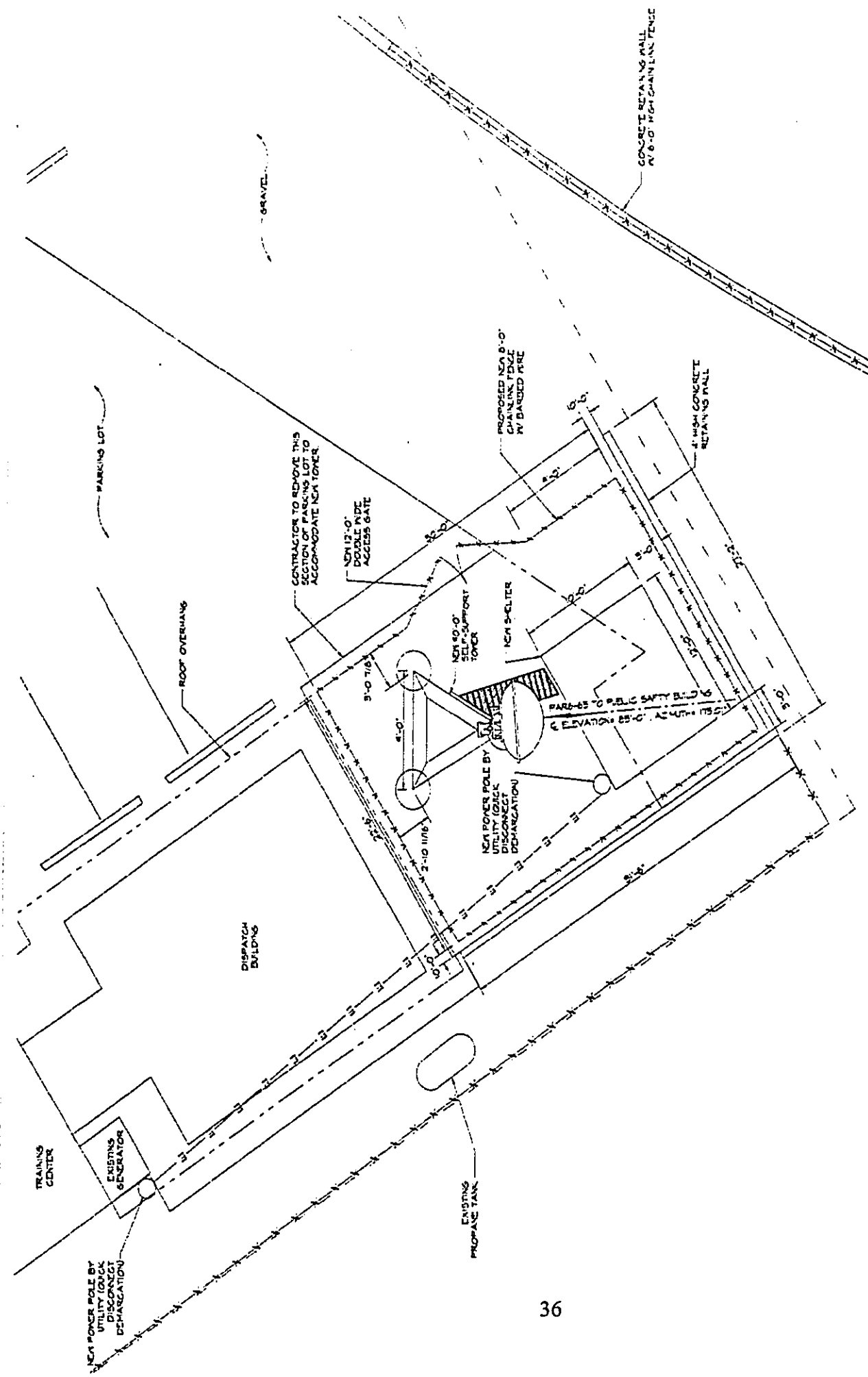


FIGURE 7D
Fire Central / Site Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



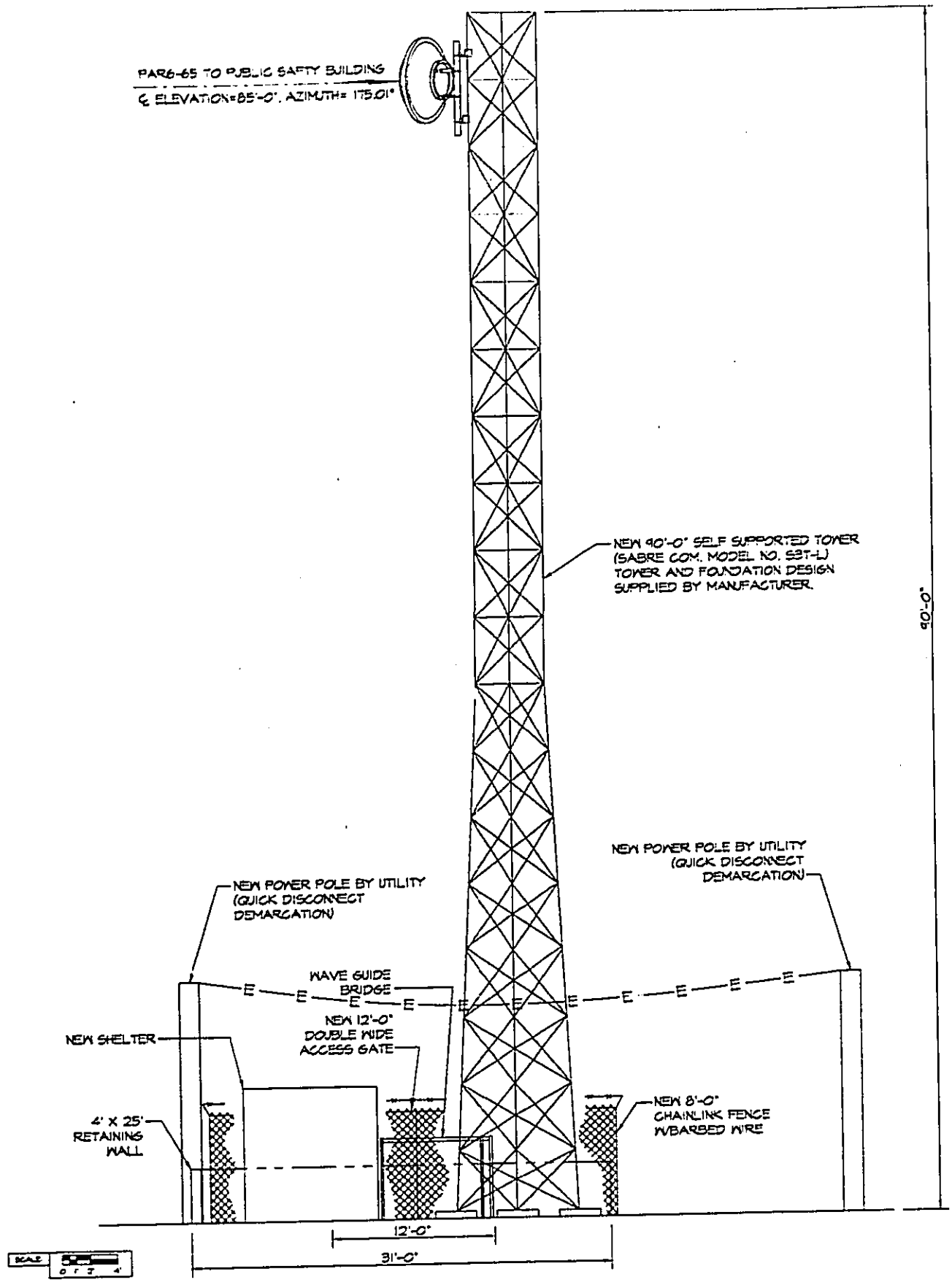


FIGURE 7E
Fire Central / Elevation Plan (looking southwest)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

Source: Scientel America, Inc.

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.3 Hamakua Police Station

Location/Access. Hamakua Police Station is located at 45-3380 Mamane Street in the town of Honokaa in the Hamakua Civic Center Complex. The property is identified as TMK 4-5-006:003. Access is from Mamalahoa Highway (Hwy 11) and Mamane Street. Figure 8A shows the site location on the USGS quadrangle map. Figure 8B identifies the site on the TMK map and Figure 8B-1 depicts a boundary plan. Site photographs are provided in Figure 8C.

Existing System. This site is located at the police station in Honokaa on the north part of the Hamakua coast. The microwave radio equipment is located in a ground floor room that serves as an exercise room. The battery bank is installed in a wooden cabinet in the sub-level parking area. The microwave antennas are installed on an 80 ft monopole tower in the back parking area adjacent to the fence line. The site is supplied with commercial power and is equipped with an emergency generator.

Proposed Improvements. The upgrades will include a new tower structure approximately 100 ft to the northeast of the existing monopole in a grassed area.

- New 100-ft monopole tower
- Three (3) new parabolic antennas
- New shelter to house digital radio equipment, batteries and charger
- New generator and propane tank
- New 8-ft high chain link fence (approx. 30 ft x 40 ft)

Paths. The Hamakua Police Station site provides a backbone path south to Iolehaehae via an antenna at 90 feet above ground and a backbone path northwest to Kamehameha Park via antennas at 95 feet and 65 feet above ground.

Figures 8D and 8E show the site and elevation plans, respectively.

Co-Locaters. None

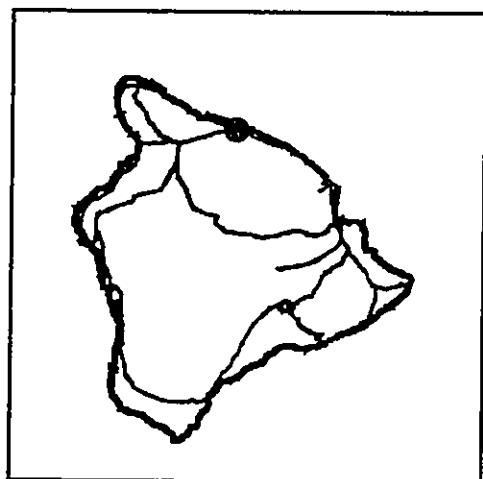
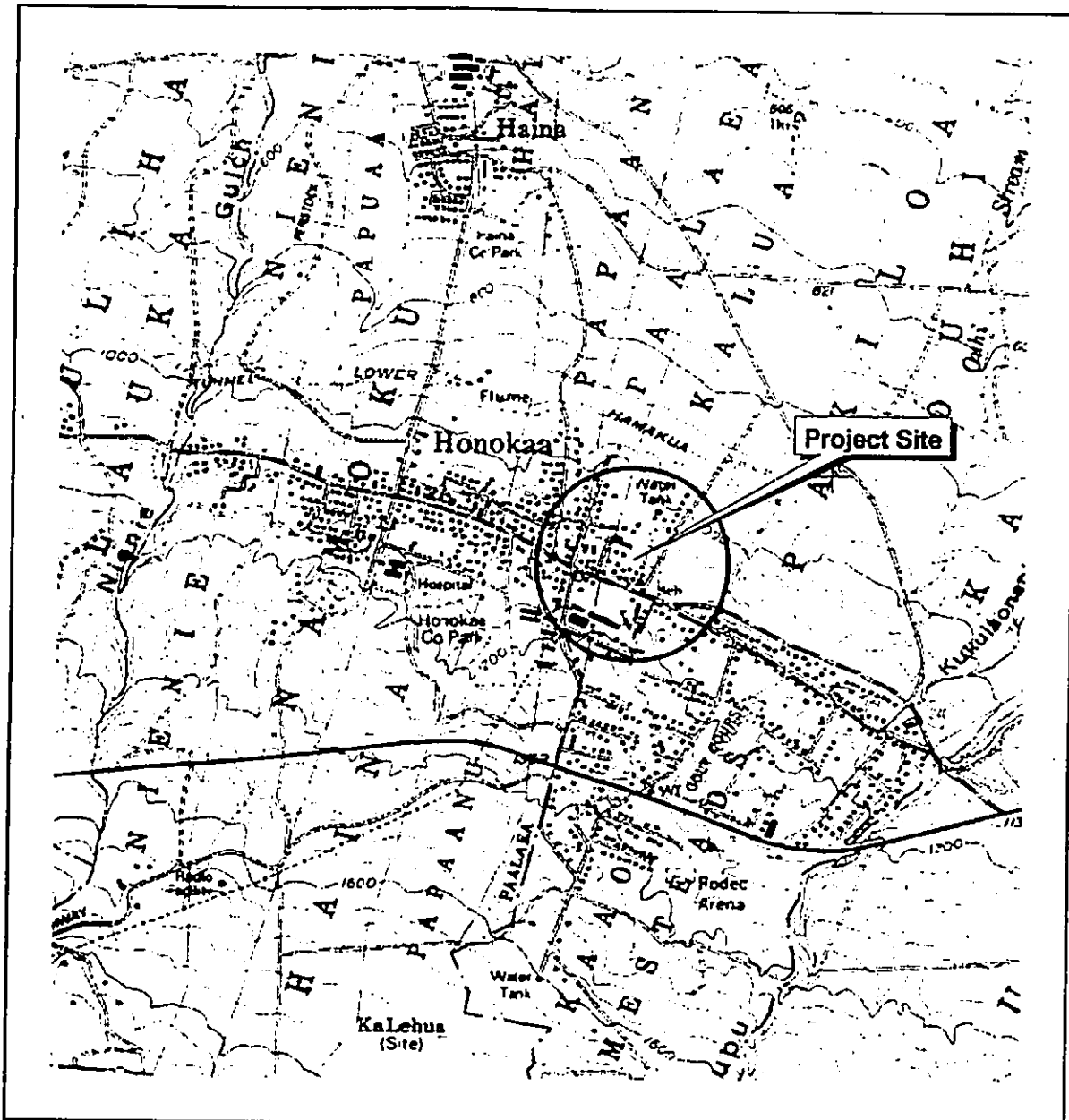
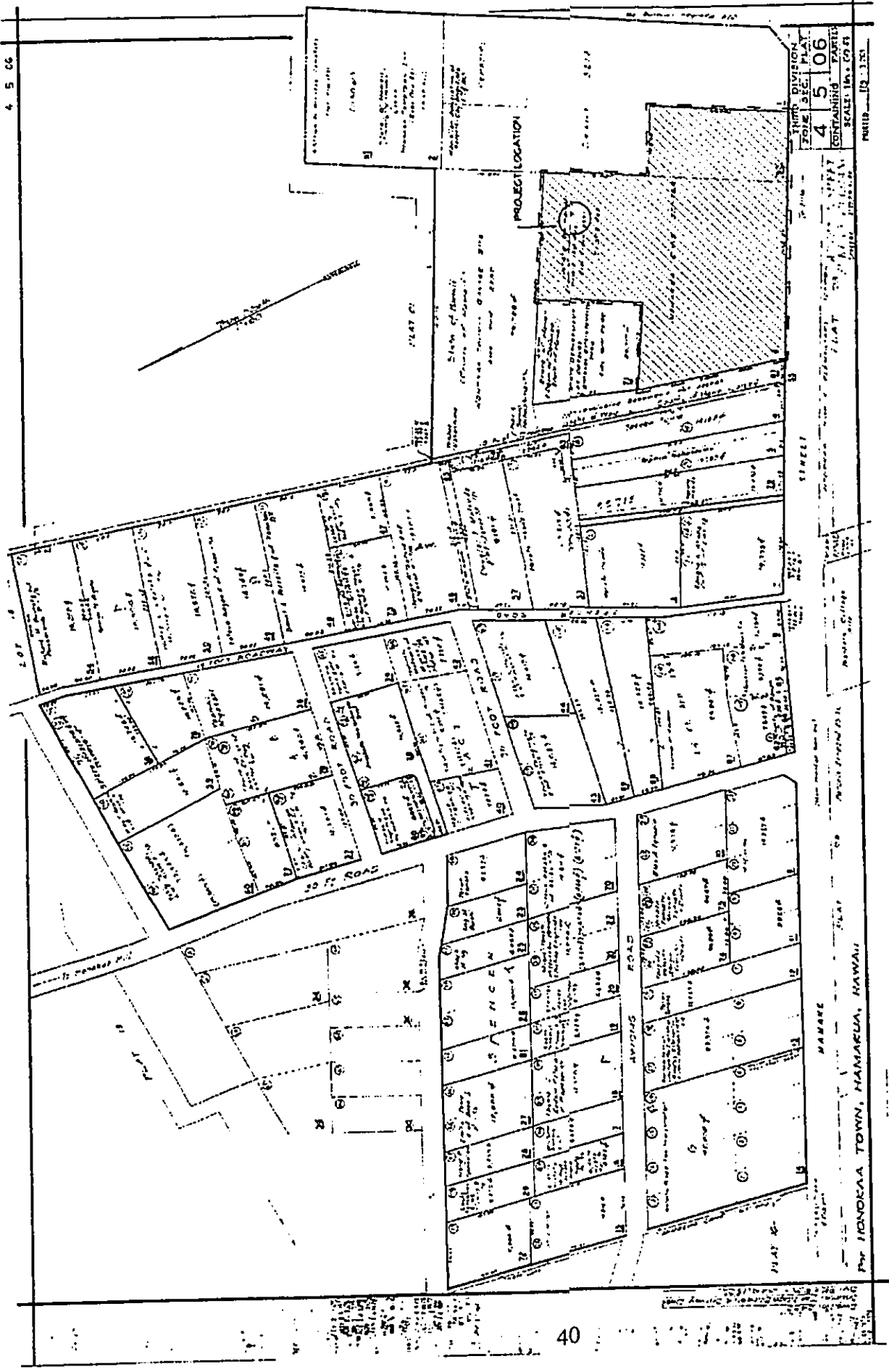


FIGURE 8A
 Hamakua Police Station / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES





LEGEND

[Hatched Box] = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR

[Circle] = PROJECT LOCATION

FIGURE 8B
Hamakua Police Station / TMK: 4-5-6:03

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



NOT TO SCALE



June 2003

Source: County of Hawaii Tax Map Key

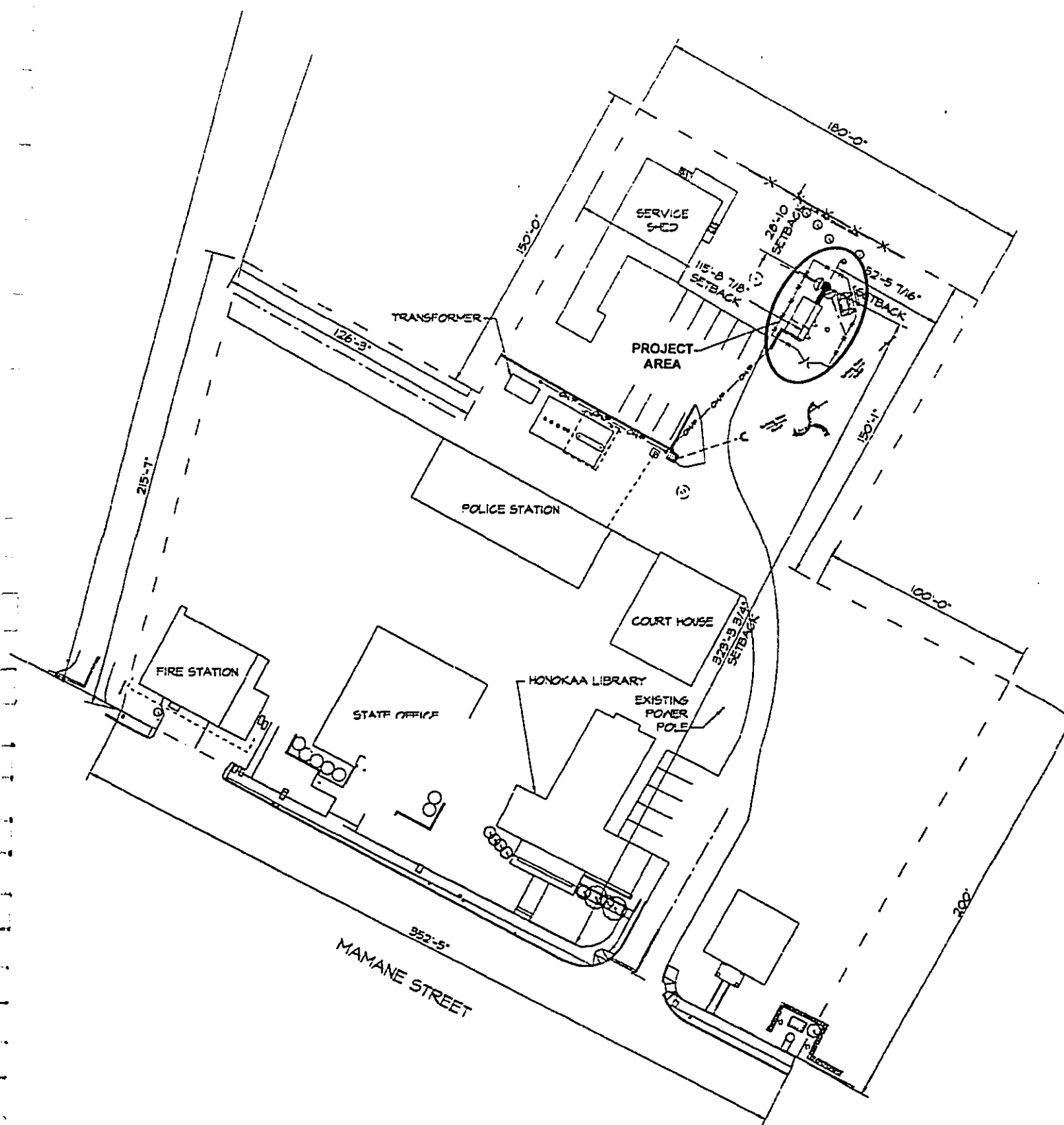
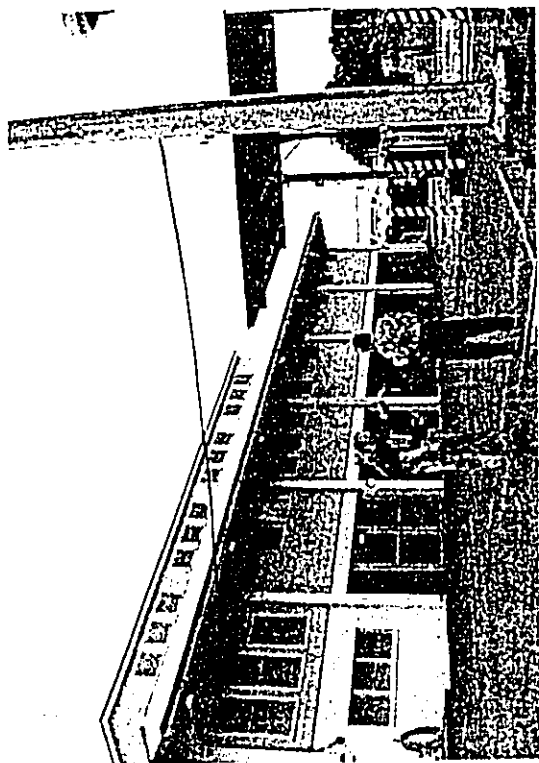
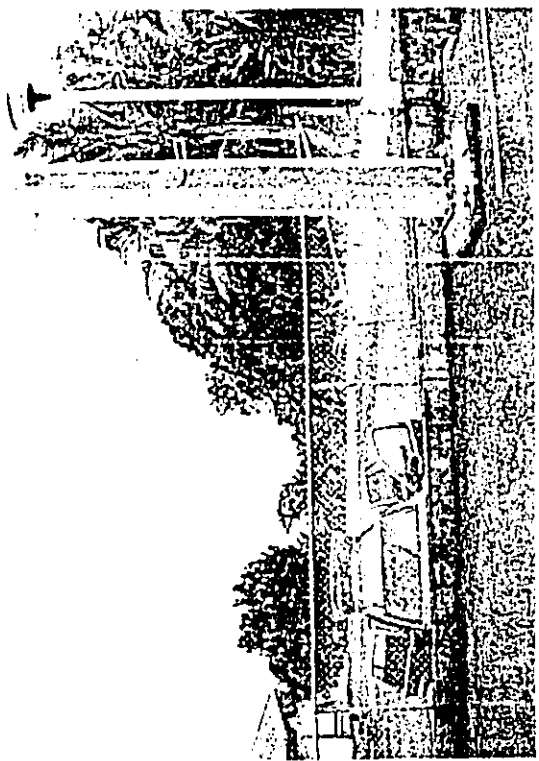


FIGURE 8B-1
Hamakua Police Station / Boundary Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



Existing Monopole Tower



Replacement Tower Location on Lawn Area



FIGURE 8C
Hamakua Police Station / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

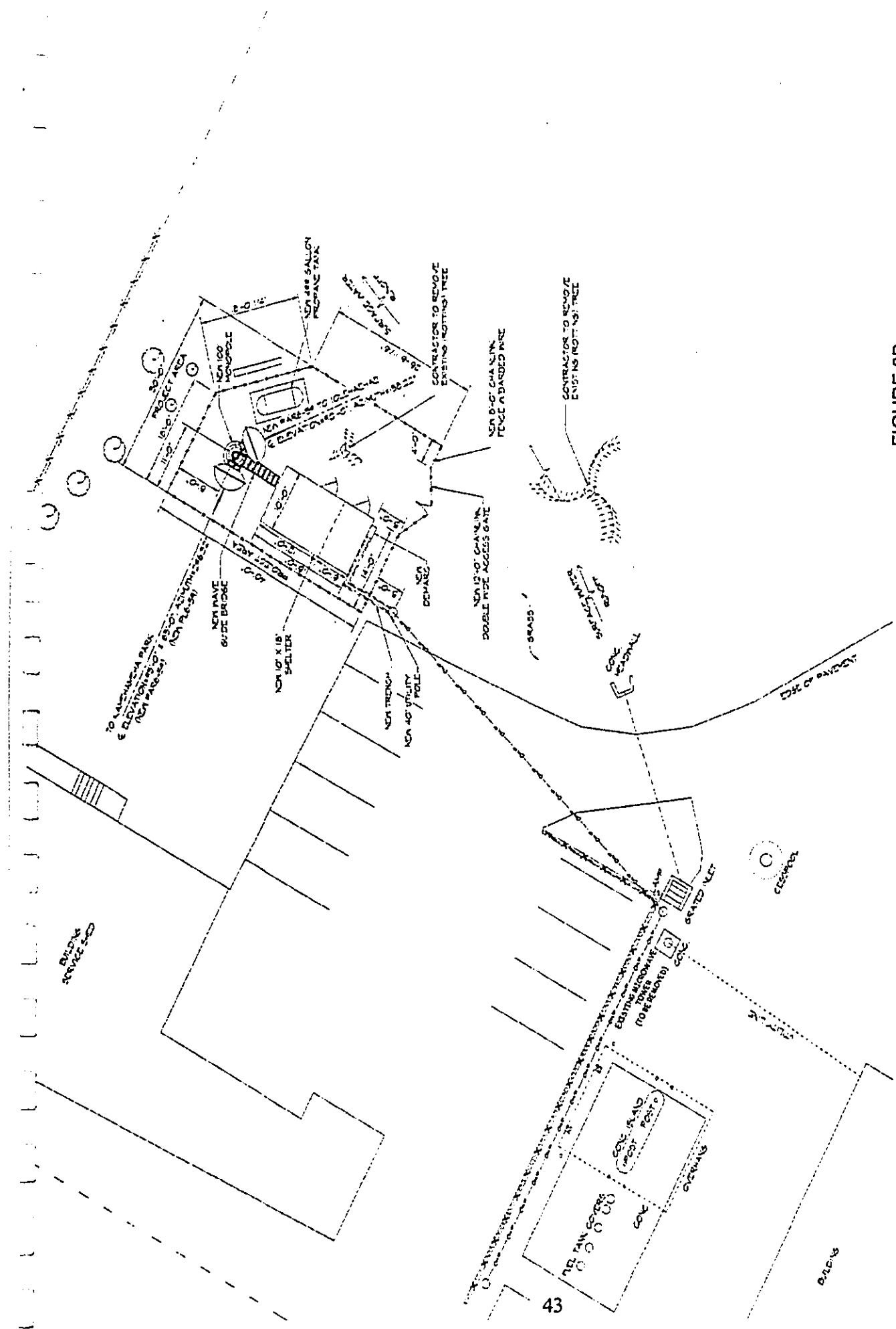


FIGURE 8D
Hamakua Police Station / Site Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003



Source: Scientel America, Inc.

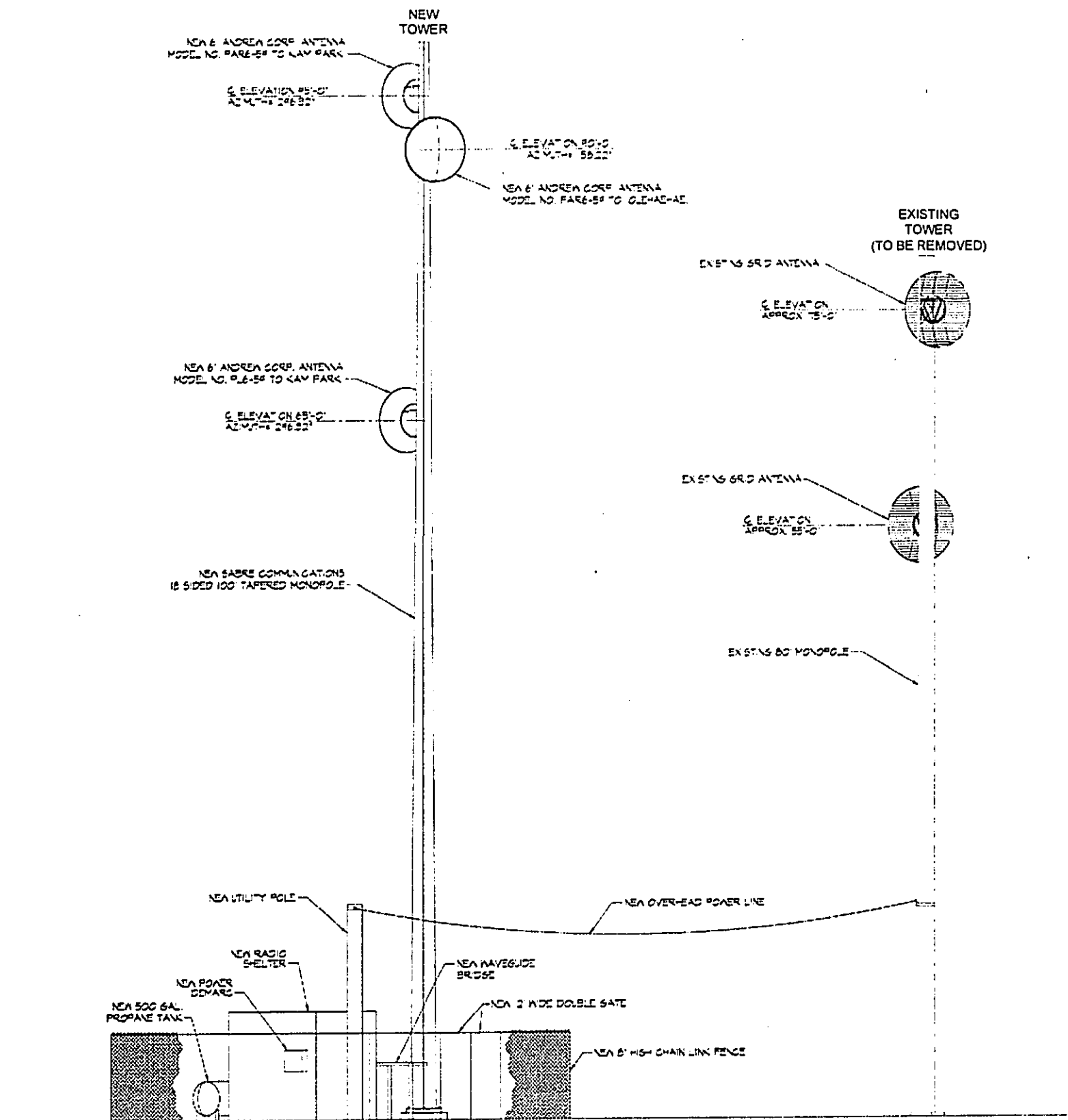


FIGURE 8E
Hamakua Police Station / Elevation Plan (looking north)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

Source: Scientel America, Inc.

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.4 Hilo Baseyard

Location/Access. Located on East Lanikaula Street in Hilo, Hilo Baseyard is located in the Kanoelehua Industrial Park. Access is from the Volcano Highway (Hwy 11). The property is identified as TMK 2-2-058:018. Access to the property is from Highway 11 and East Lanikaula Street. Figure 9A shows the site location on the USGS quadrangle map. Figure 9B identifies the site on the TMK map. Site photographs are provided in Figure 9C.

Existing System. This site is located at the County Baseyard in Hilo and is a relatively new radio site that was completed as part of the microwave looped system upgrade. Existing at the site are the 100-ft self-supporting tower and radio shelter; a 10 ft x12 ft block unit. The shelter is divided into two separate sections designated for radio equipment and emergency generator. The site is supplied with commercial power.

Proposed Improvements. Preliminary test results indicate that the existing tower structure is insufficient and will require refurbishing. Subsequent testing will be performed to confirm the results. If testing results indicate that a new tower is required, the site would be located adjacent to the presently existing tower.

- Refurbish 100-ft self supporting tower
- Three (3) new parabolic antennas
- Refurbish existing shelter; new digital radio equipment, batteries and charger
- New generator; reuse existing propane tank
- New 8 ft-high chain link fence (approximately 25 ft x 51 ft)

Paths. The Hilo Baseyard provides a backbone path northwest to the Public Safety Building via an antenna at 50 feet above ground and a backbone path northwest to Iolehaehae via antennas at 60 feet and 30 feet above ground.

Figures 9D and 9E show the site and elevation plans, respectively.

Co-Locaters. Department of Land and Natural Resources (DLNR), Federal Bureau of Investigation (FBI), National Oceanic and Atmospheric Administration (NOAA), Hawaii Electric Light Company (HELCO)

- 21-ft Fiberglass whip antennas

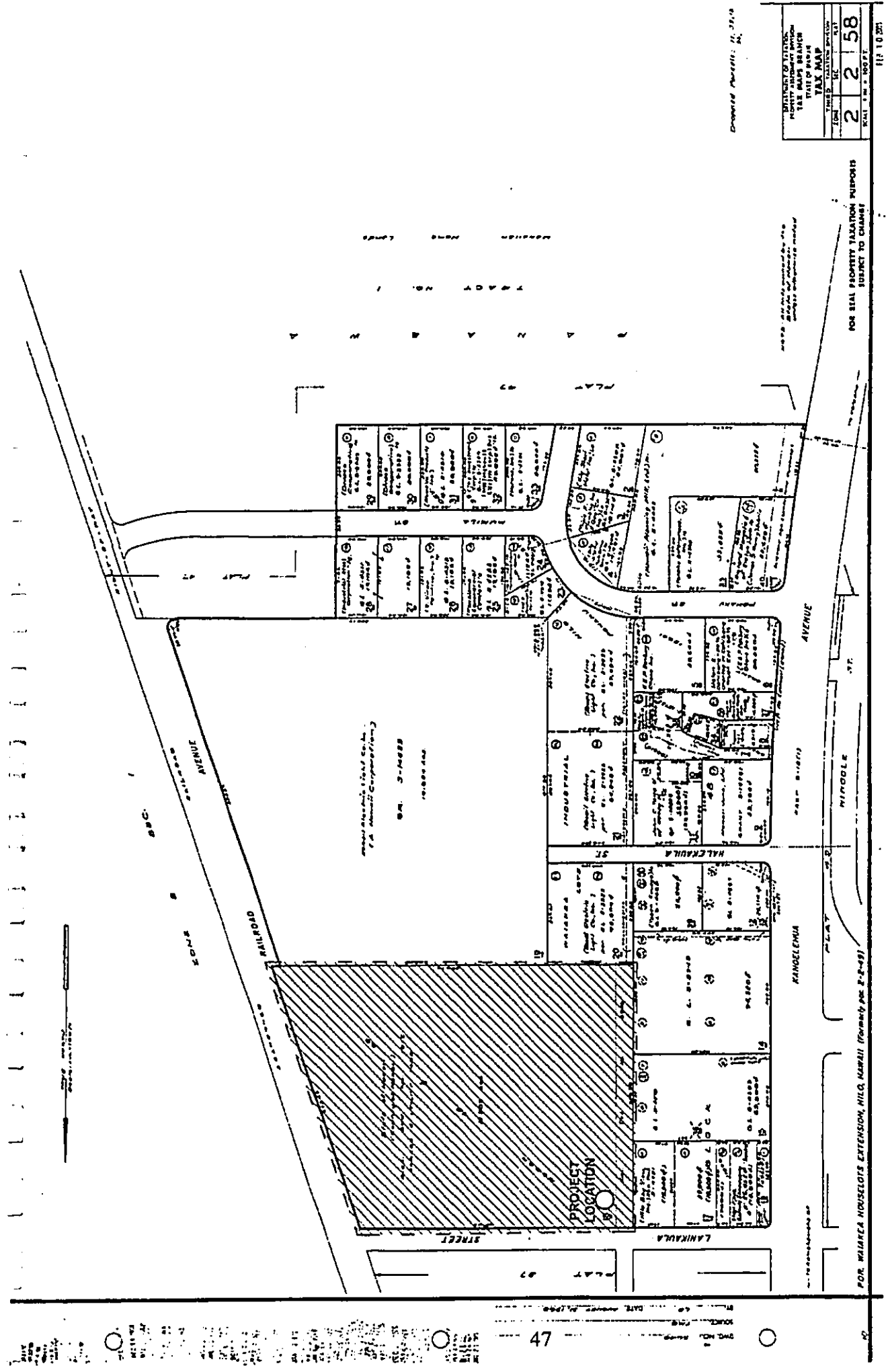


FIGURE 9B
Hilo Baseyard / TMK: 2-2-58:18
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

LEGEND

= LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR

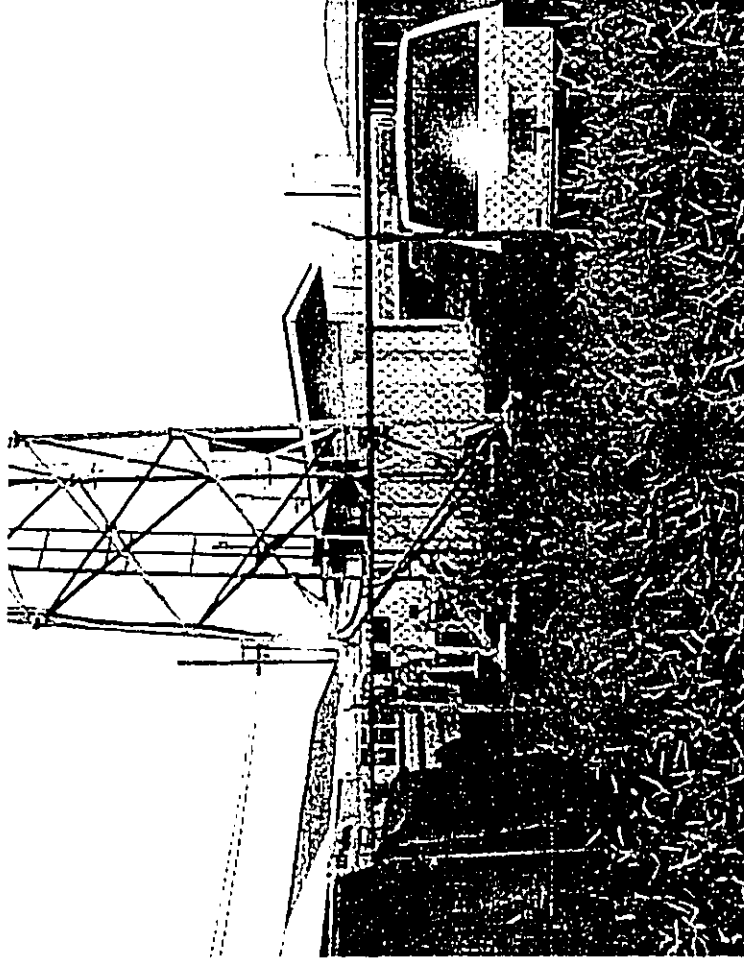
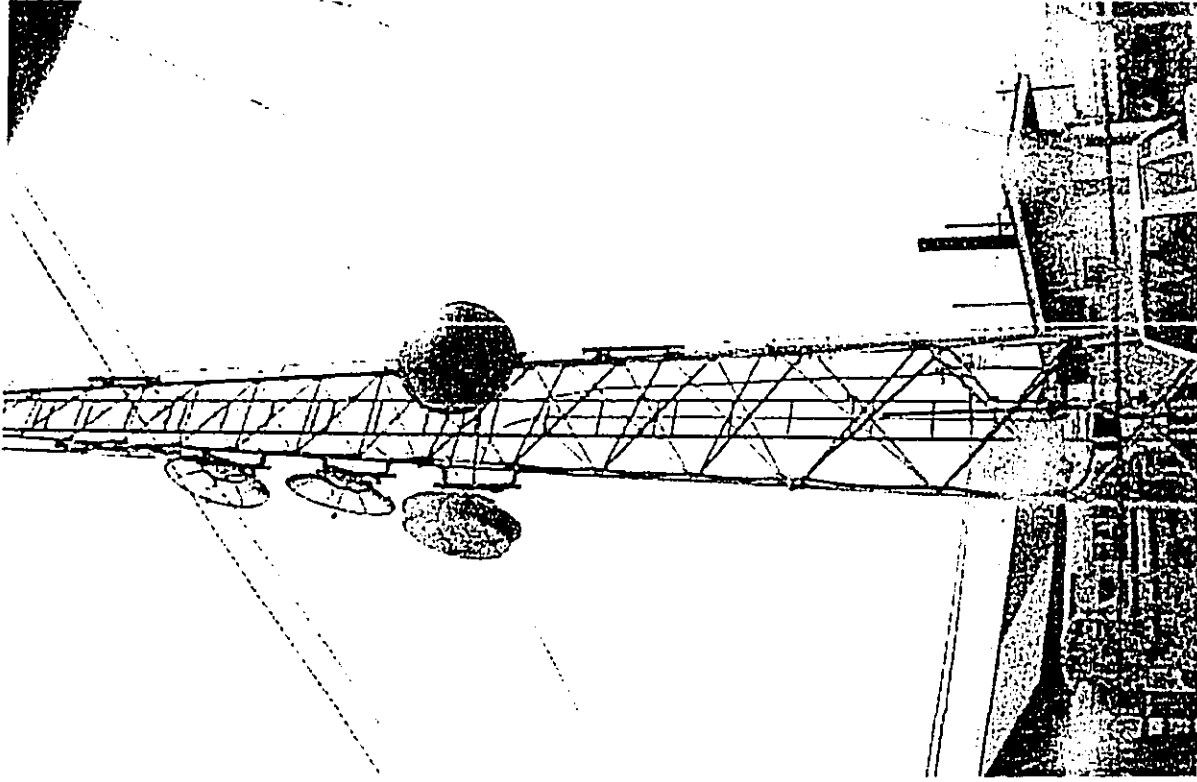
= PROJECT LOCATION

Source: County of Hawaii Tax Map Key

NOT TO SCALE

June 2003





Existing Tower to be Refurbished

FIGURE 9C
Hilo Baseyard / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

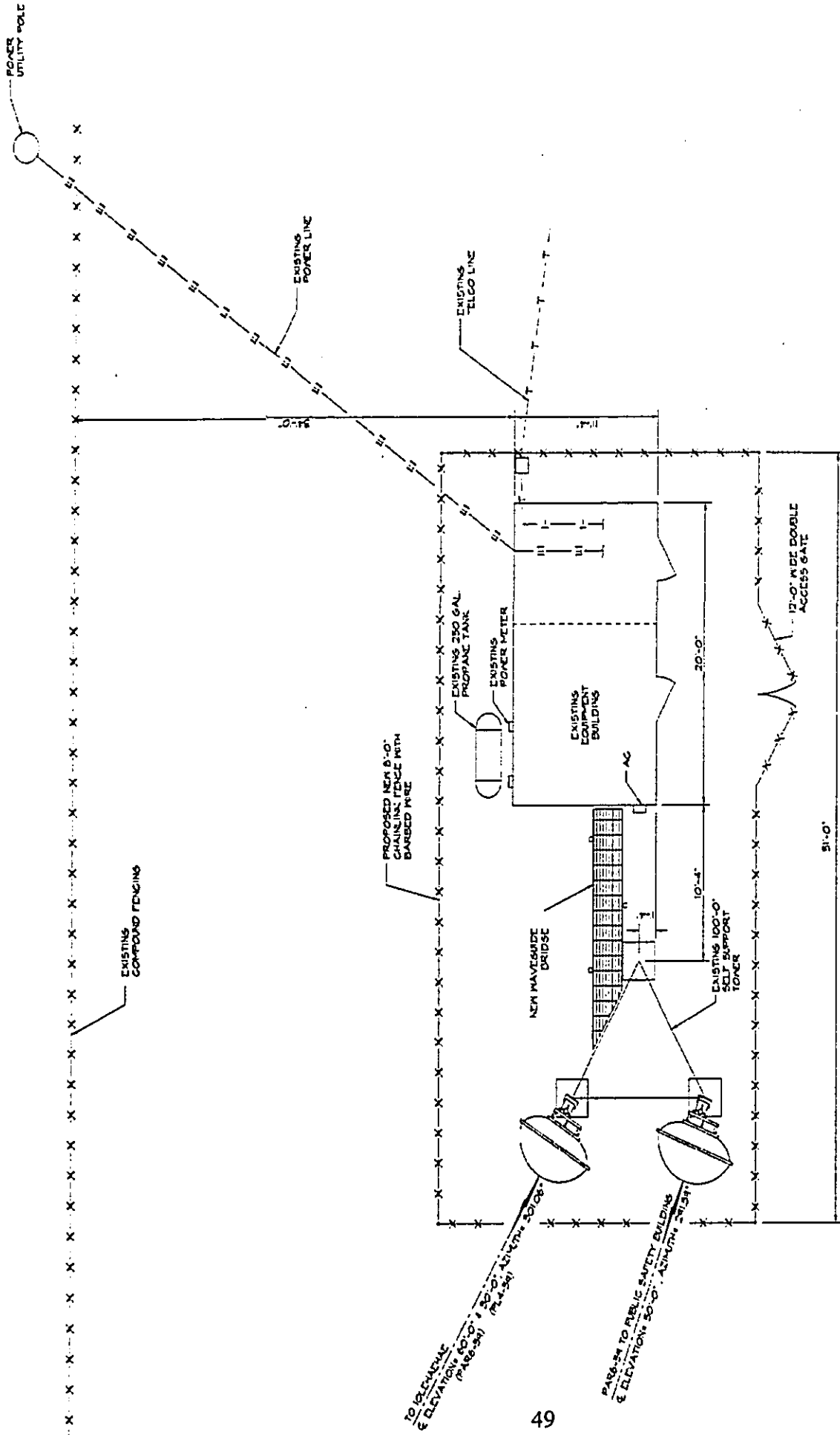


FIGURE 9D
Hilo Baseyard / Site Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



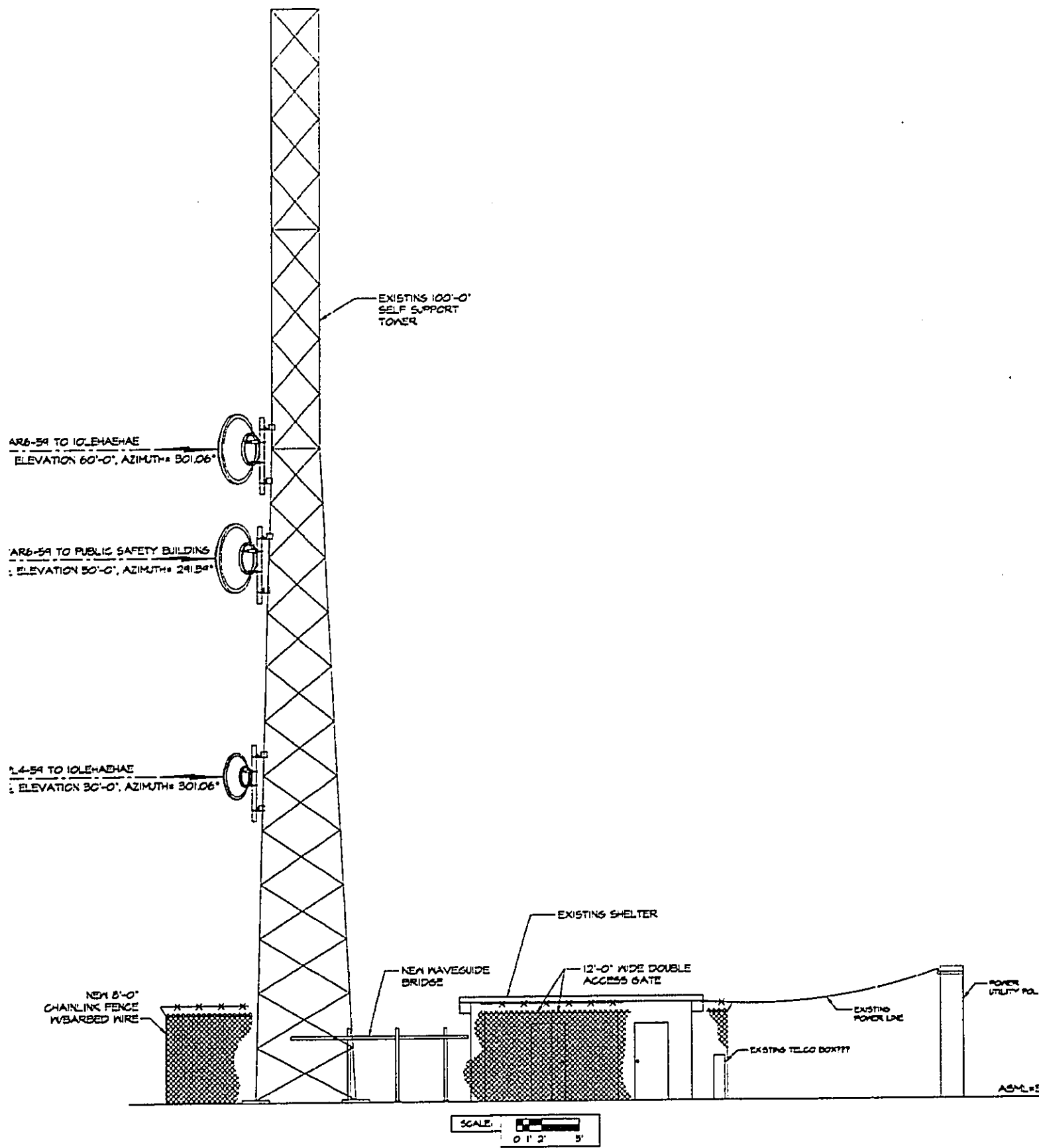


FIGURE 9E
Hilo Baseyard / Elevation Plan (looking north)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.5 Huehue Ranch

Location /Access. The site is located in the Kaupulehu land division in North Kona and mauka of Mamalahoa Highway (Hwy 11). Access to the property is from Mamalahoa Highway through a dirt road. The HELCO-owned property is identified as TMK 7-2-002:013. Figure 10A shows the site location on the USGS quadrangle map. Figure 10B identifies the site on the TMK map. Site photographs are provided in Figure 10C.

Existing System. This site is located on the Huehue Ranch and is primarily a HELCO site but has several other user buildings and towers. The County police and fire microwave radio equipment is installed in an older HELCO building and the County antennas are installed on the 100-ft 4-legged self-supporting tower adjacent to the radio shelter. The facility is in good condition, however the radio shelter is crowded with limited available capacity. HELCO provides power to this site and an emergency backup generator.

Proposed Improvements. Preliminary test results indicate that the existing tower structure is insufficient and will require refurbishing. Subsequent testing will be performed to confirm the results. If a new tower is required it would be located adjacent to the presently existing tower.

- Refurbish 100-ft self-supporting tower
- Four (4) new parabolic antennas
- Refurbish existing shelter; new digital radio equipment, batteries and charger
- Use existing generator and propane tank

Paths. The Huehue Ranch site provides a spur path northeast to the Waimea Police Station via antennas at 67 feet and 37 feet above ground and a spur path north-northeast to Kahua Ranch via antennas at 60 feet and 30 feet above ground.

Co-Locaters. None.

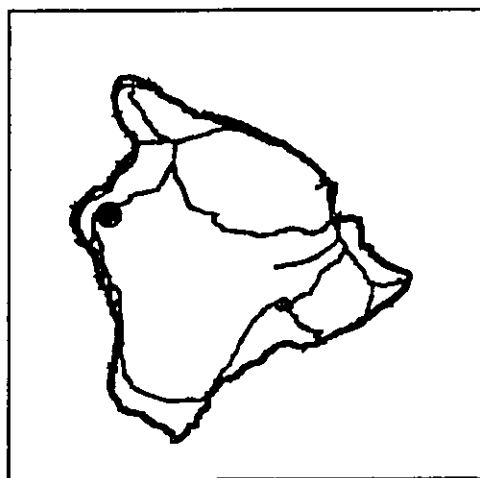
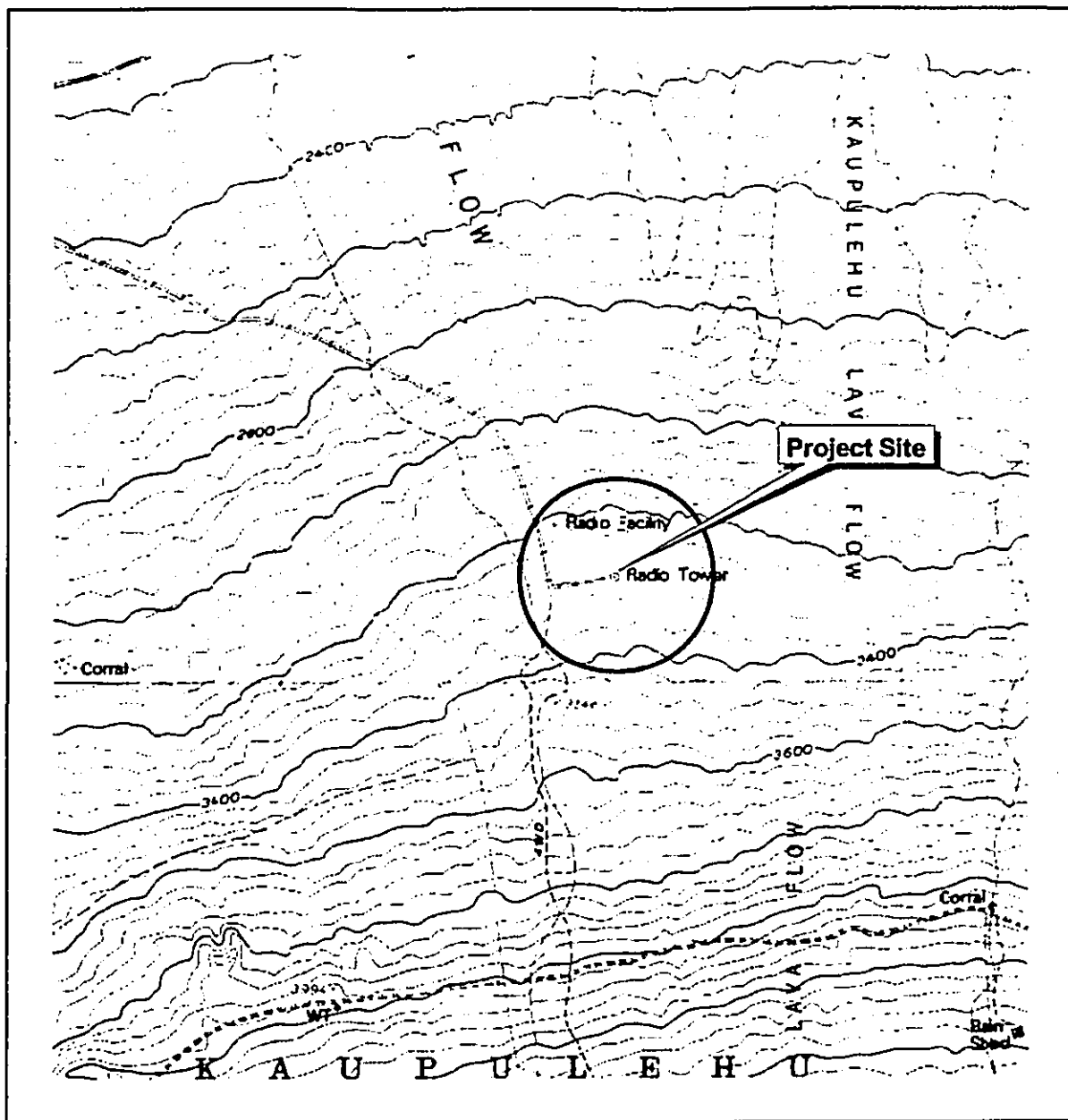
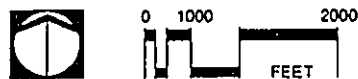


Figure 10A
 Huehue Ranch
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES

Source: USGS Kiholo Quadrangle



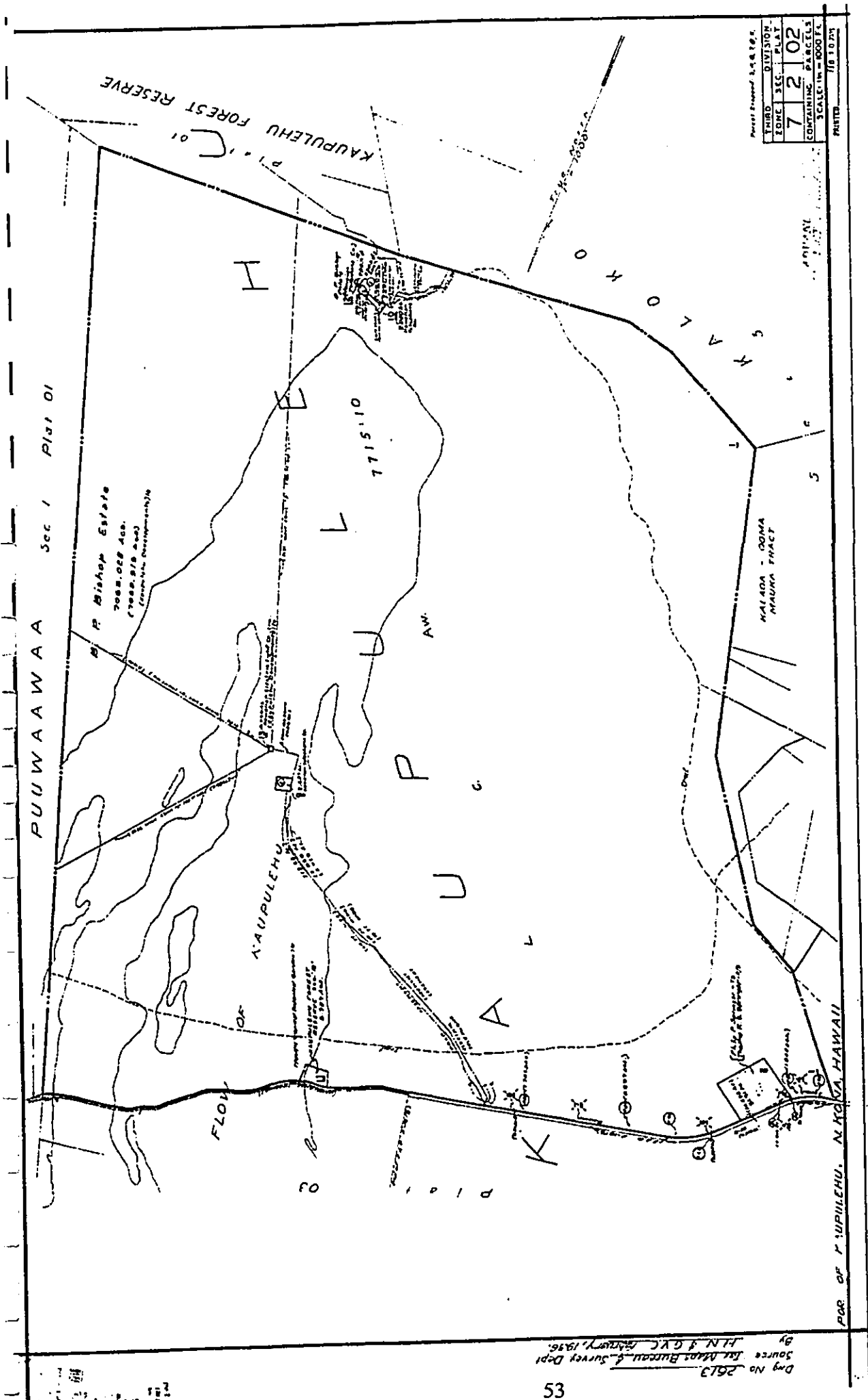


FIGURE 10B
 Huehue Ranch / TMK: 7-2-02:13
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



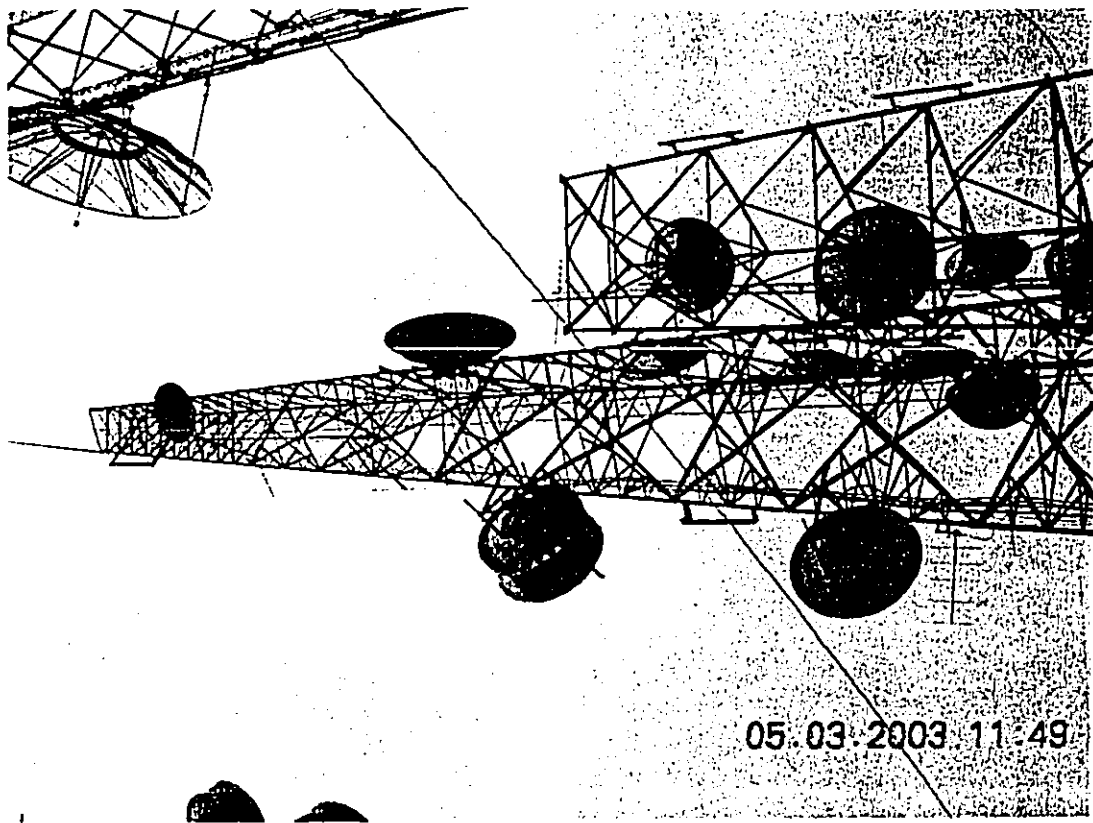
June 2003



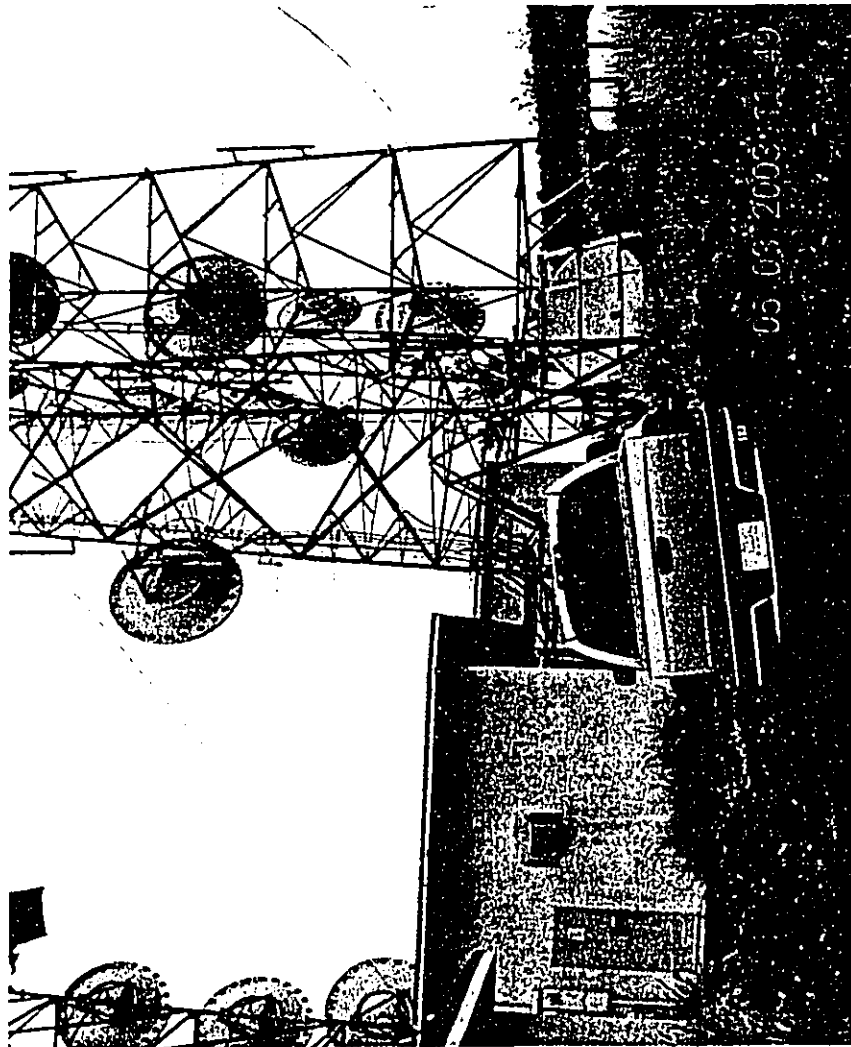
NOT TO SCALE

Source: County of Hawaii Tax Map Key

Dwg No 2613
 Source: Tax Maps Bureau & Survey Dept
 By: H.N. & G.V.C. February, 1956.



Existing Tower



Existing Tower to be Refurbished

FIGURE 10C
 Huehue Ranch / Site Photos
 COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.6 Iolehaehae

Location/Access. Iolehaehae puu is a cinder cone at 8,121 feet above mean sea level on the northeastern flank of Mauna Kea. The puu is located approximately 400 feet beyond the Mauna Kea Forest Reserve boundary. The site is in the district of Hamakua and surrounded by lands which are part of the Kukaiau Ranch. Access to the property is through a ranch road from Mana Road, which originates in Waimea approximately 23 miles northwest, or from Keanakolu Road, which connects to the Saddle Road to the south. Mana Road and Keanakolu Road are continuous segments of the same road. The property is identified as TMK 4-1-006:007. Figure 11A shows the site location on the USGS quadrangle map. Figure 11B identifies the site on the TMK map. Site photographs are provided in Figure 11C.

Existing System. The remote Iolehaehae location supports several existing telecommunications facilities. The County's facility is a solar powered site. It includes a 40-ft guyed tower, a radio equipment building, and a photovoltaic system of solar panels and batteries.

Proposed Improvements. The new facility will be directly adjacent and to the west of the existing tower. The solar collector system will continue as the primary energy source. The following equipment will be installed and enclosed in a chain link fence.

- New 50-ft self-supporting tower
- Three (3) new parabolic antennas
- New shelter to house digital radio equipment, batteries and charger
- New generator and propane bottles
- New 8 ft high triangle chain link fence (approx. 50 ft x 50 ft x 50 ft)
- New photovoltaic solar panel system

Paths. Iolehaehae provides a repeater path north to the Hamakua Police Station via a 15-ft above ground antenna and a repeater path southeast to Hilo Baseyard via antennas at 45 feet and 15 feet above ground.

Figures 11D and 11E show the site and elevation plans, respectively.

Co-Locaters. DLNR, Department of Transportation (DOT), FBI

- 21-ft Fiberglass whips

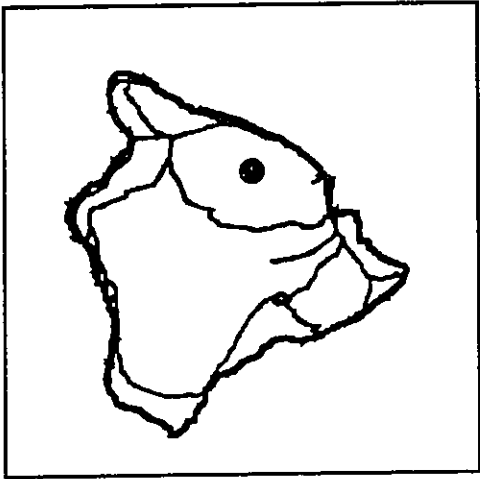
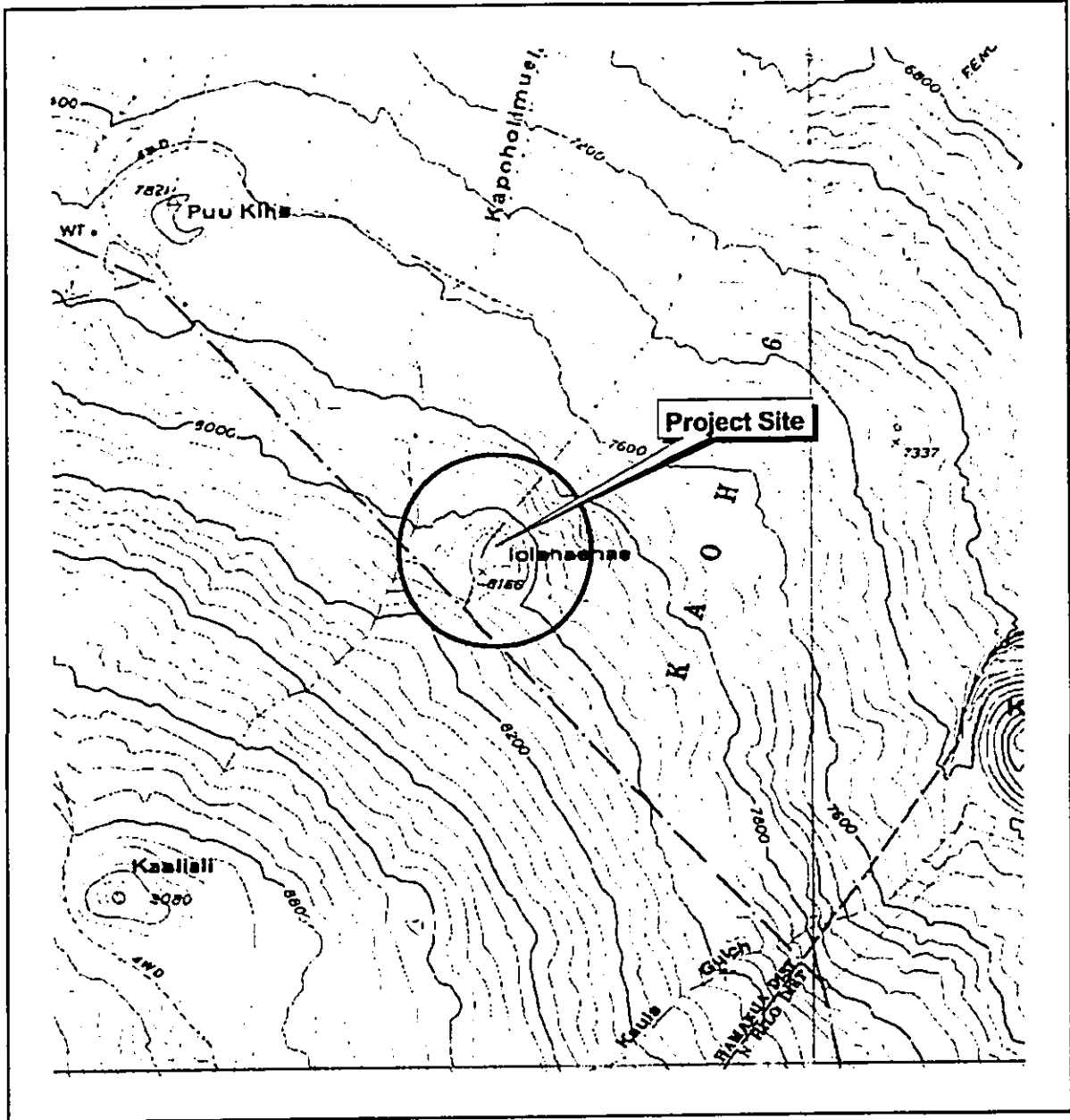
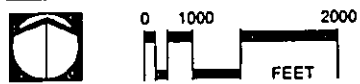
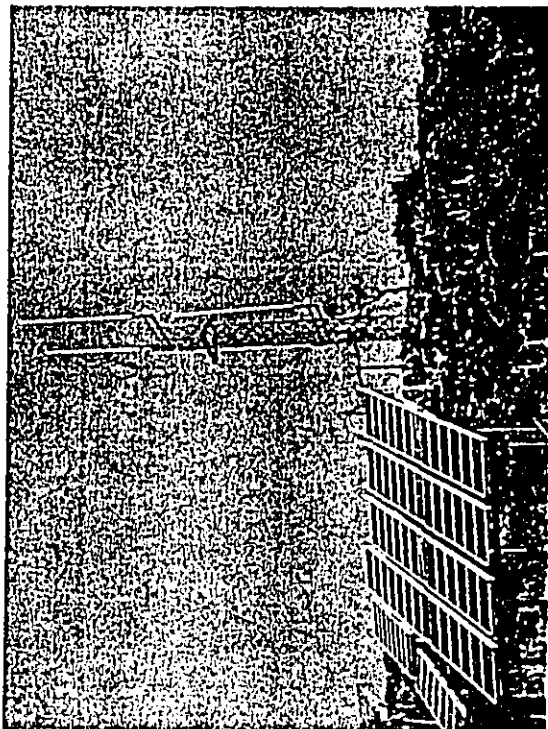


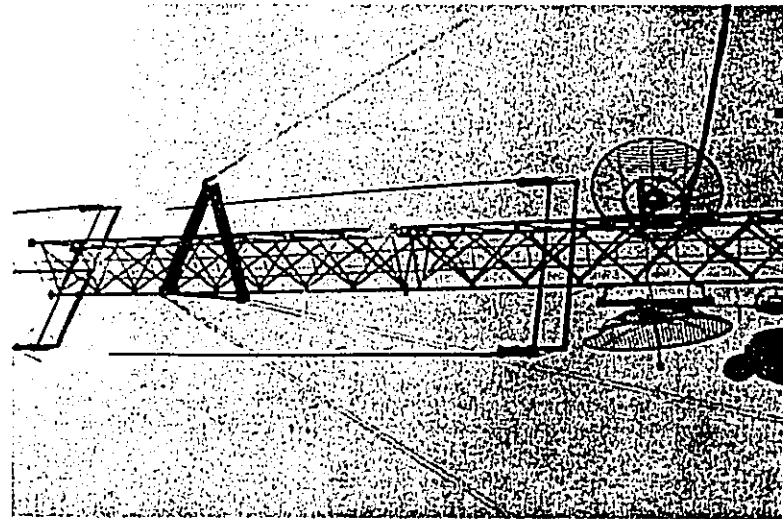
FIGURE 11A
Iolahaehae / Location Map
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



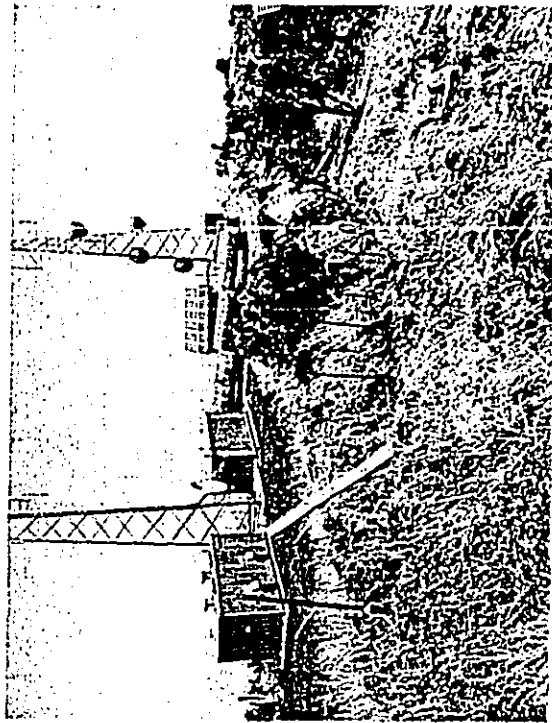
I O L A H A E H A E



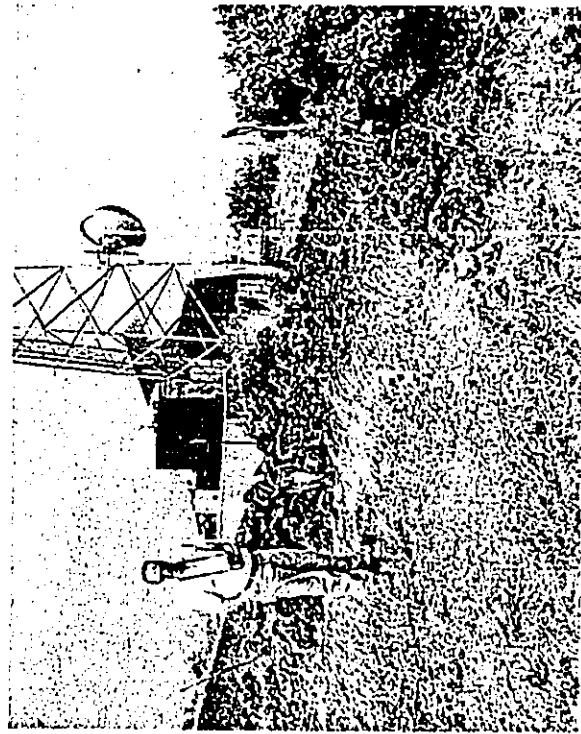
Replacement Tower Site to the Left of Existing Tower
Photovoltaic Solar Panels in the Foreground



Existing Tower



Other Towers at the Site



Other Towers

FIGURE 11C
Iolehaehae / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

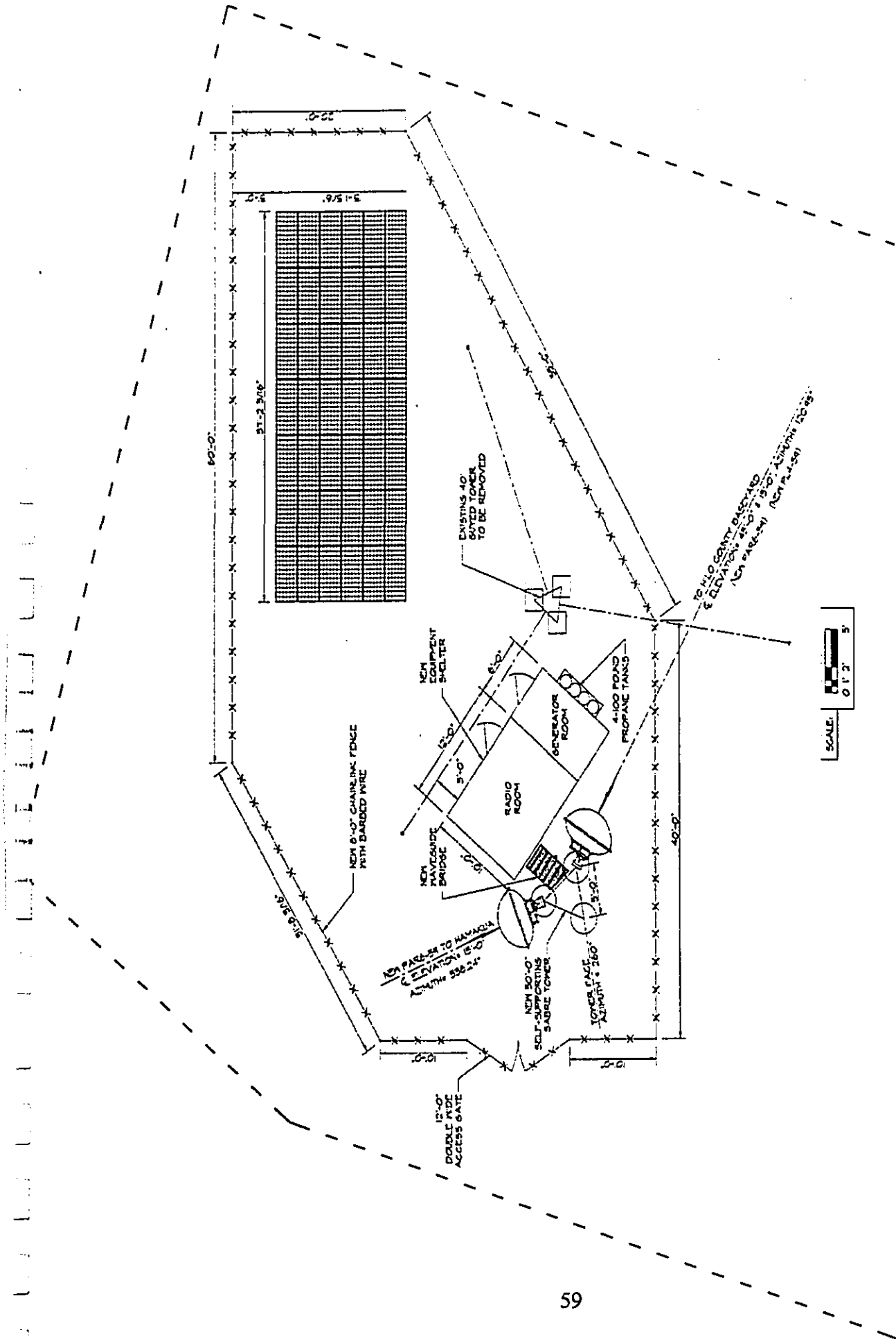


FIGURE 11D
Iolehaehae / Site Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003



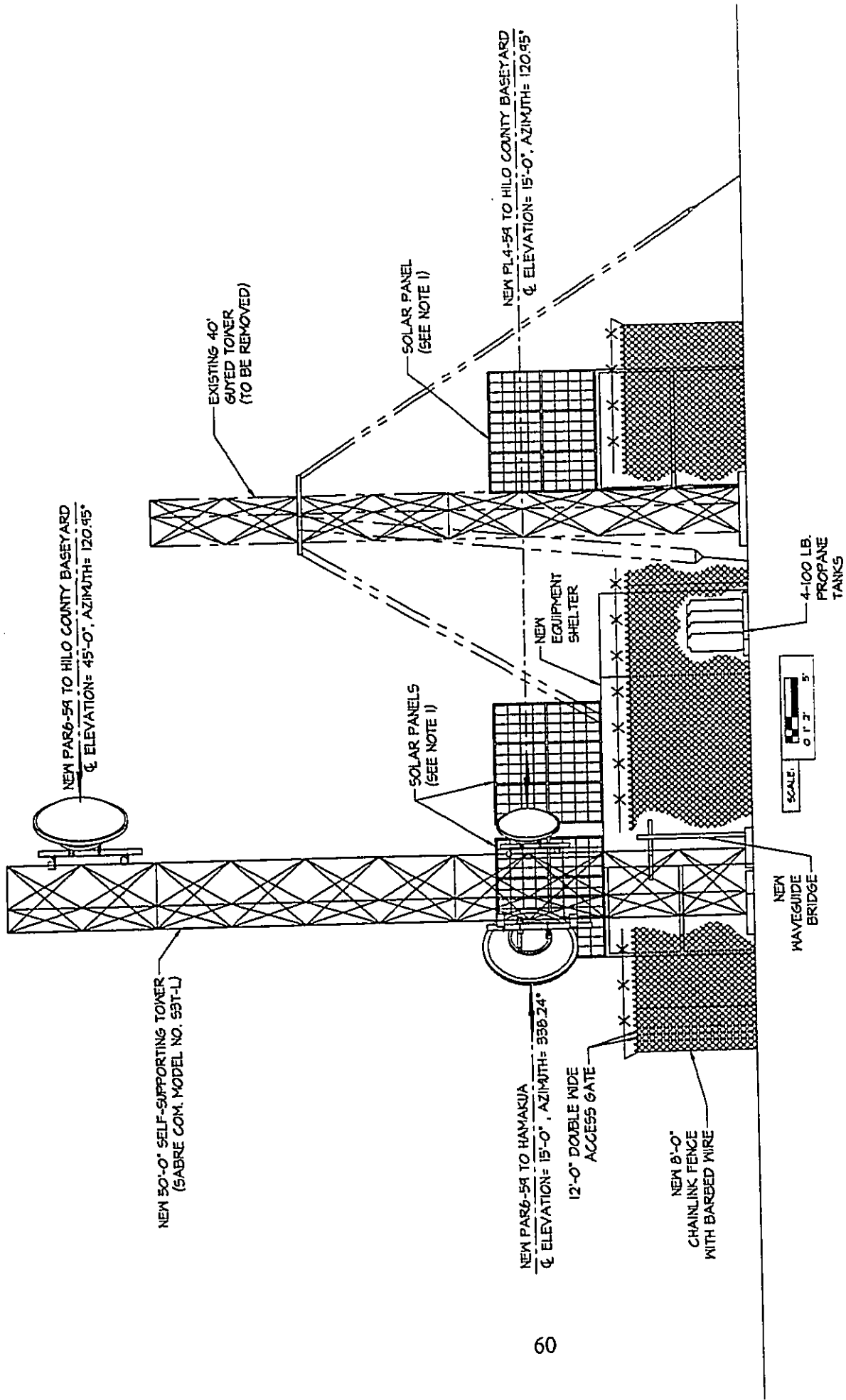


FIGURE 11E
Iolehaehae / Elevation Plan (looking north)
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.7 Kahua Ranch

The facility at Kahua Ranch is a State Department of Accounting and General Services project and is described in a separate Environmental Assessment – *Anuenue (formerly Rainbow) Radio Facilities and Tower, Kahua Ranch Site, North Kohala District, Hawaii* (Wilson Okamoto Corporation, April 2003). Figure 12A shows the site location on the USGS quadrangle map.

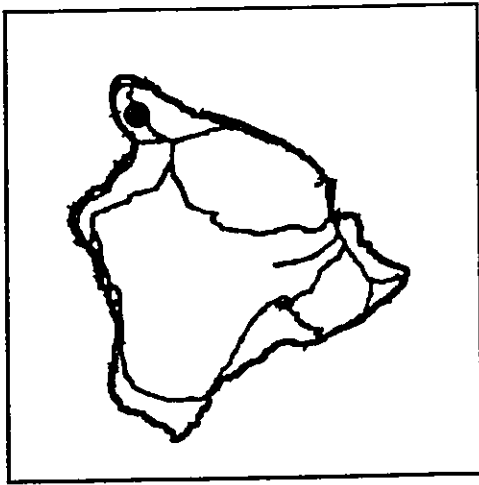
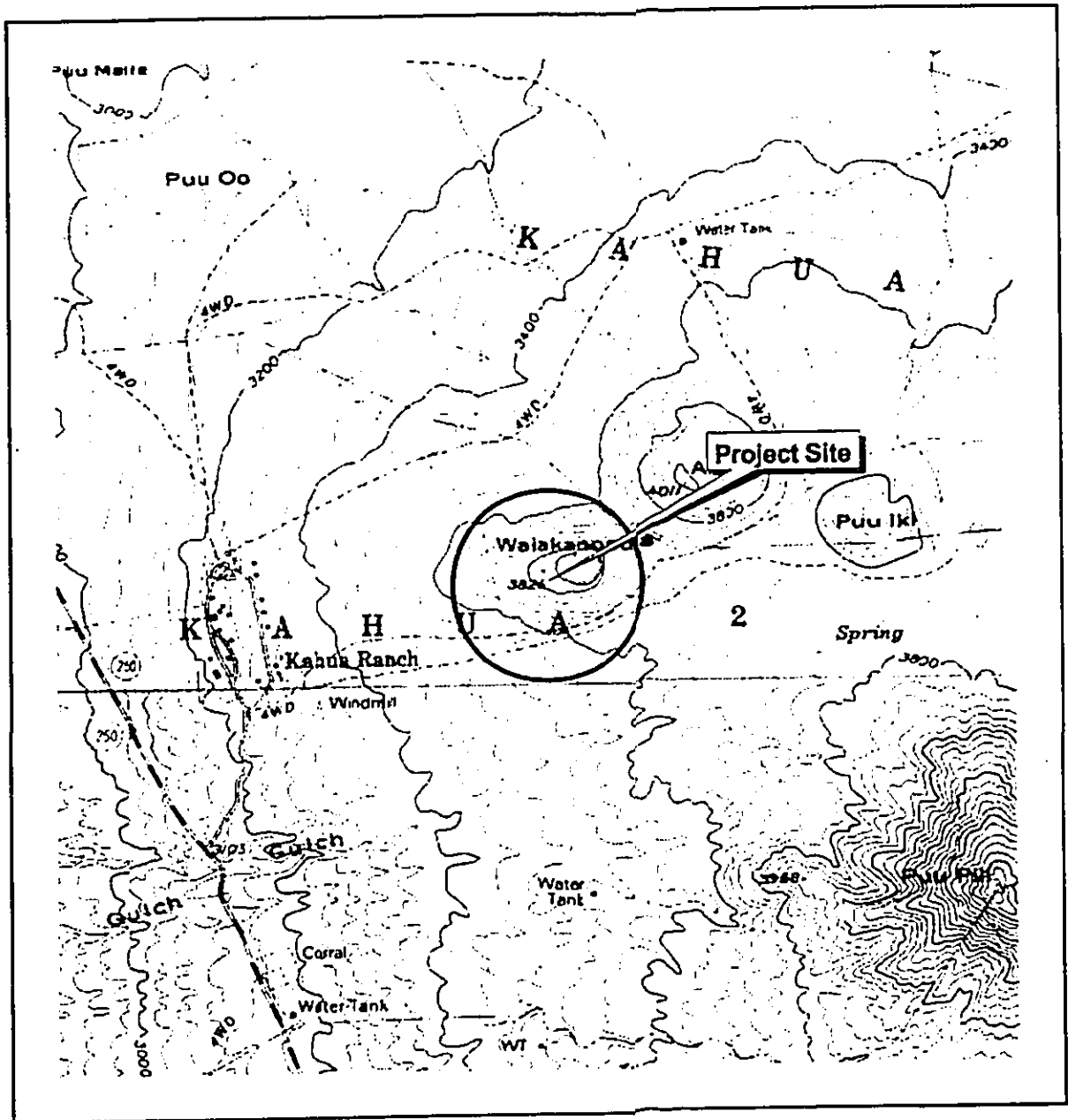
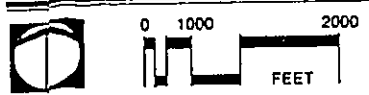


FIGURE 12A
 Kahua Ranch (by DAGS) / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



Source: USGS Hawi Quadrangle

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.8 Kailua Police Station

Location/Access: The Kailua Police Station is located just north of Kailua town, within the ahupuaa of Kealakehe, in the North Kona District. The address is 74-5221 Queen Kaahumanu Highway and the property is identified as TMK 7-4-020:021. Figure 13A shows the site location on the USGS quadrangle map. Figure 13B identifies the site on the TMK map and Figure 13B-1 depicts a boundary plan. Site photographs are provided in Figure 13C.

Existing System. This site is located on the grounds of the recently constructed Kailua Police Station, is part of the backbone and has drops for communication at the police station building. The radio equipment shelter is installed adjacent to the rear fence line and is an older recycled 8 ft x 10 ft prefabricated unit. The tower is a 60-ft self-supporting unit installed about 12 feet from the radio shelter.

Proposed Improvements. An existing concrete block building will house the upgraded communication equipment, existing prefabricated shelter to be removed, no new fuel tank, and no new generator/battery room. It is within the fenced police station compound, thus no new fencing is required.

- New 100-ft self-supporting tower approximately 20 feet east of existing tower
- Three (3) new parabolic antennas
- Refurbish existing room; new digital radio equipment, batteries and charger
- Use existing site generator and fuel tank

Paths. The Kailua Police Station site provides a backbone path south southeast to Ohia Mill via antennas at 95 feet and 65 feet above ground and a backbone path northeast to Moanuaiea via an antenna at 45 feet above ground.

Figures 13D and 13E show the site and elevation plans, respectively.

Co-Locaters. None.

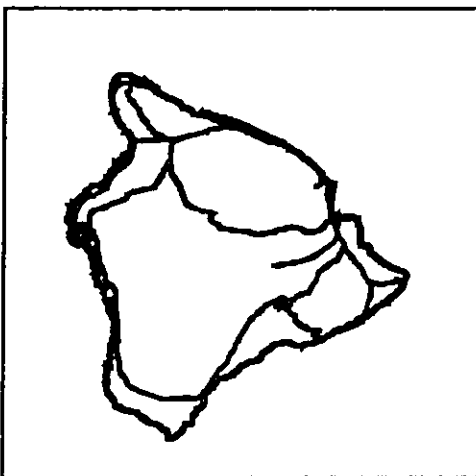
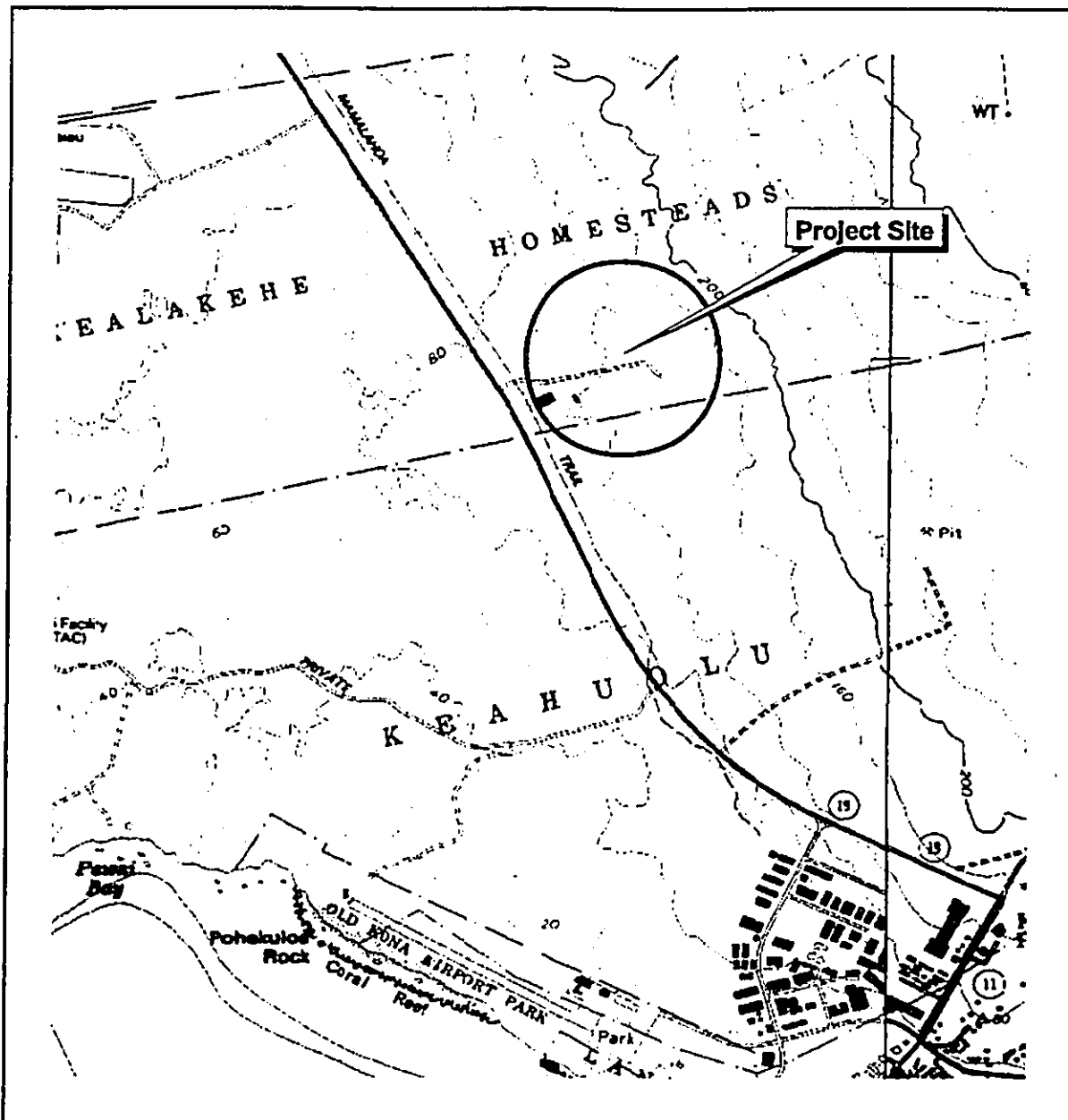
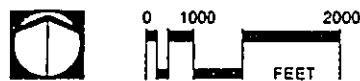


FIGURE 13A
 Kailua Police Station
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



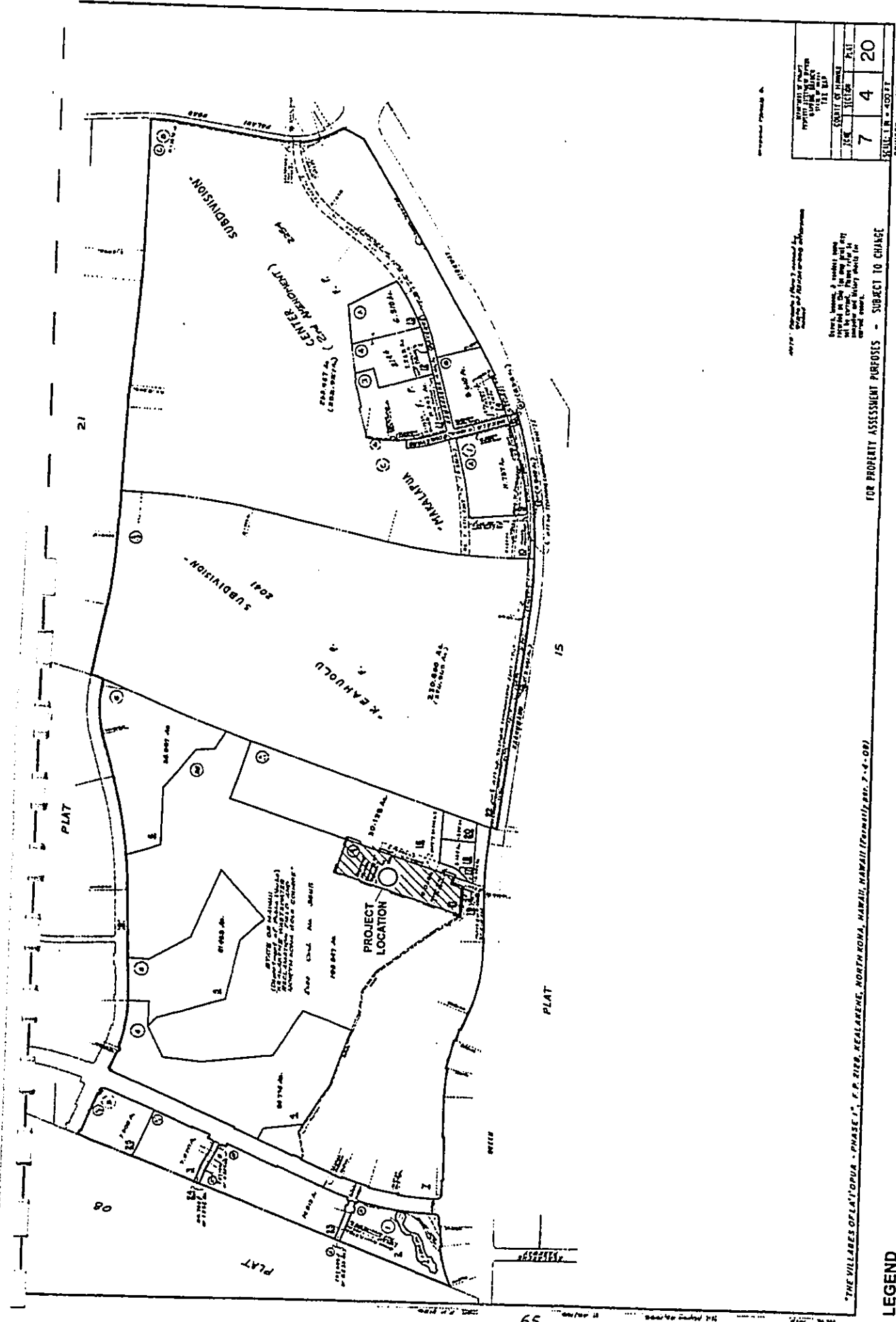
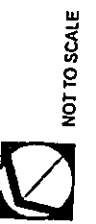


FIGURE 13B
Kailua Police Station / TMK: 7-4-20:21
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003



NOT TO SCALE

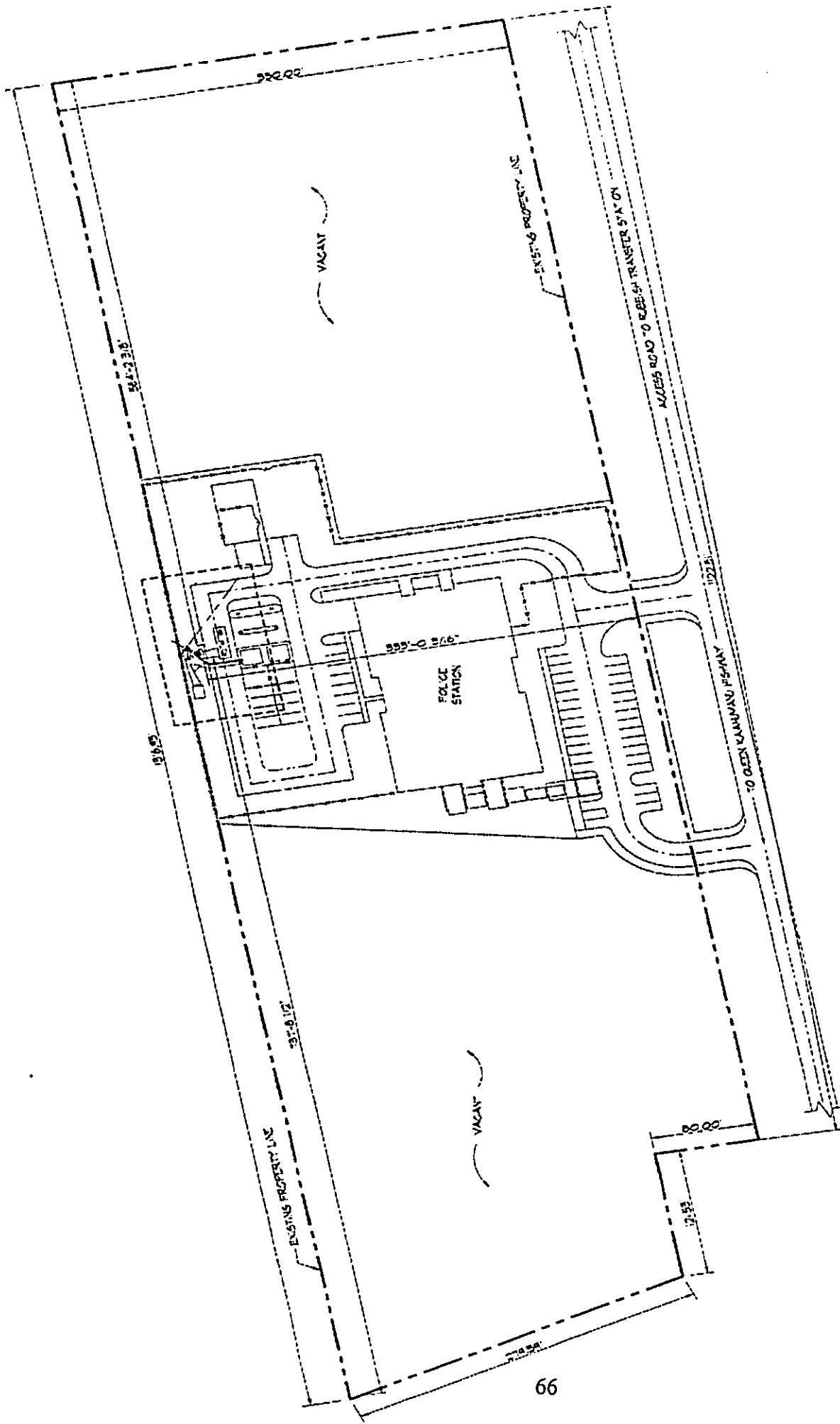
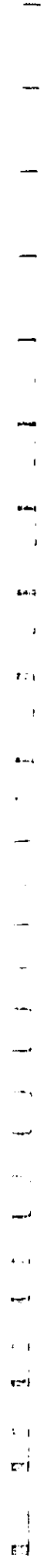
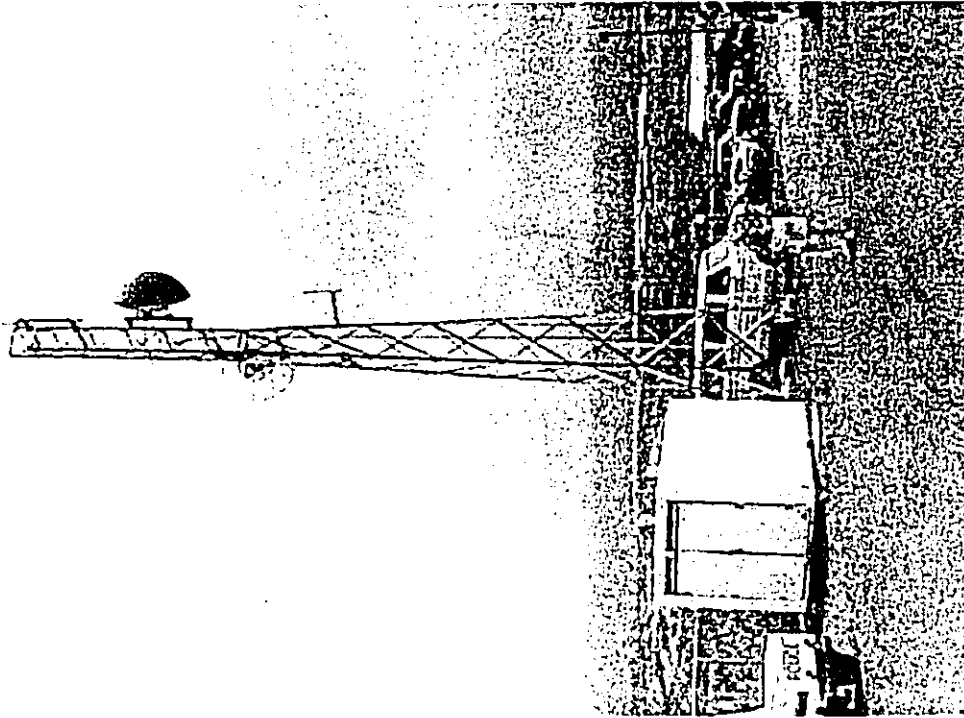
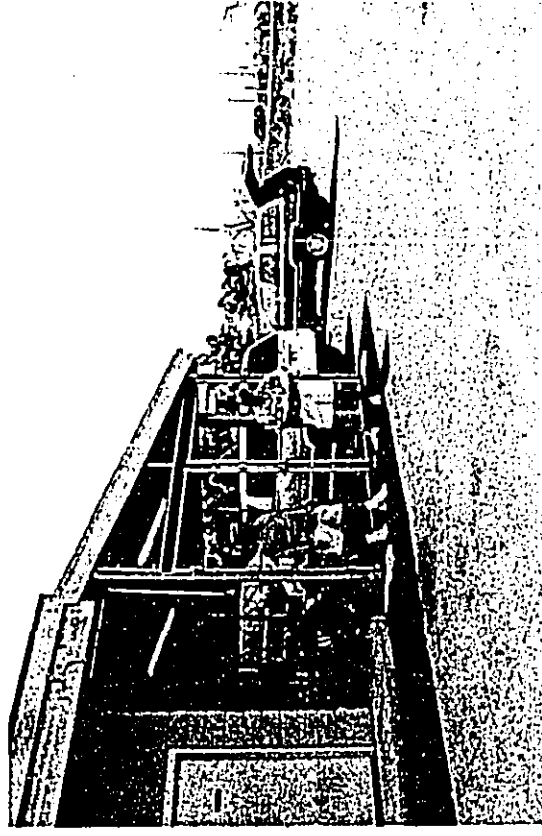
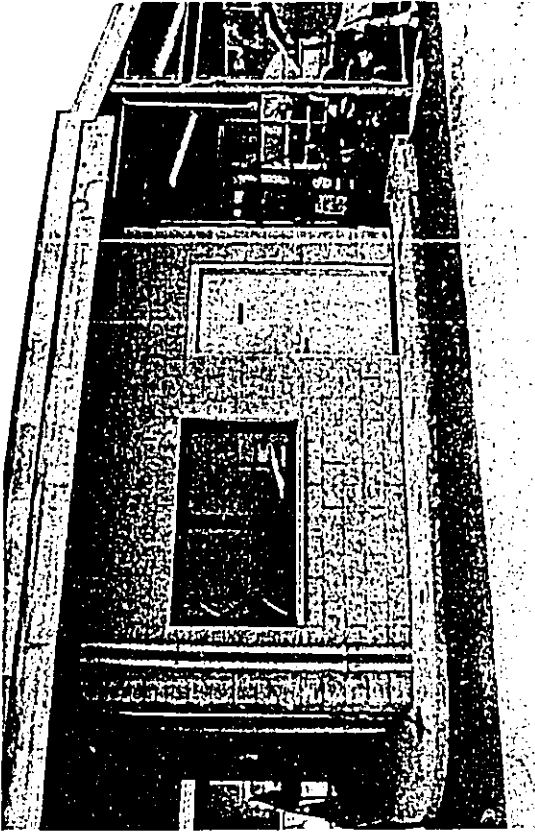


FIGURE 13B-1
Kailua Police Station / Boundary Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES





Replacement Tower Site to the Right of Existing Tower

FIGURE 13C
Kailua Police Station / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

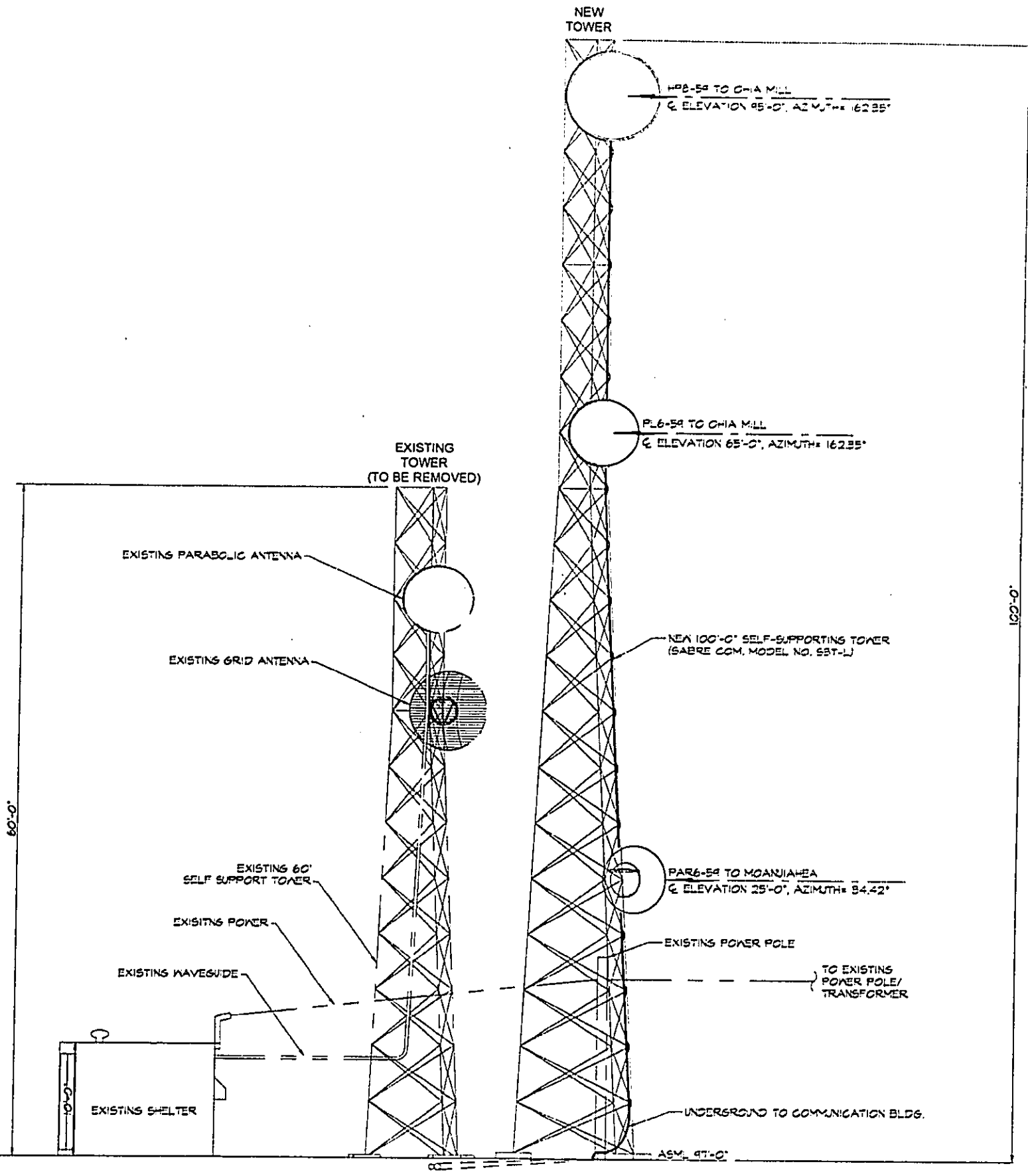


FIGURE 13E
 Kailua Police Station / Elevation Plan (looking north)
 COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.9 Kamehameha Park

Location/Access. The radio facility is at Kamehameha Park in the town of Kapaau, within the ahupuaa of Honopueo, in the North Kohala district. The site of the existing and proposed radio facilities is adjacent to the Hisaoka Gymnasium within the community park facility. Access is from Akoni Pule Highway (Highway 270) and Kamehameha Park Road. The property is identified as TMK5-4-009:004. Figure 14A shows the site location on the USGS quadrangle map. Figure 14B identifies the site on the TMK map and Figure 14B-1 depicts a boundary plan. Site photographs are provided in Figure 14C.

Existing System. The Kamehameha Park radio facility is located on the grounds of the County park and adjacent (to the west) of the main gymnasium building. The radio equipment building is an 8 ft x 10 ft prefabricated fiberglass building. The microwave antennas are installed on a 110-ft monopole located adjacent to the radio building. The facilities are enclosed within a 14 ft x 30 ft fence.

Proposed Improvements. The new facility will be adjacent to the south of the existing facility. The improvements include the following:

- New 140-ft monopole tower
- Three (3) new parabolic antennas
- New shelter to house digital radio equipment, batteries and charger
- New generator and propane tank
- New 10-ft high chain link fence; no barbed wire (approx. 20 ft x 37 ft)

Paths. Kamehameha Park provides a backbone path south to Kahua Ranch via a antenna 113 feet above ground and a backbone path southeast to Hamakua Police Station via antennas at 135 feet and 105 feet above ground.

Figures 14D and 14E show the site and elevation plans, respectively.

Co-Locaters. None.

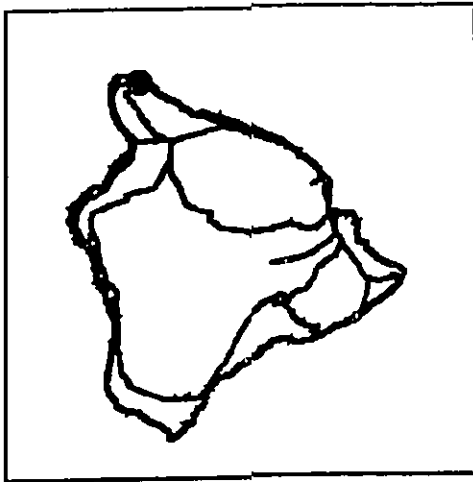
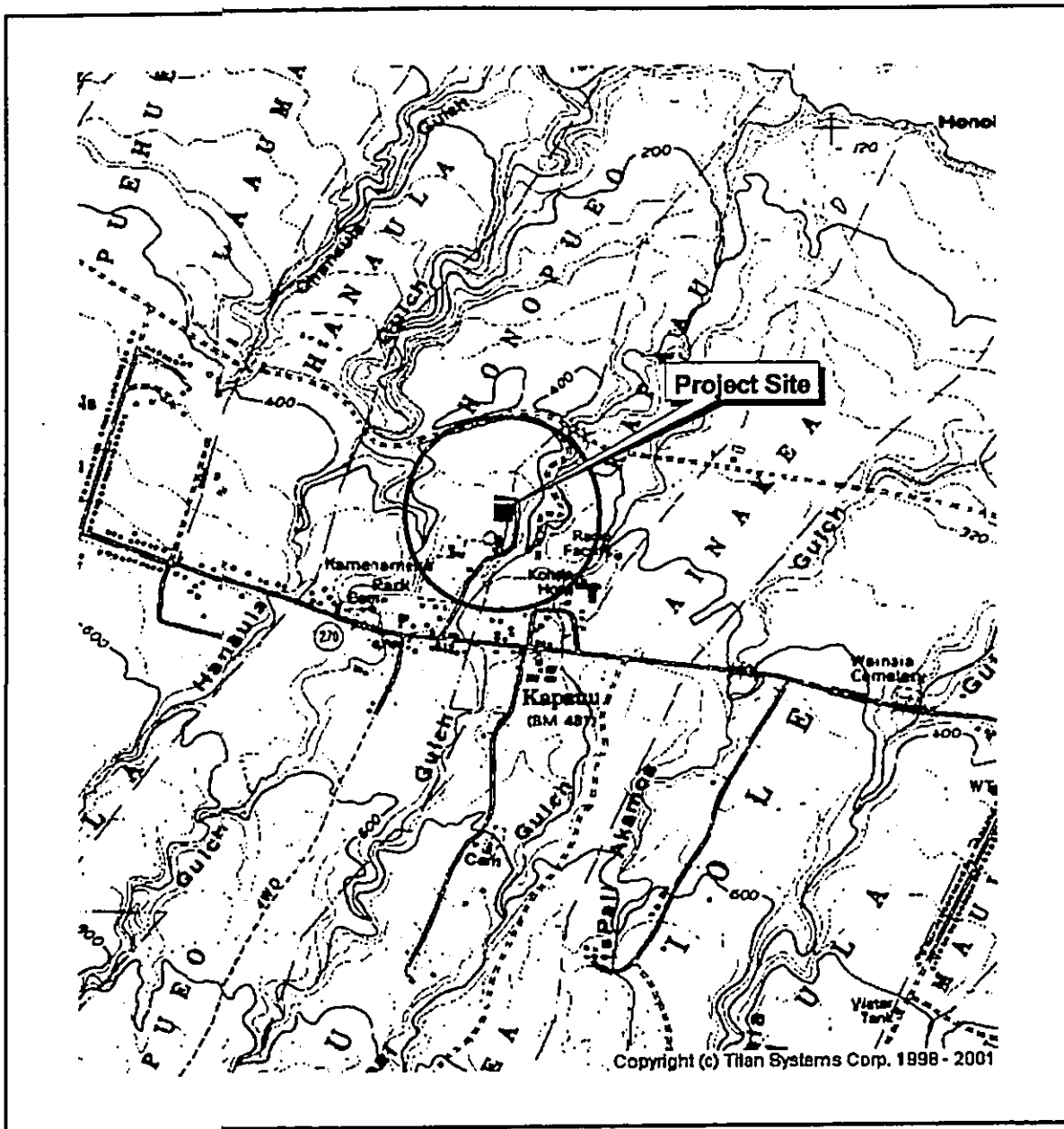
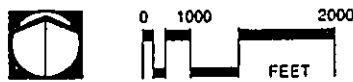
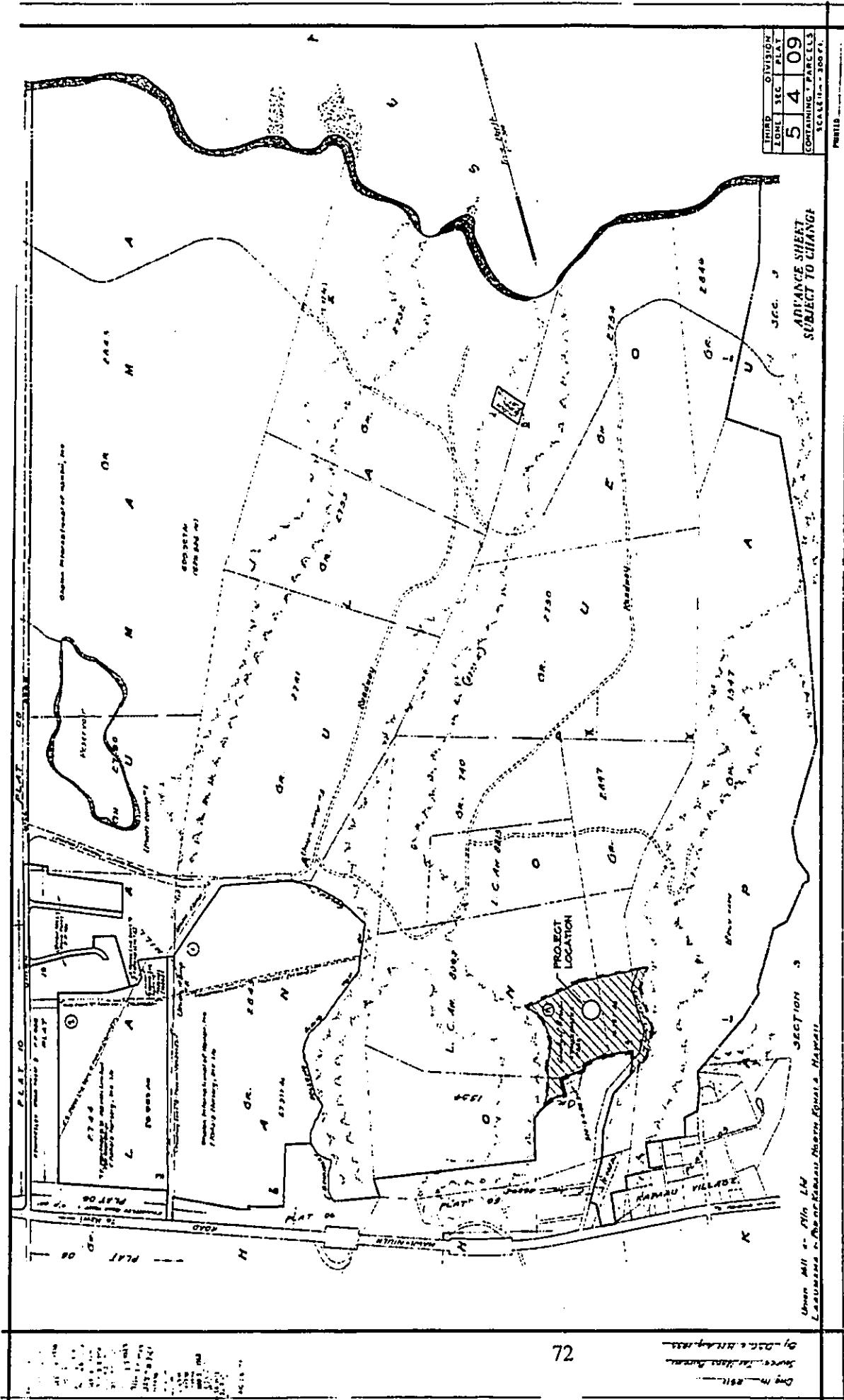


FIGURE 14A
 Kamehameha Park / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES

Source: USGS Hawi Quadrangle





LEGEND

 = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR

 = PROJECT LOCATION

FIGURE 14B
Kamehameha Park / TMK: 5-4-09:04
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

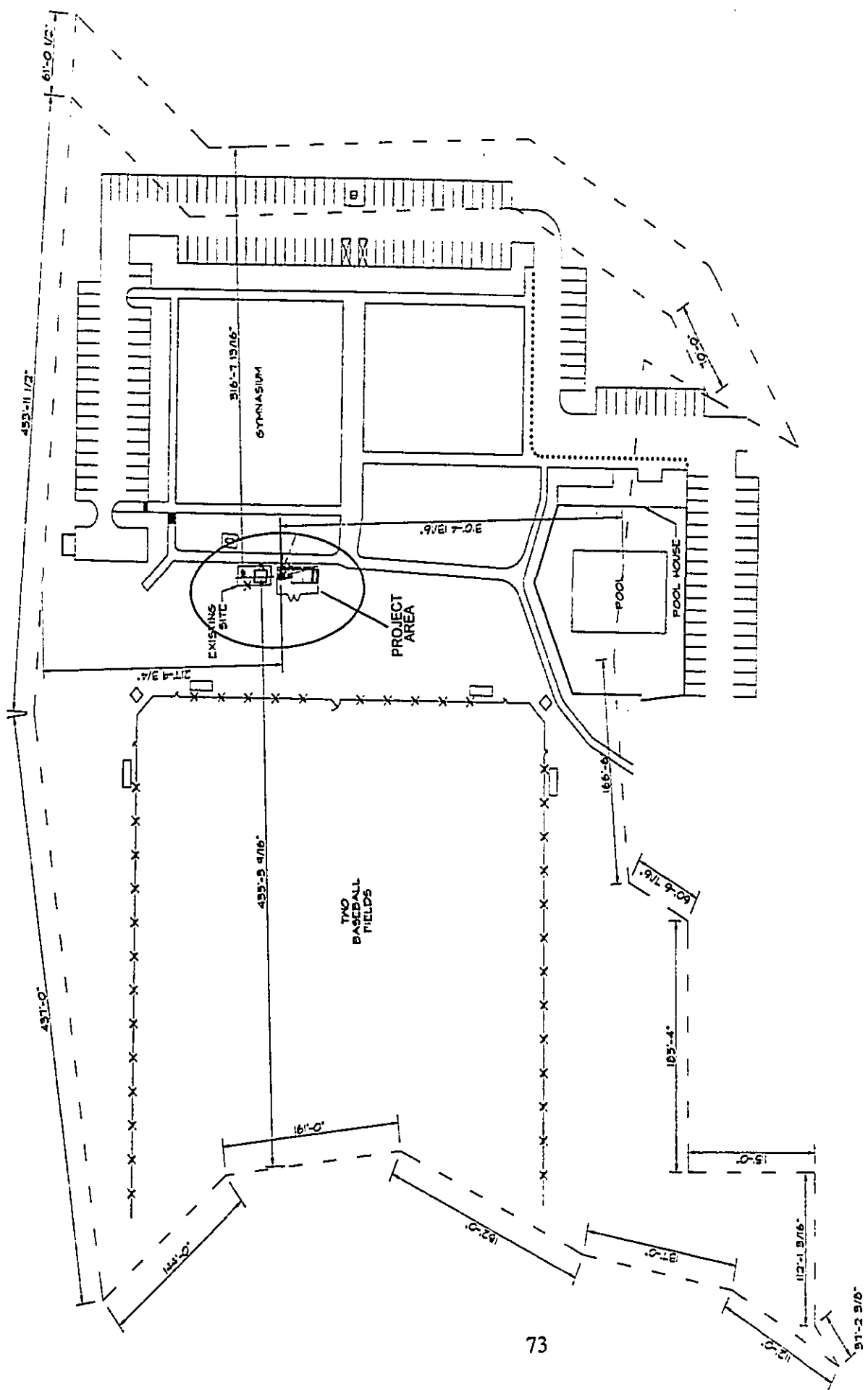


NOT TO SCALE



June 2003

Source: Scientel America, Inc.



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FIGURE 14B-1
Kamehameha Park / Boundary Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



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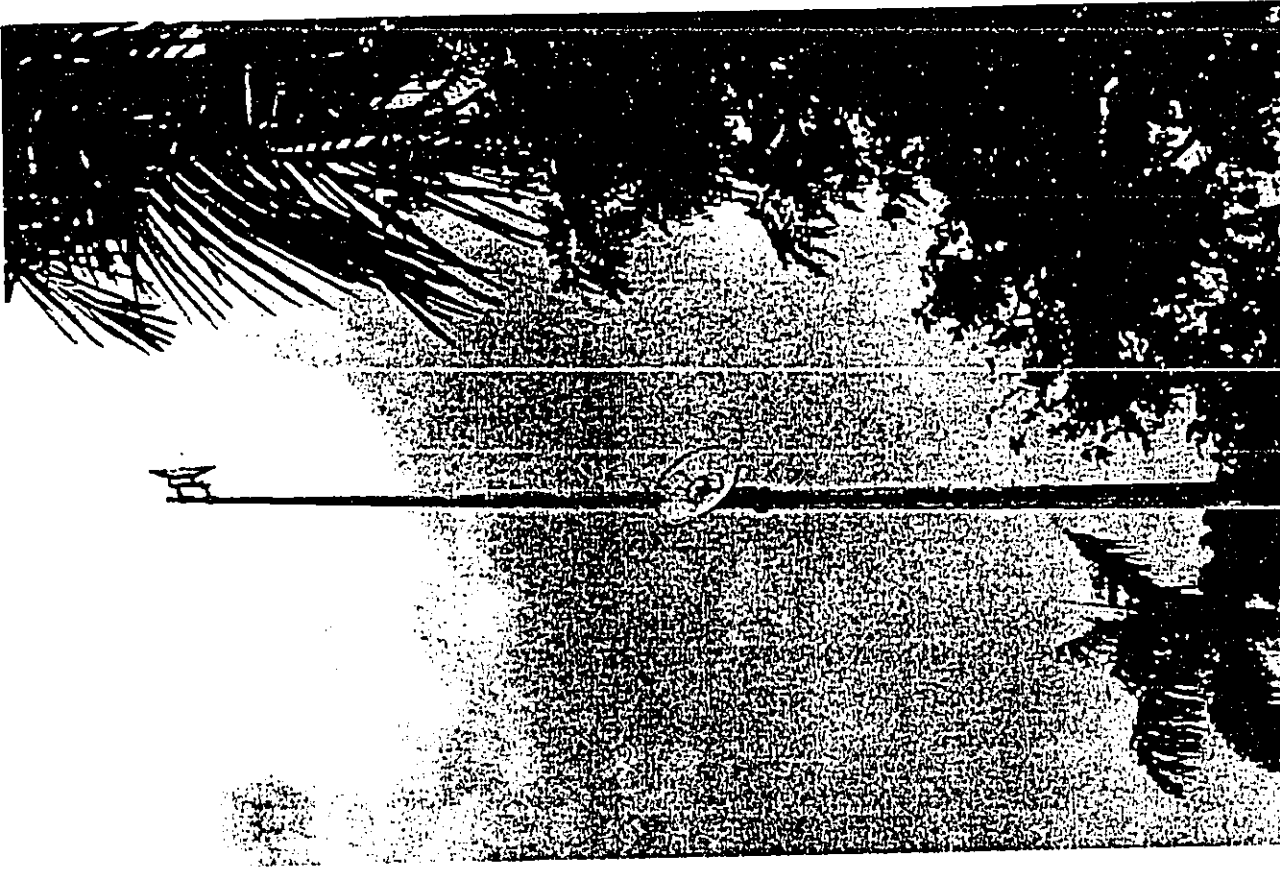
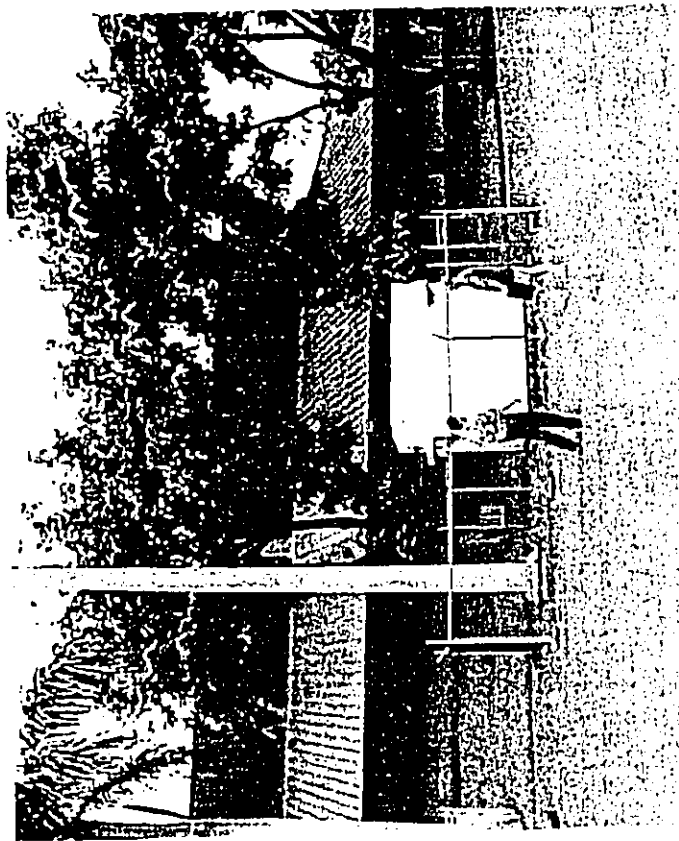
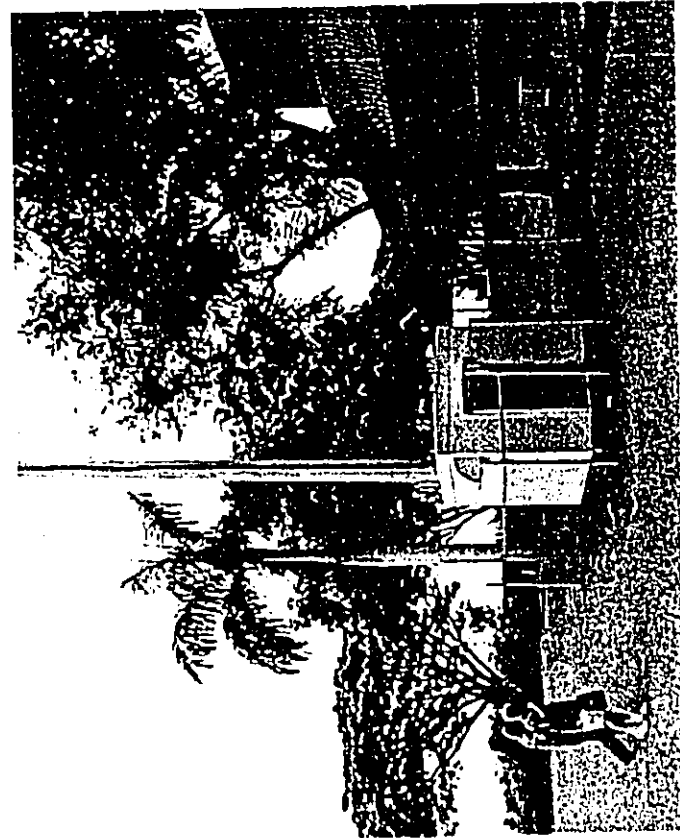


FIGURE 14C
 Kamehameha Park/ Site Photos
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



Replacement Tower Site to the Right of Existing Tower



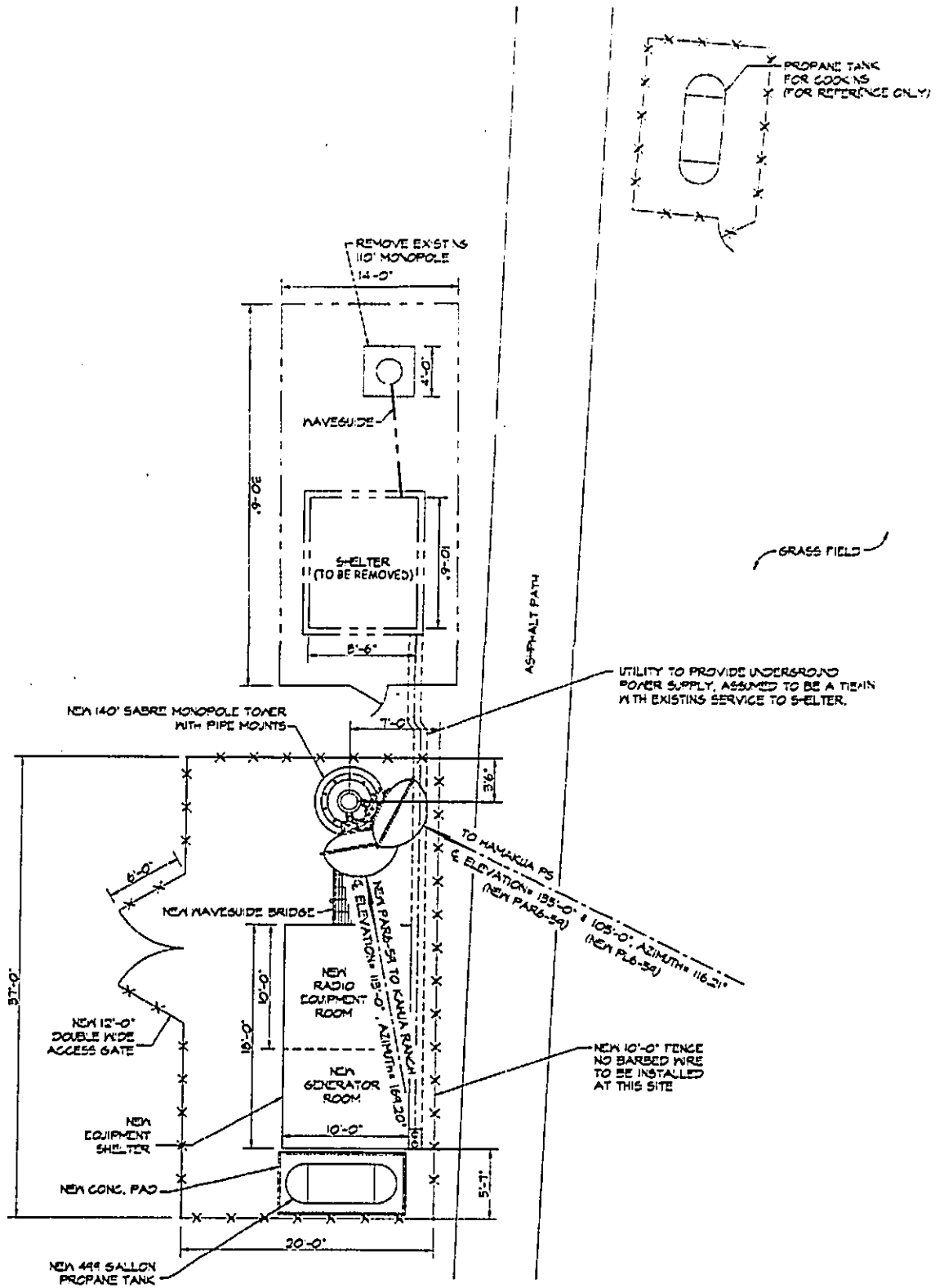


FIGURE 14D
Kamehameha Park / Site Plan

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



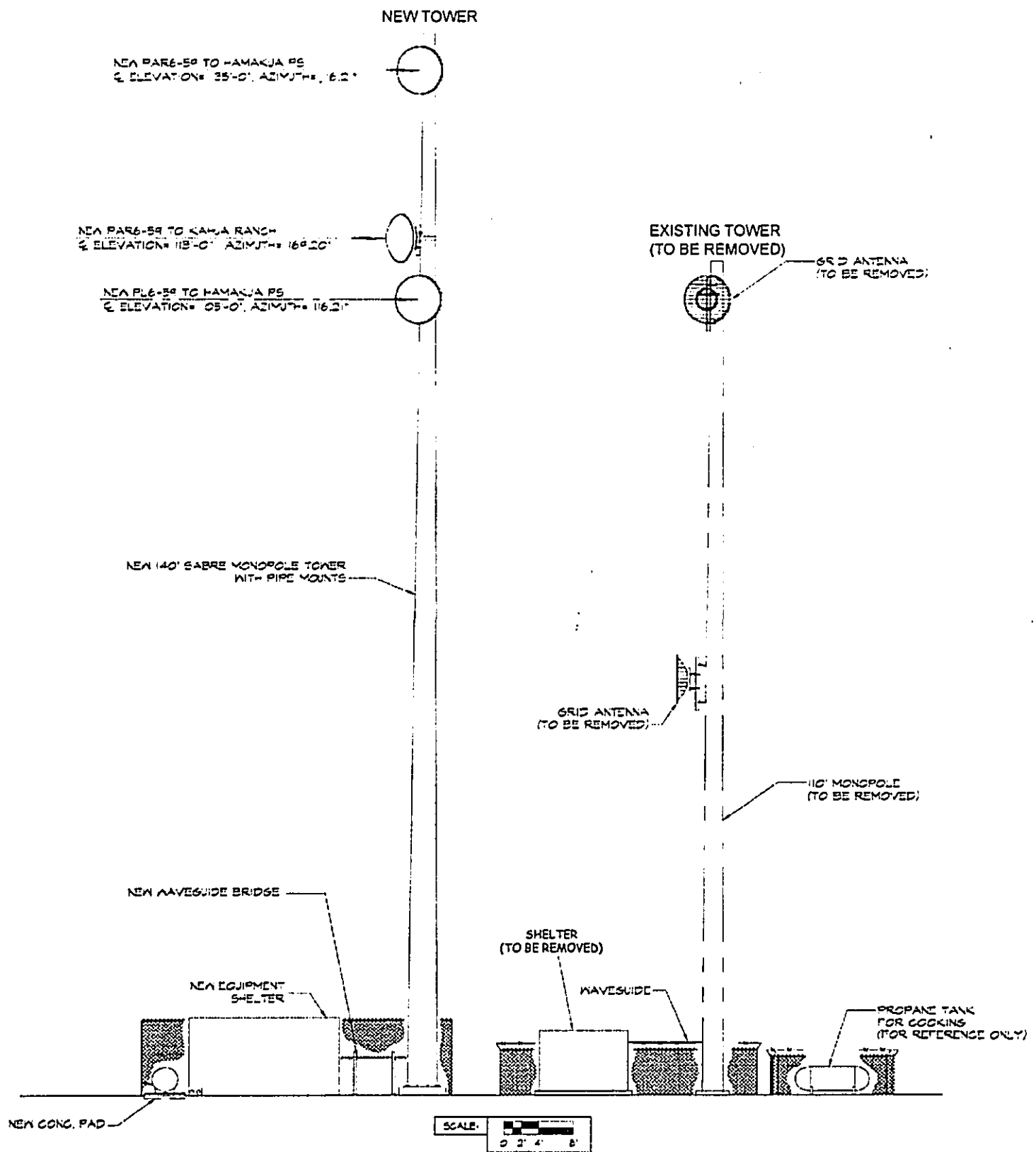


FIGURE 14E
Kamehameha Park / Elevation Plan (looking west)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.10 Kau Police Station

Location/Access. The Kau Police Station is located approximately 1 mile east of Naalehu town on Mamalahoa Highway in the Kaunamano land division in the Kau district. The site of the new radio facilities is located at the rear parking lot of the property. Access is from Mamalahoa Highway (Highway 11). The property is identified as TMK9-5-012:037. Figure 15A shows the site location on the USGS quadrangle map. Figure 15B identifies the site on the TMK map and 15B-1 depicts a boundary plan. Site photographs are provided in Figure 15C.

Existing System. The Kau Police Station was constructed in 1997 with plans for a new radio system. A radio room was included in the original construction, but the site has no tower or antennas.

Proposed Improvements. The following will be constructed in the back yard of the police station:

- New 90-ft self-supporting tower
- One (1) new parabolic antenna
- Use existing radio room in police building; new digital radio equipment, new batteries and charger
- Use existing site generator and fuel tank.
- New 8 ft high chain link fence (approx. 25 ft x 25 ft)

Path. The Kau Police Station is a spur site with a path to/from Naalehu Pasture located approximately 2 miles southwest via an antenna at 85 feet above ground.

Figures 15D and 15E show the site and elevation plans, respectively.

Co-Locater. None

2.7.11 Kau State Building (Demolition Site)

Location/Access. The radio facility at the Kau State Building will be demolished after the new Kau Police Station facility is in operation. The property is identified as TMK 9-5-021:010 and is located on Mamalahoa Highway in Naalehu.

Existing System. The Kau State Building site is located at the State Civic Center in Naalehu. It is a terminal site that serves the Kau Police Station which connects by leased telephone company wire line. The microwave equipment is installed in an 8 ft X 10 ft room (old jail cell) at the back of the civic center building. The 50 ft tower is installed further back near the library building and is approximately 100 feet to 125 feet from the microwave radio equipment.

This site will be replaced by the Kau Police Station facilities and will be removed after the new police station facilities are tested and approved.

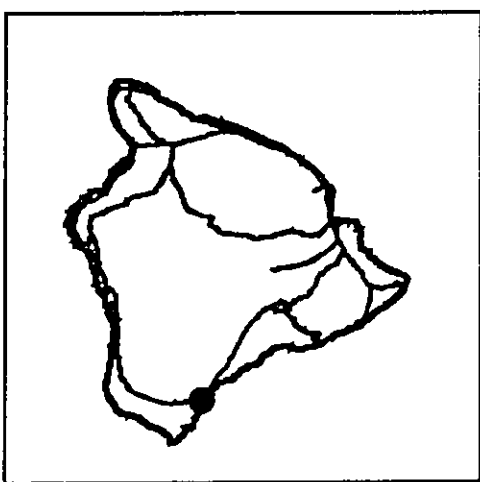
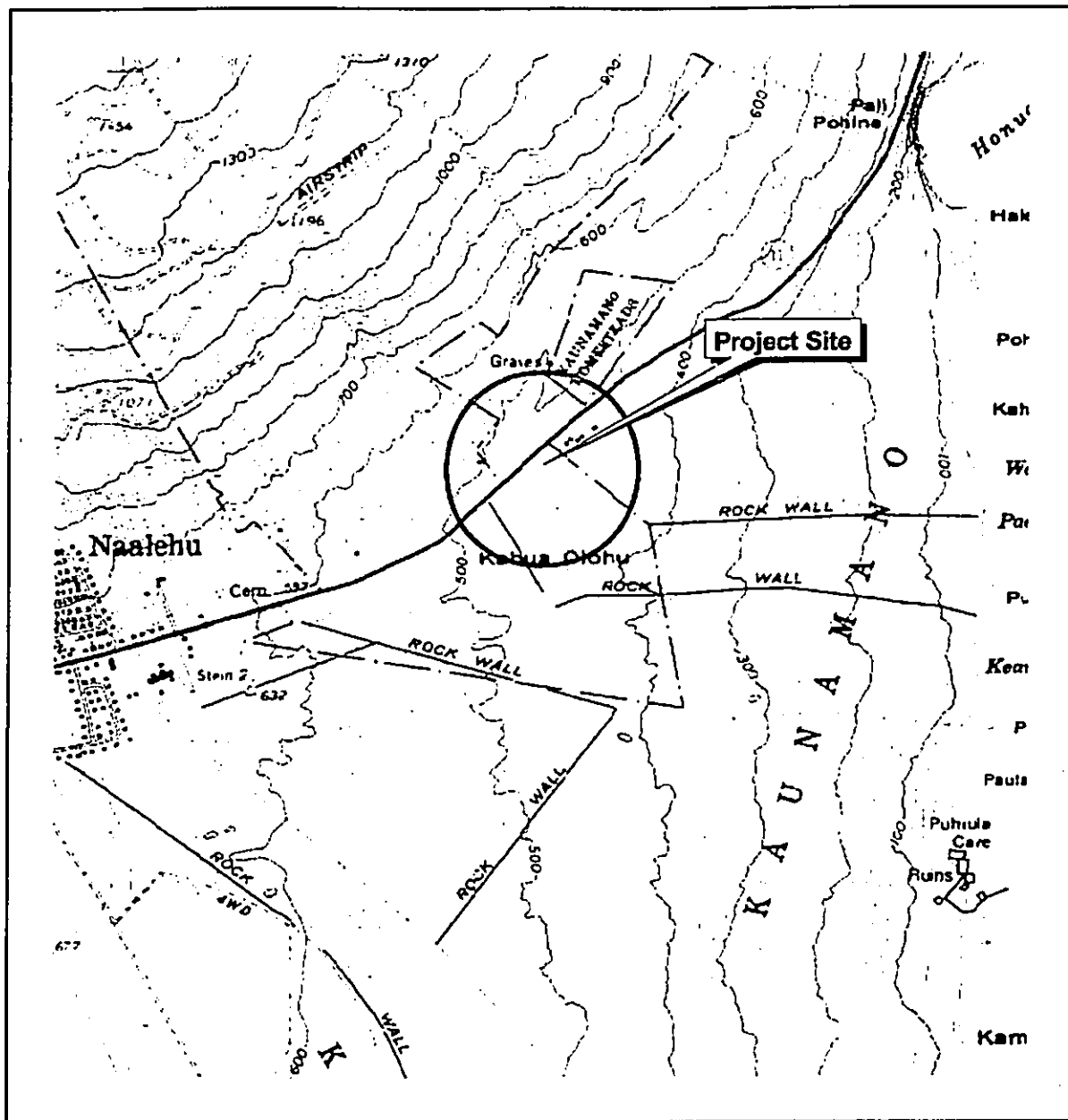


FIGURE 15A
 Kau Police Station / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES

Source: USGS Naalehu Quadrangle



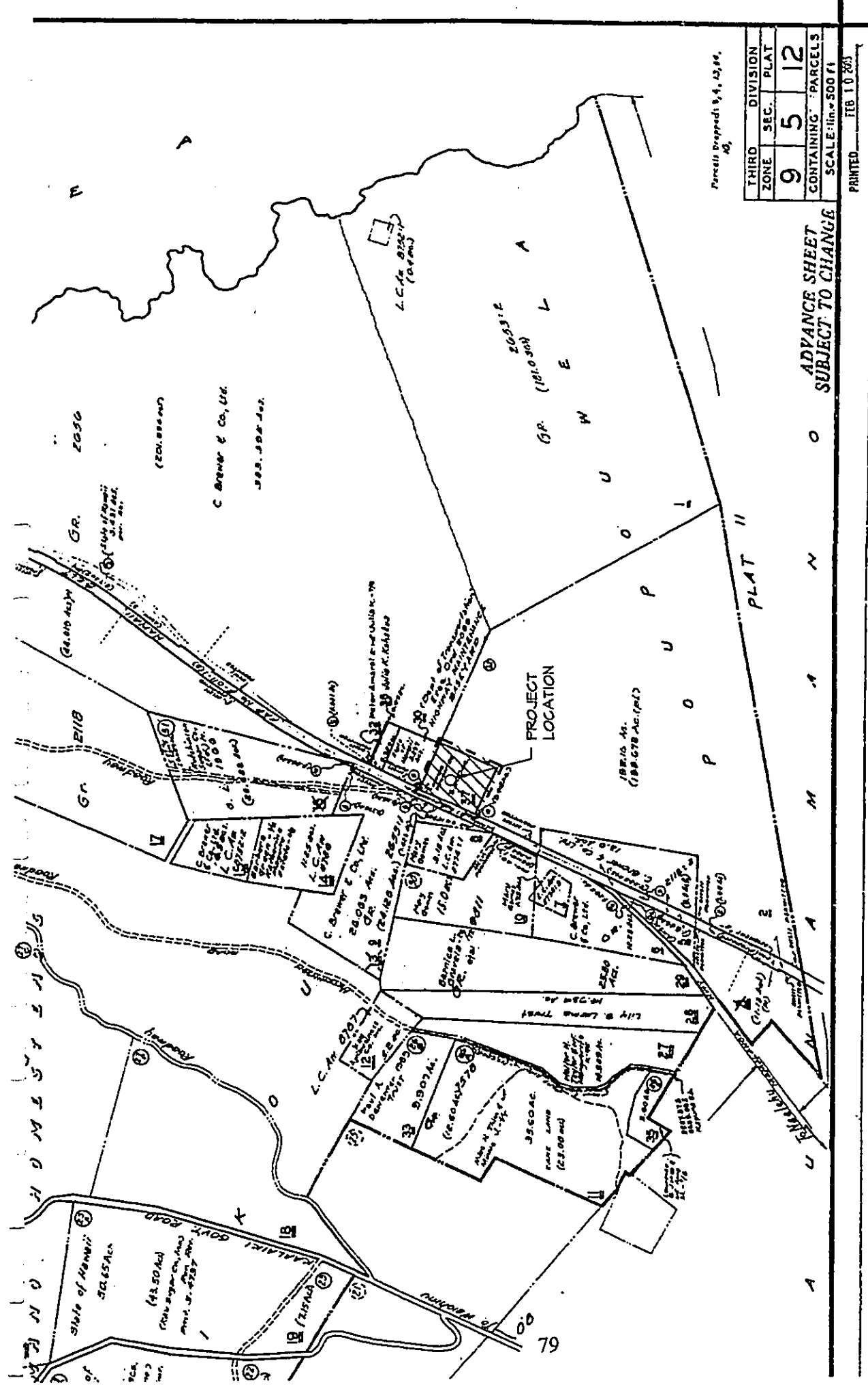




FIGURE 15B
Kau Police Station / TMK: 9-5-12:37
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

LEGEND

 = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR

 = PROJECT LOCATION

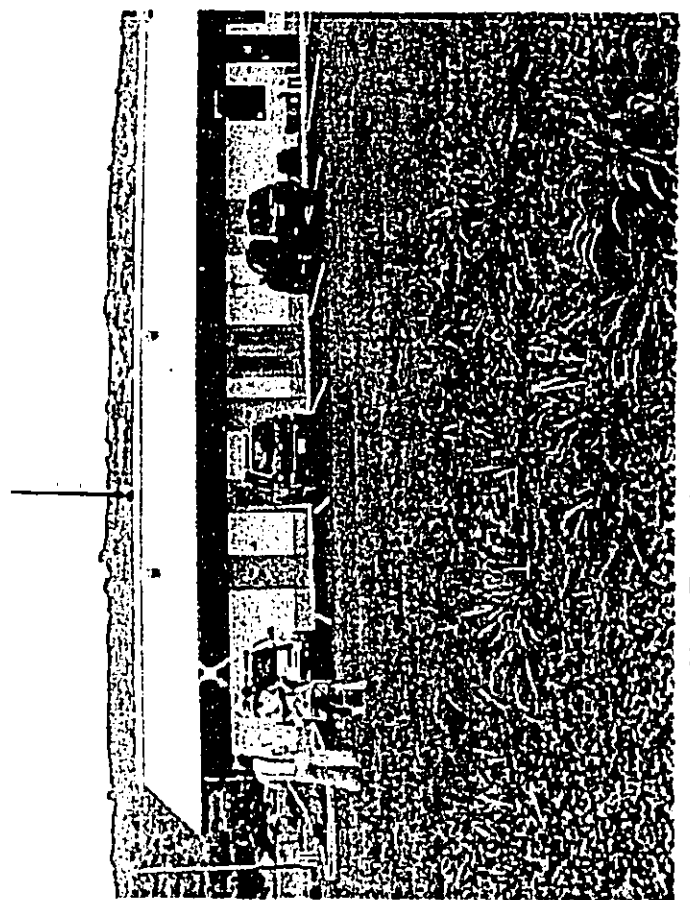
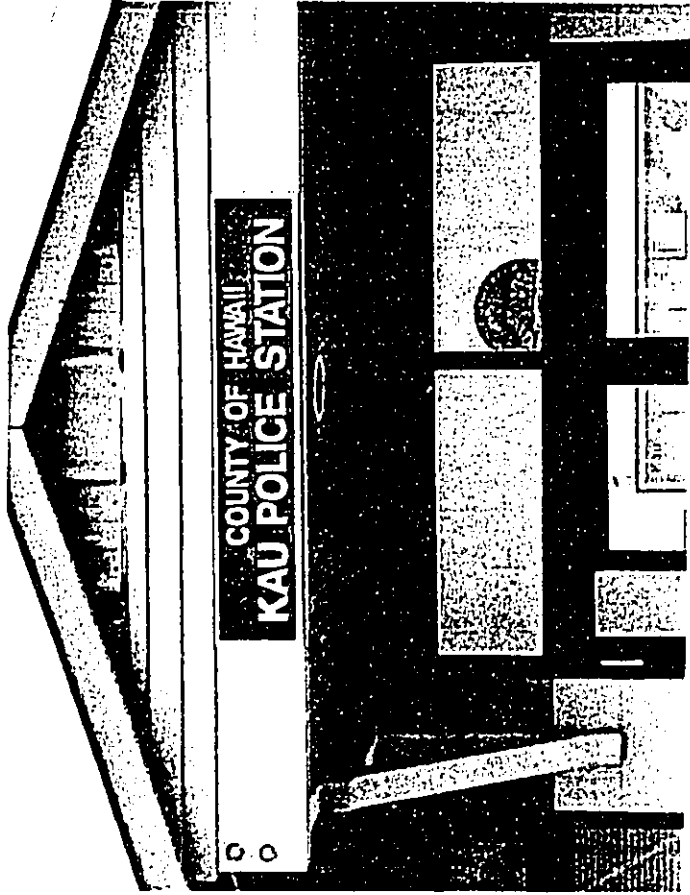


June 2003



NOT TO SCALE

Source: County of Hawaii Tax Map Key



New Tower Location

FIGURE 15C
Kau Police Station/ Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

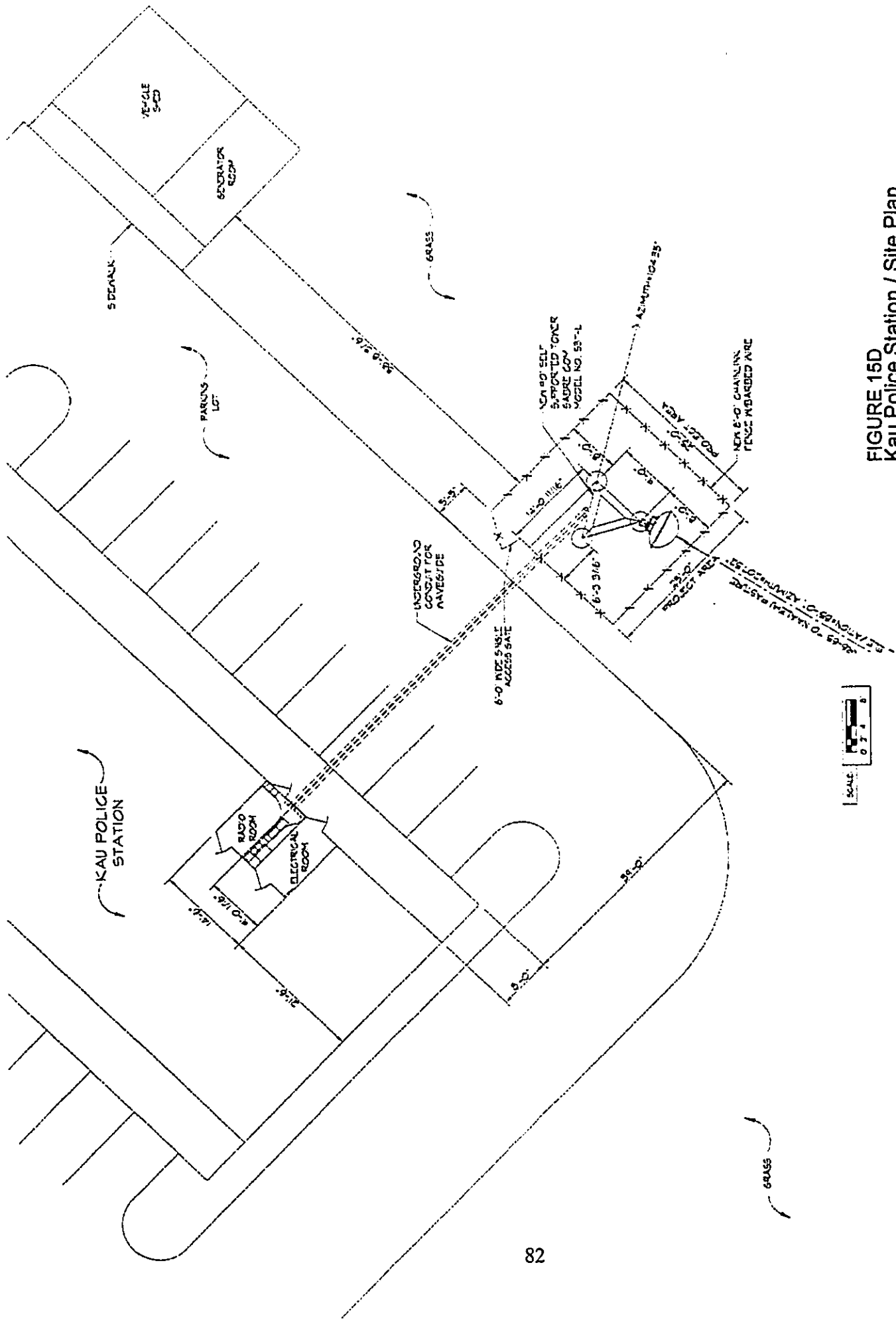


FIGURE 15D
Kau Police Station / Site Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003



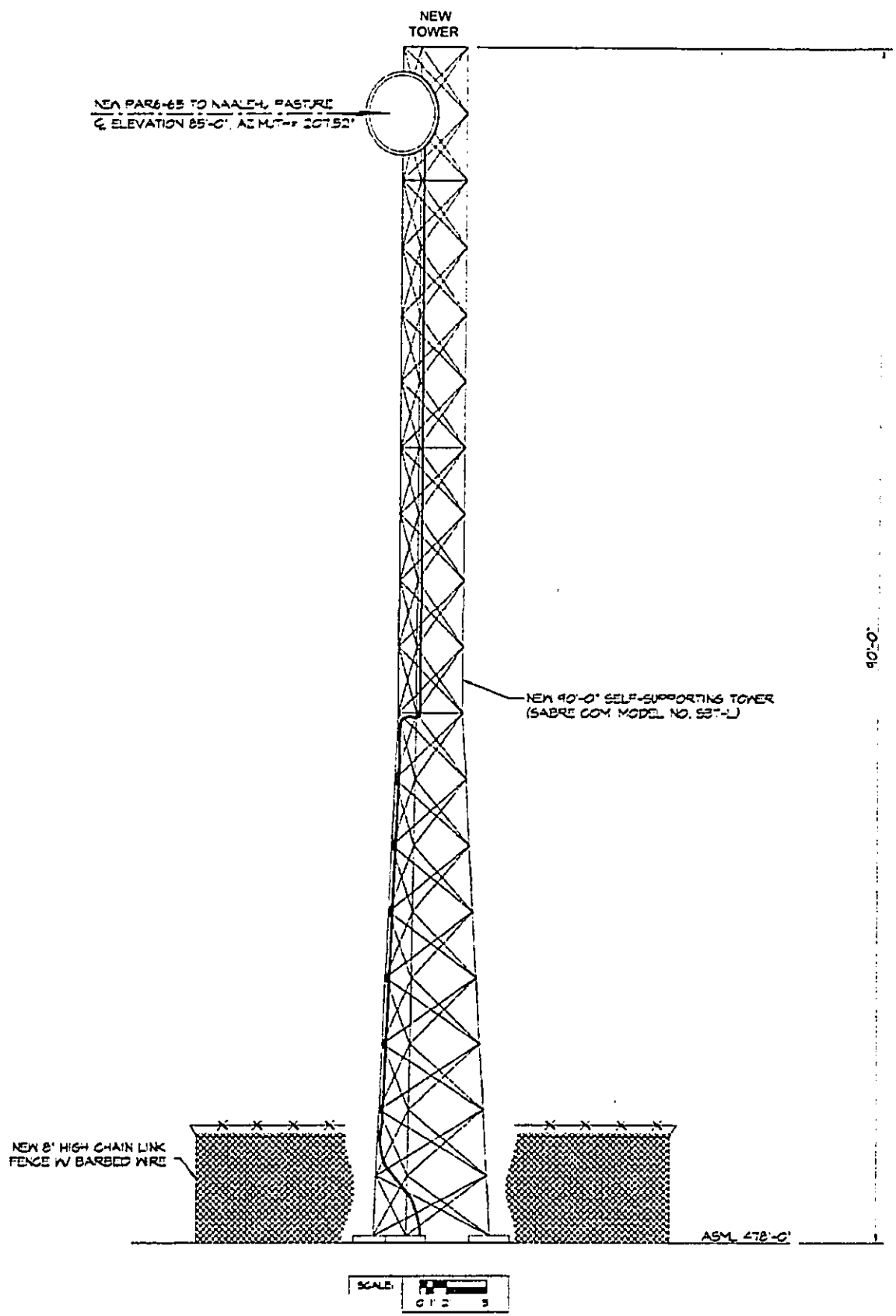


FIGURE 15E
 Kau Police Station / Elevation Plan (looking north)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.12 Kauna Point

Location/Access. Although this site is named Kauna Point, the facility is approximately 1 mile northeast of Kauna Point and is more accurately described as being inland of Kaiakēkua within the Manuka State Park. Access to the site is from Mamalahoa Highway through a 4-wheel drive road to the shoreline and along a rough jeep road that travels south and parallel to the coastline. The project site is located on an aa lava flow at elevation 100 feet above mean sea level. The property is identified as TMK 9-1-001:003. Figure 16A shows the site location on the USGS quadrangle map. Figure 16B identifies the site on the TMK map. Site photographs are provided in Figure 16C.

Existing System. This is a solar-powered site that was constructed as part of the looped microwave system. The radio shelter is an 8- ft x 10-ft prefabricated fiberglass unit. The existing self-supporting tower is 160 ft tall and is located adjacent to the shelter. This site is used as a microwave repeater site only to connect Ohia Mill with South Point as part of the looped system. There are no multiplex drops at the site.

Proposed Improvements. Preliminary test results indicate that the existing tower structure is insufficient and will require refurbishing or replacement. Subsequent testing will be performed to confirm the results. If a new tower were required it would be located adjacent to the presently existing tower.

- Refurbish 160 ft self supporting tower
- Two (2) new parabolic antennas
- Refurbish existing shelter; new digital radio equipment, new batteries and charger
- New generator and propane bottles
- New solar panels
- New 10-ft chain link fence (approx. 30 ft x 30 ft)

Paths. The Kauna Point site provides a repeater path north to Ohia Mill via an antenna at 147 feet above ground and a repeater path east to South Point via an antenna at 114 feet above ground.

Figures 16D and 16E show the site and elevation plans, respectively.

Co-Locater. None.

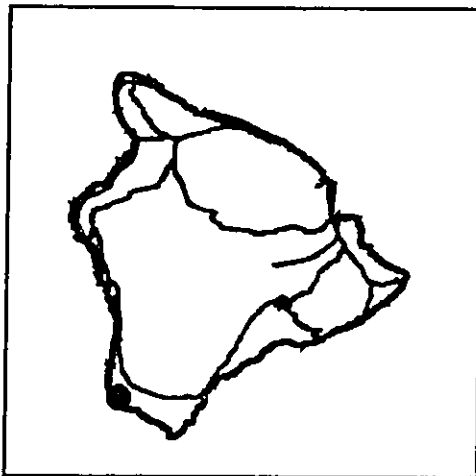
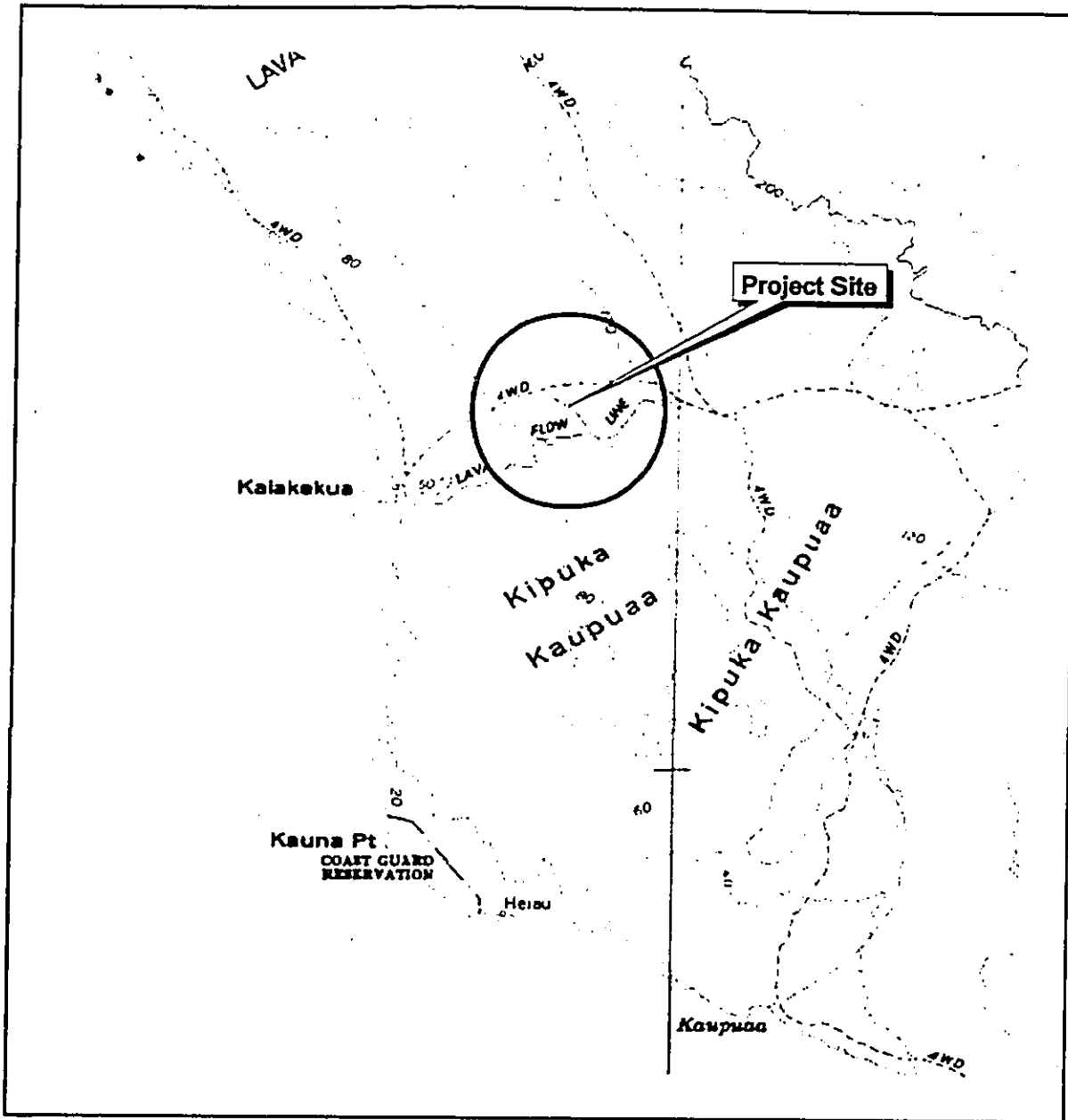
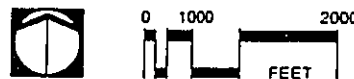


FIGURE 16A
 Kauna Point / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



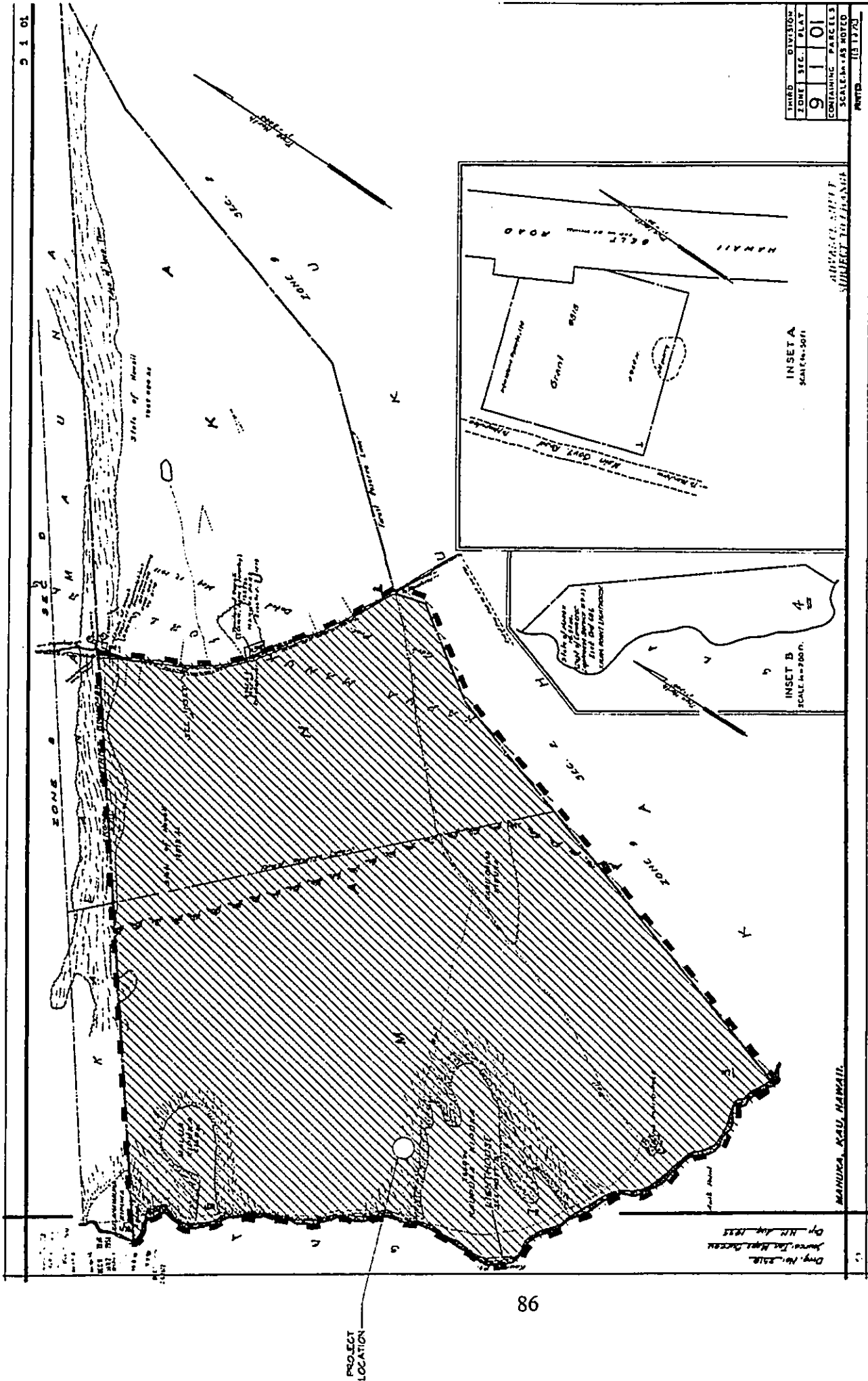




FIGURE 16B
Kauna Point / TMK: 9-1-01:03
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003



NOT TO SCALE

- LEGEND**
-  = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR
 -  = PROJECT LOCATION

Source: County of Hawaii Tax Map Key

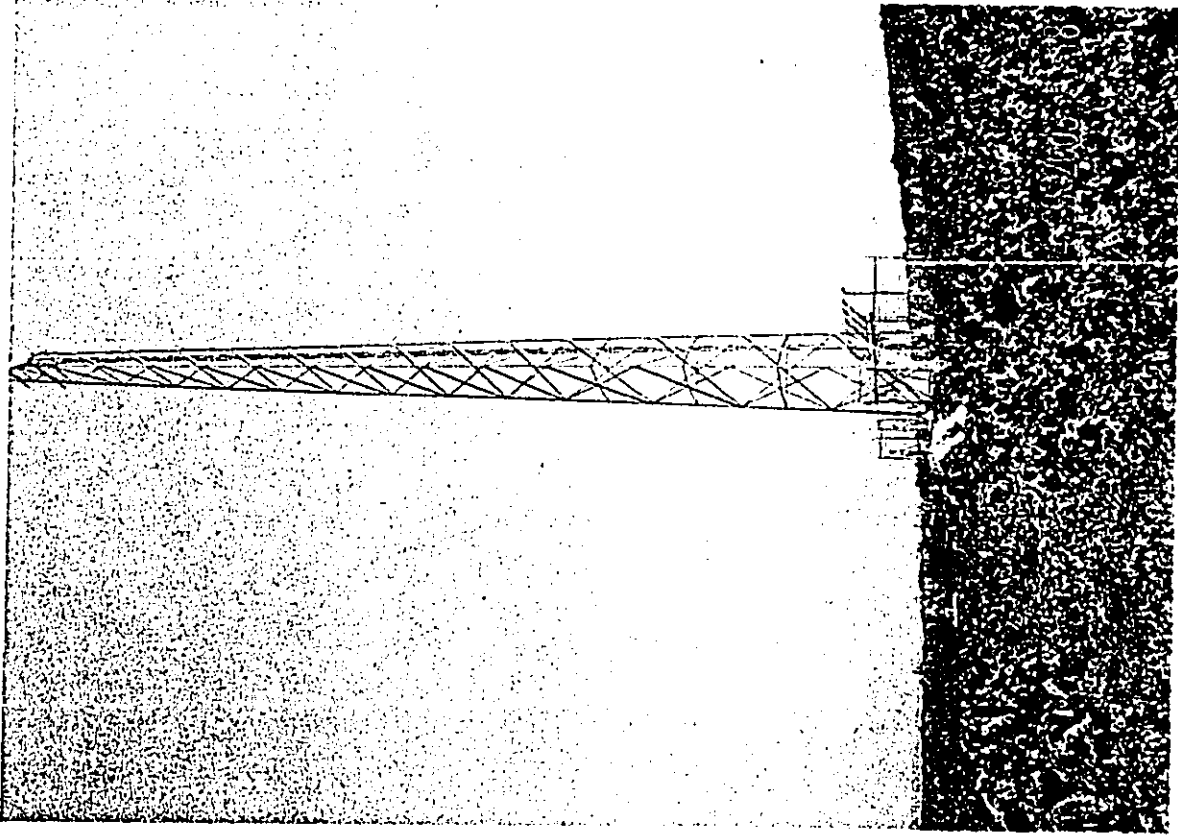
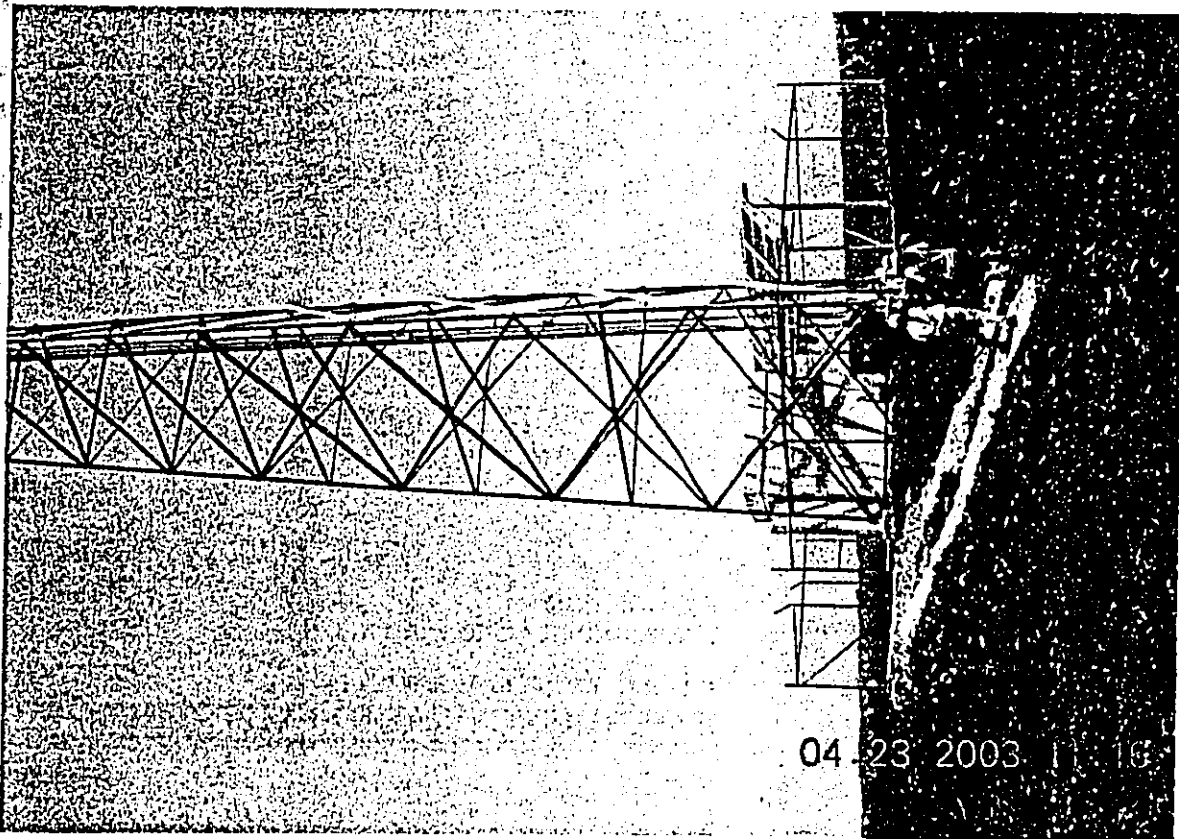


FIGURE 16C
Kauna Point / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



Existing Tower to be Refurbished

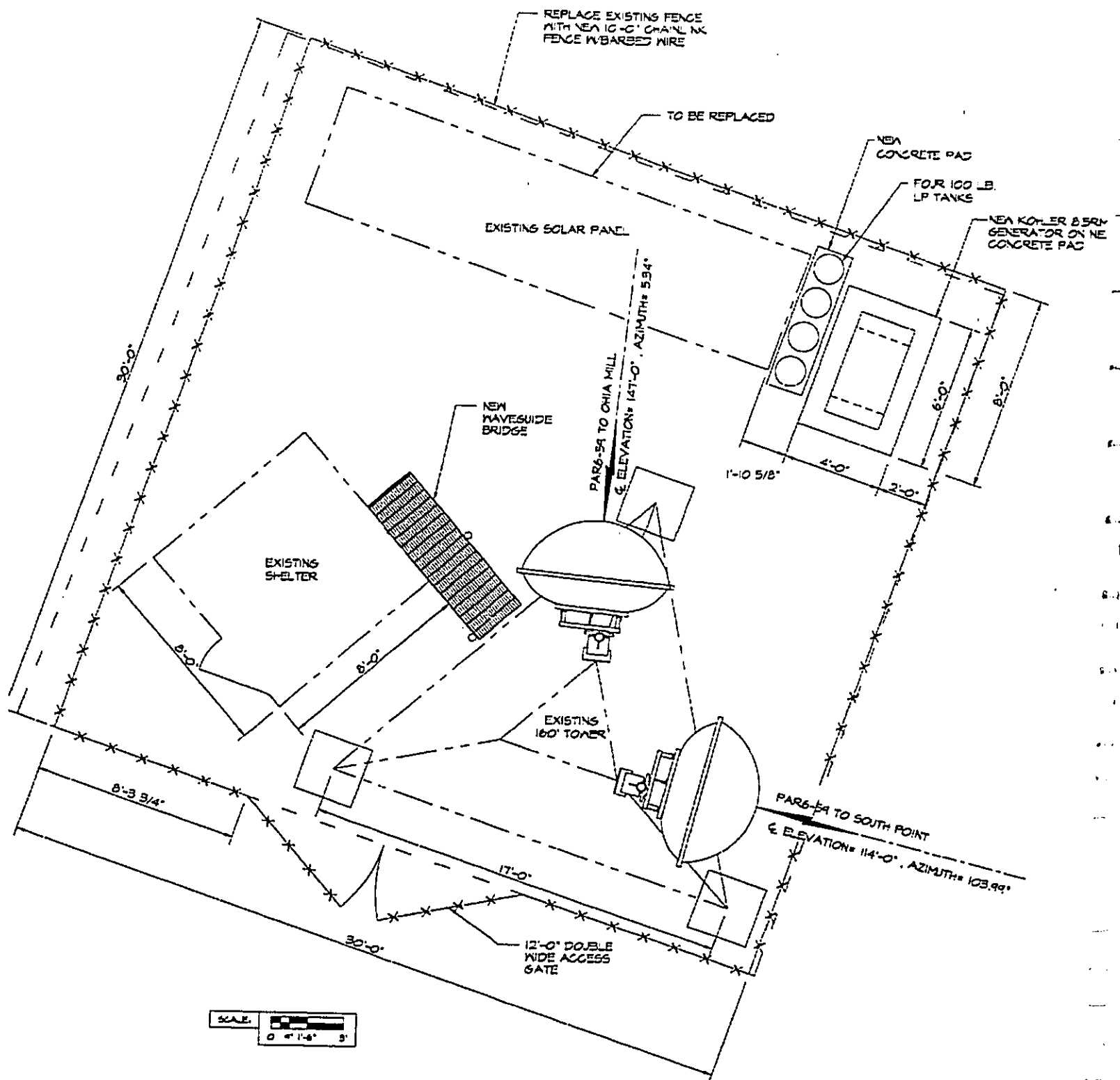


FIGURE 16D
Kauna Point / Site Plan

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



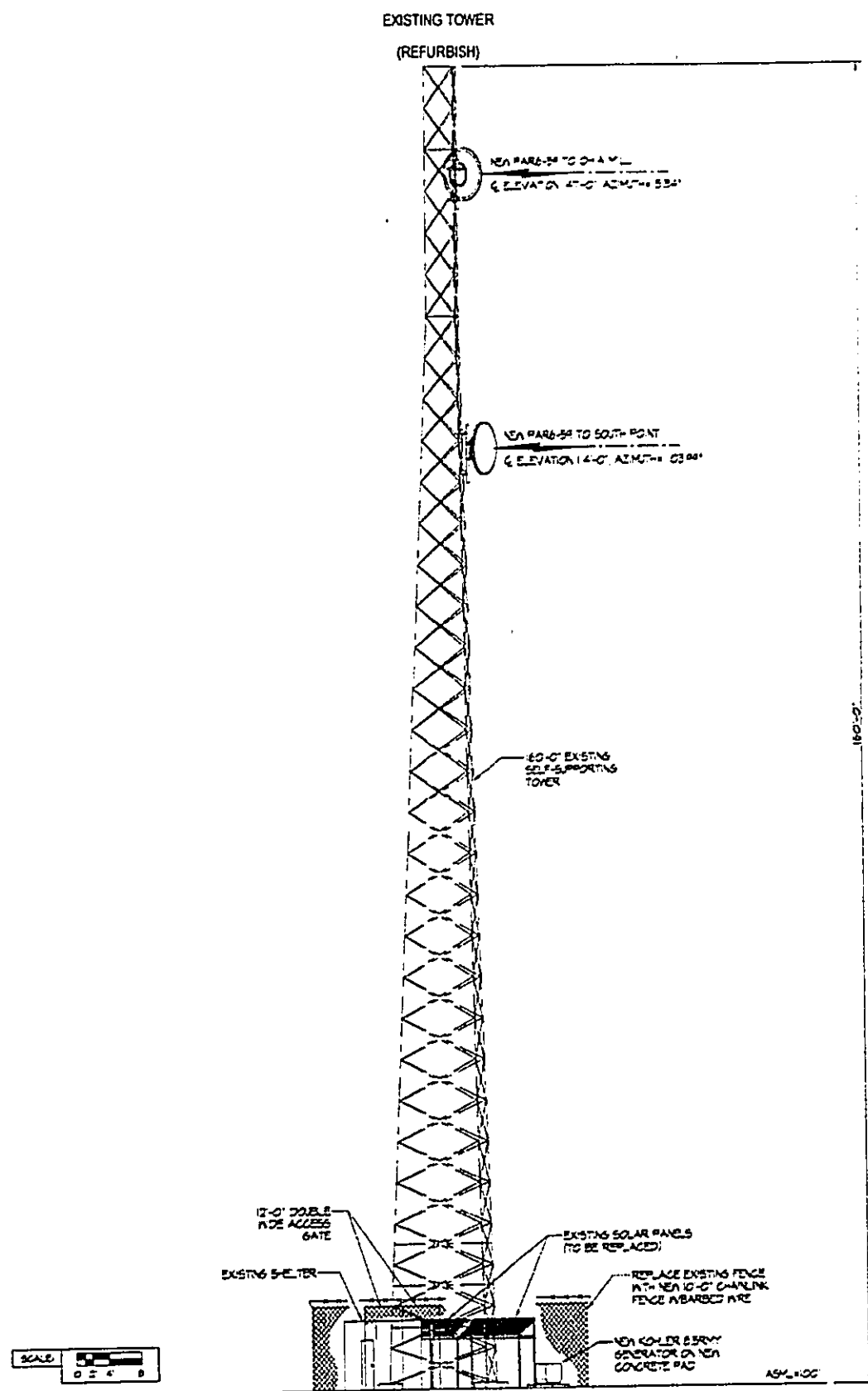


FIGURE 16E
 Kauna Point / Elevation Plan (looking north)
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



Source: Scientel America, Inc.

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.13 Kulani Cone

Location/Access. The Kulani Cone site is located adjacent to the south of the Kulani Correctional Facility and is at the boundary of three Hawaii County Districts - Puna, South Hilo, and Kau. Road access is from Mamalahoa Highway, Kulani Road, through the Kulani Correctional Facility, and onto the cinder cone. Access is controlled at the main gate and requires security clearance. Access to the summit of Kulani Cone, beyond the main campus of the correctional facility, is via a dirt and gravel roadway extending through heavily forested correctional facility land with several unmanned locked and unlocked gates. The property is identified as TMK9-9-001:024. Figure 17A shows the site location on the USGS quadrangle map. Figure 17B identifies the site on the TMK map. Site photographs are provided in Figure 17C.

Existing System. The County radio equipment is co-located on a facility owned by Oceanic Cablevision. The 180-ft guyed tower is equipped with a variety of antennas. The radio building is constructed from corrugated metal and is divided into three compartments used by the State of Hawaii, HELCO, and the County.

Other facilities at this location include commercial towers including a 175-ft self-supporting tower owned by Verizon.

Proposed Improvements. The site for the new facilities will be adjacent to the Verizon site and approximately 50 feet away from the existing Oceanic tower and will include the following improvements:

- New 250-ft self-supporting tower
- Five (5) new parabolic antennas
- New shelter to house digital radio equipment, batteries and charger
- New generator and propane bottles
- New chain link fence (approx. 35 ft x 60 ft)

Path. Kulani Cone provides repeater paths southwest to Naalehu Pasture via antennas at 245 feet and 215 feet above ground, a spur path north-northeast to the Puna Police Station via an antenna at 65 feet above ground, and a repeater path northeast to the Public Safety Building via antennas at 85 feet and 65 feet above ground.

Figures 17D and 17E show the site and elevation plans, respectively.

Co-Locaters. DOT, Emergency Medical System (EMS), FBI, PACMERS, HELCO

- 21-ft Fiberglass whip, yagi, and omni antennas

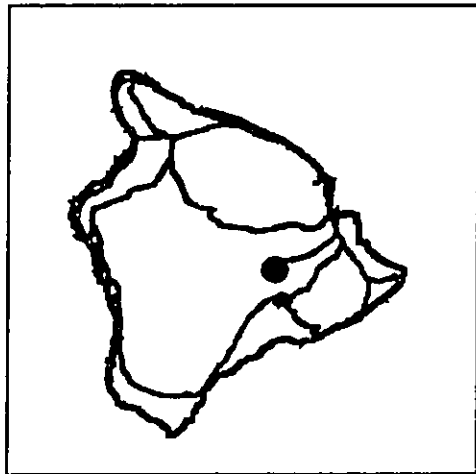
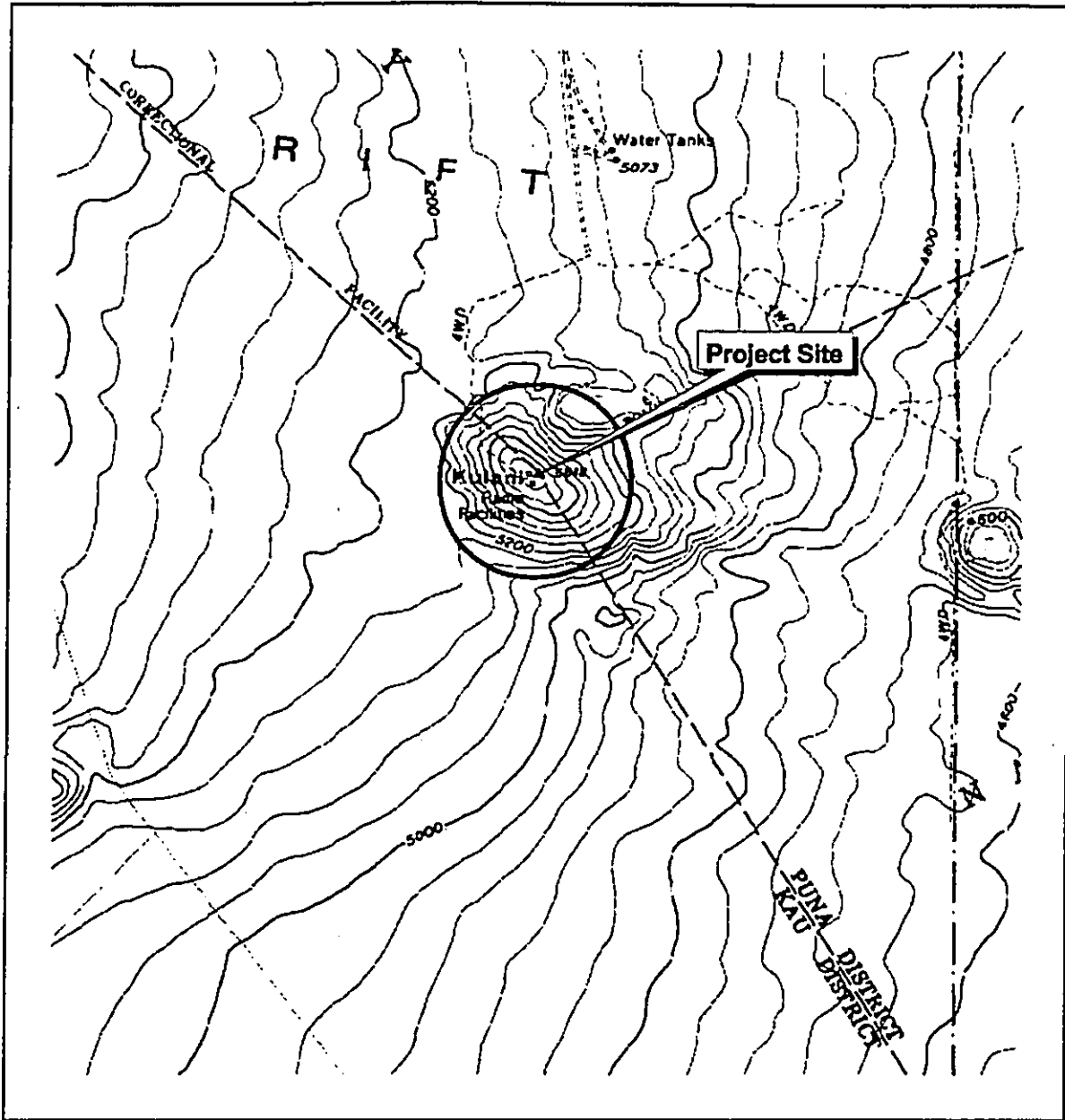


FIGURE 17A
 Kulani Cone / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES

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Source: USGS Kulani Quadrangle

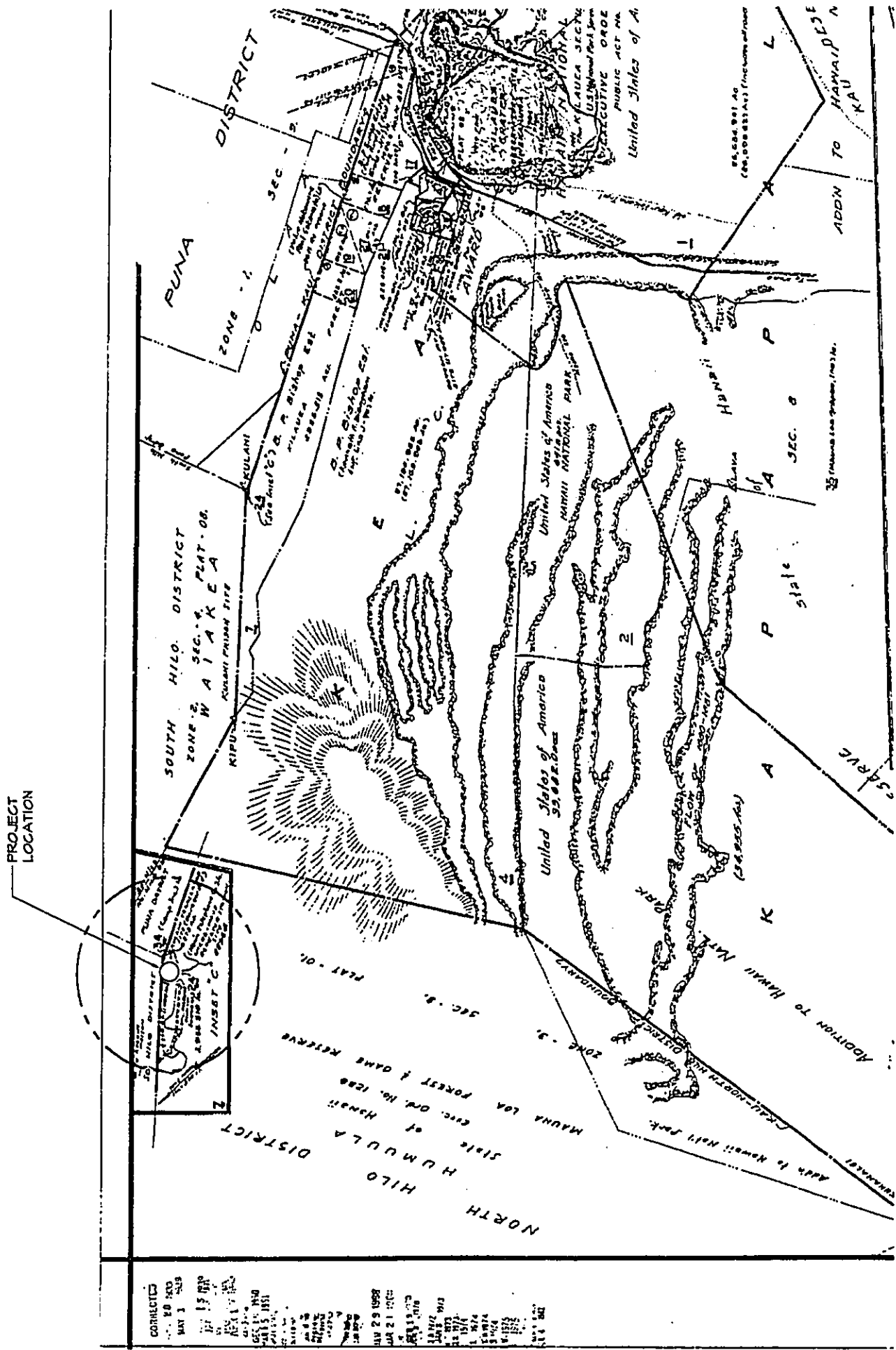




FIGURE 17B
Kulani Cone / TMK: 9-9-01:24

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

- LEGEND**
-  = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR
 -  = PROJECT LOCATION

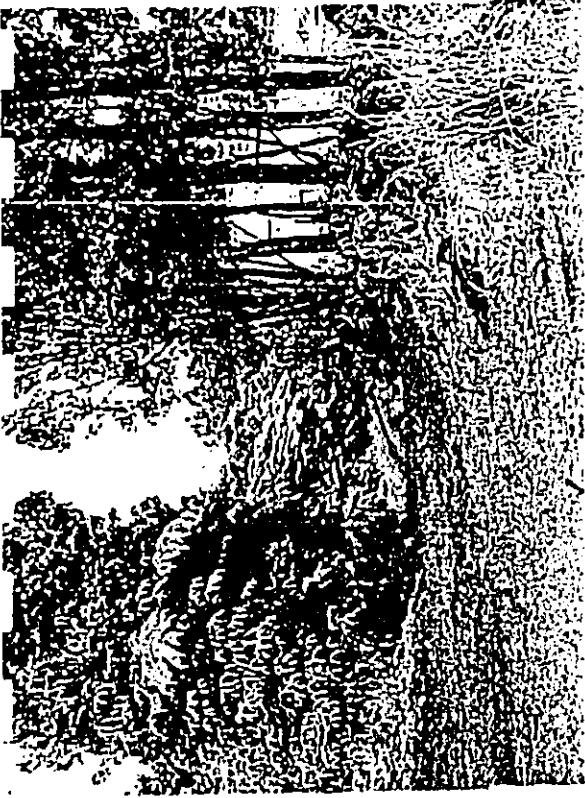
Source: County of Hawaii Tax Map Key



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Existing Tower



Access Road



New Tower Site to the Right of Verizon Tower



New Tower Site

FIGURE 17C
Kulani Cone / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

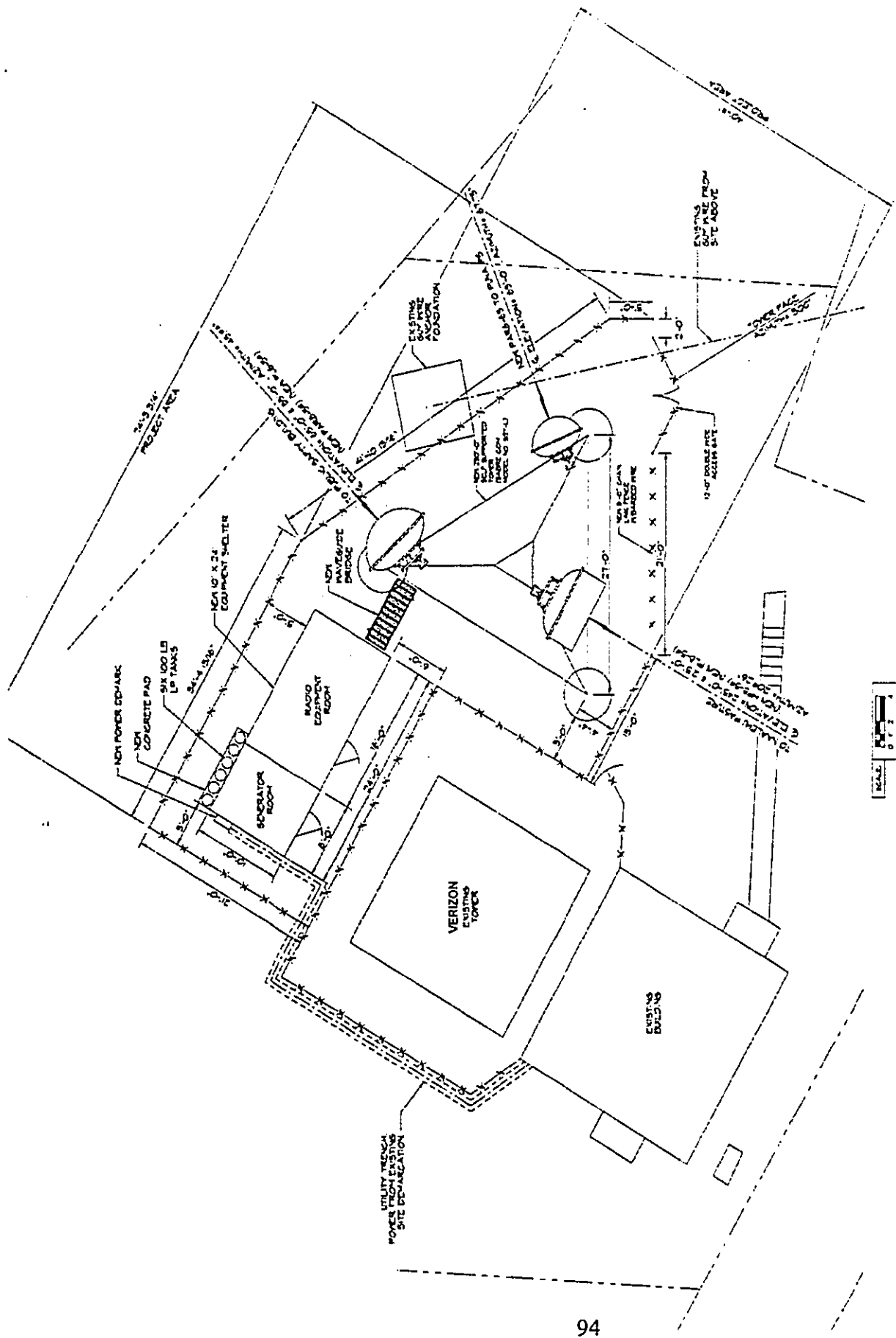


FIGURE 17D
 Kulani Cone / Site Plan
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



Source: Scientific America, Inc.



June 2003

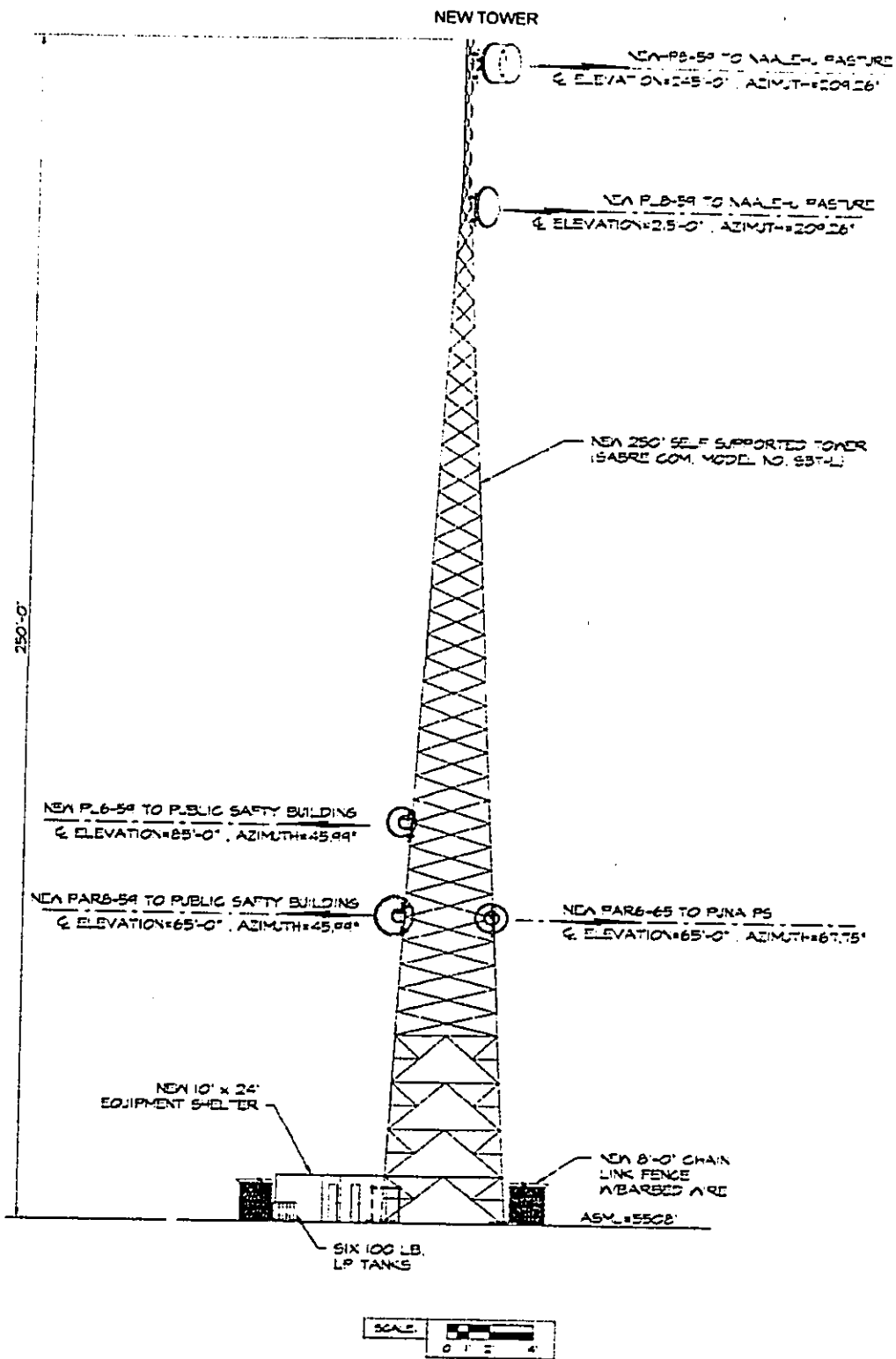


FIGURE 17E
Kulani Cone / Elevation Plan (looking east)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.14 Moanuaiea

Location/Access. The Moanuaiea site is above the Makalei Hawaii Country Club (72-3890 Hawaii Belt Road, Kalaoa 96740) in the North Kona district. Access is from Hawaii Belt Road (Hwy 190), through the golf course property, and through a 1.5-mi ranch road to the radio facility. The property is identified as TMK 7-2-007:001. Figure 18A shows the site location on the USGS quadrangle map. Figure 18B identifies the site on the TMK map. Site photographs are provided in Figure 18C.

Existing System. This site is located northeast of Kailua and is a relatively new County site that was activated during the completion of the microwave loop system. The radio shelter is an 8-ft x 10-ft prefabricated fiberglass unit. The 60-ft tower is self-supporting and has the microwave and police radio antennas installed.

Proposed Improvements. The new facility will be approximately 40 feet east of the existing facility and will include the following improvements:

- New 80-ft self supporting tower
- Three (3) new parabolic antennas
- New shelter to house radio equipment, batteries and charger
- Refurbish existing generator building and fuel system
- New 8-ft high chain link fence (approx. 30 ft x 30 ft)

Path. Moanuaiea provides repeater paths southeast to Kailua Police Station via an antenna at 45 feet above ground and north to Kahua Ranch via antennas at 75 feet and 45 feet above ground.

Figures 18D and 18E show the site and elevation plans, respectively.

Co-Locater. FBI

- 21-ft Fiberglass whip antenna

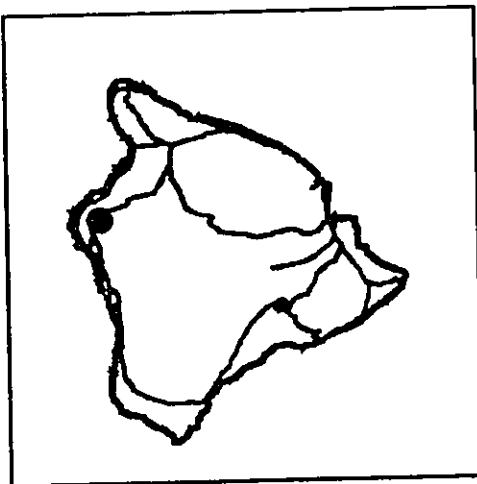
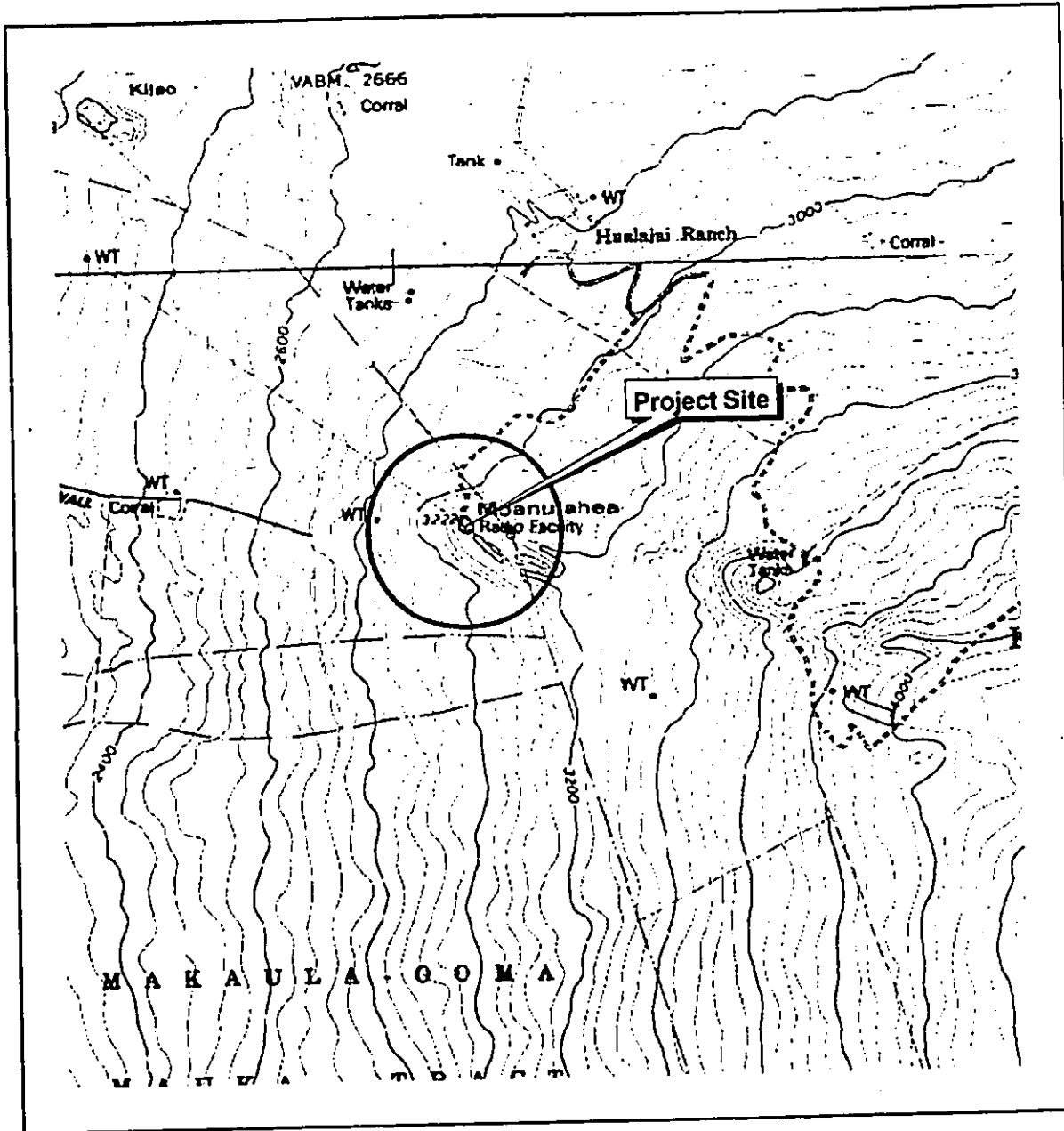
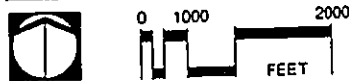


FIGURE 18A
 Moanuahea / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



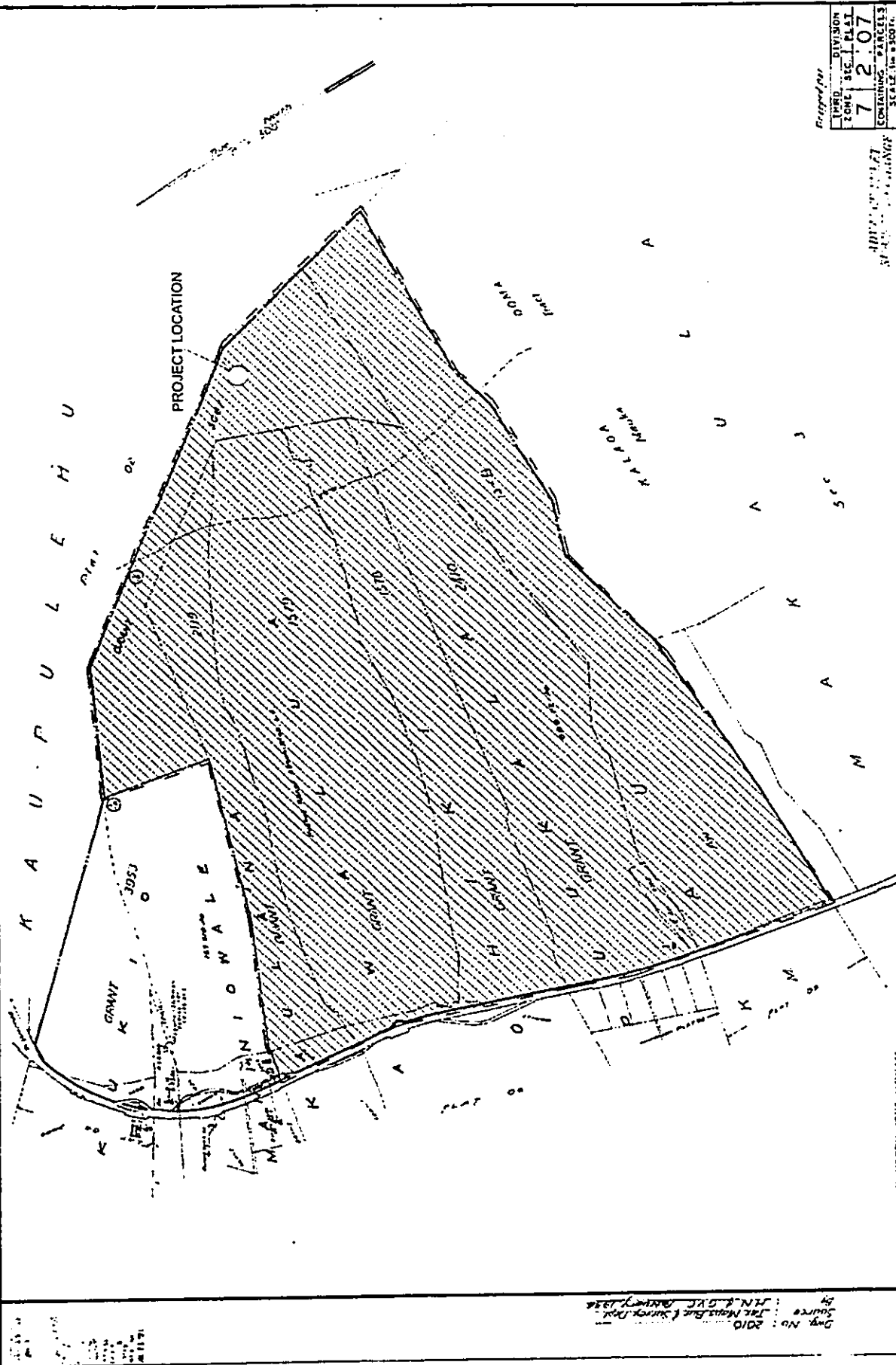


FIGURE 18B
 Moanulahea / TMK: 7-2-07:01
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

LEGEND

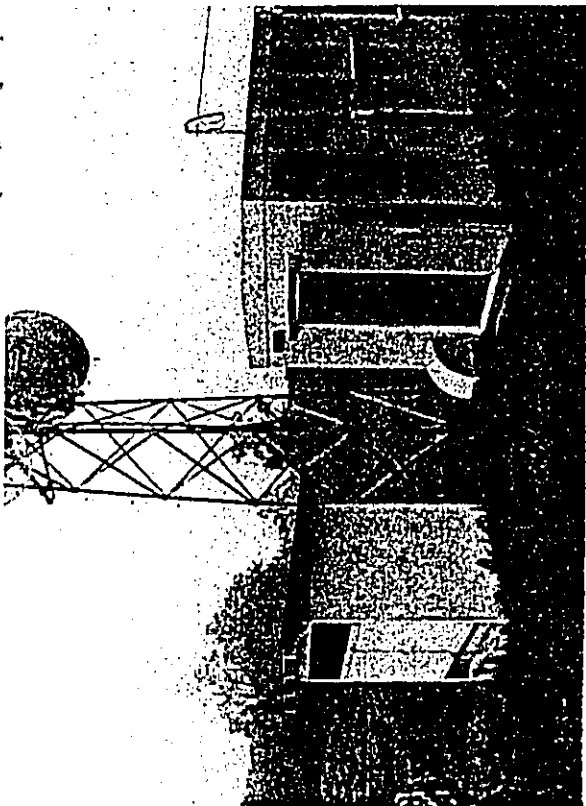
[Hatched Box] = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR

[Circle] = PROJECT LOCATION

Source: County of Hawaii Tax Map Key



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Existing Tower



Replacement Tower Site

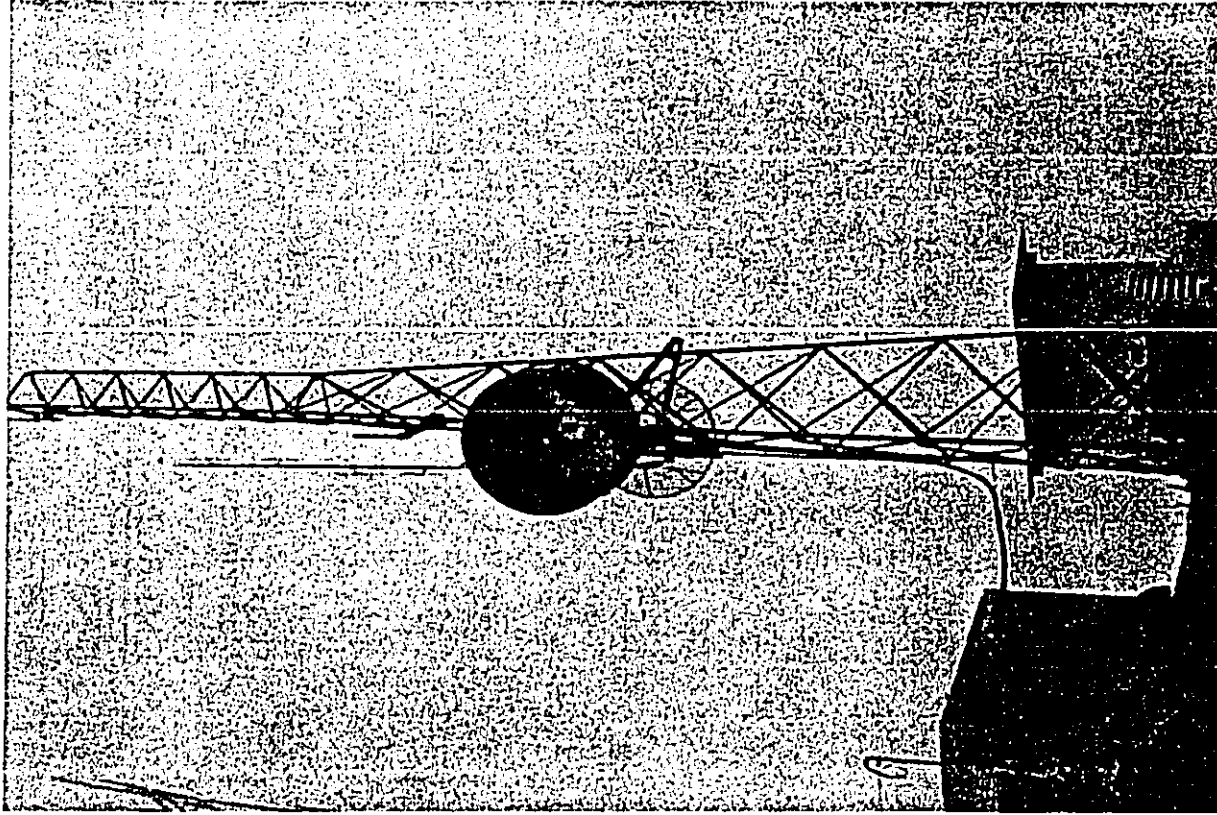


FIGURE 18C
Moanuaieha / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

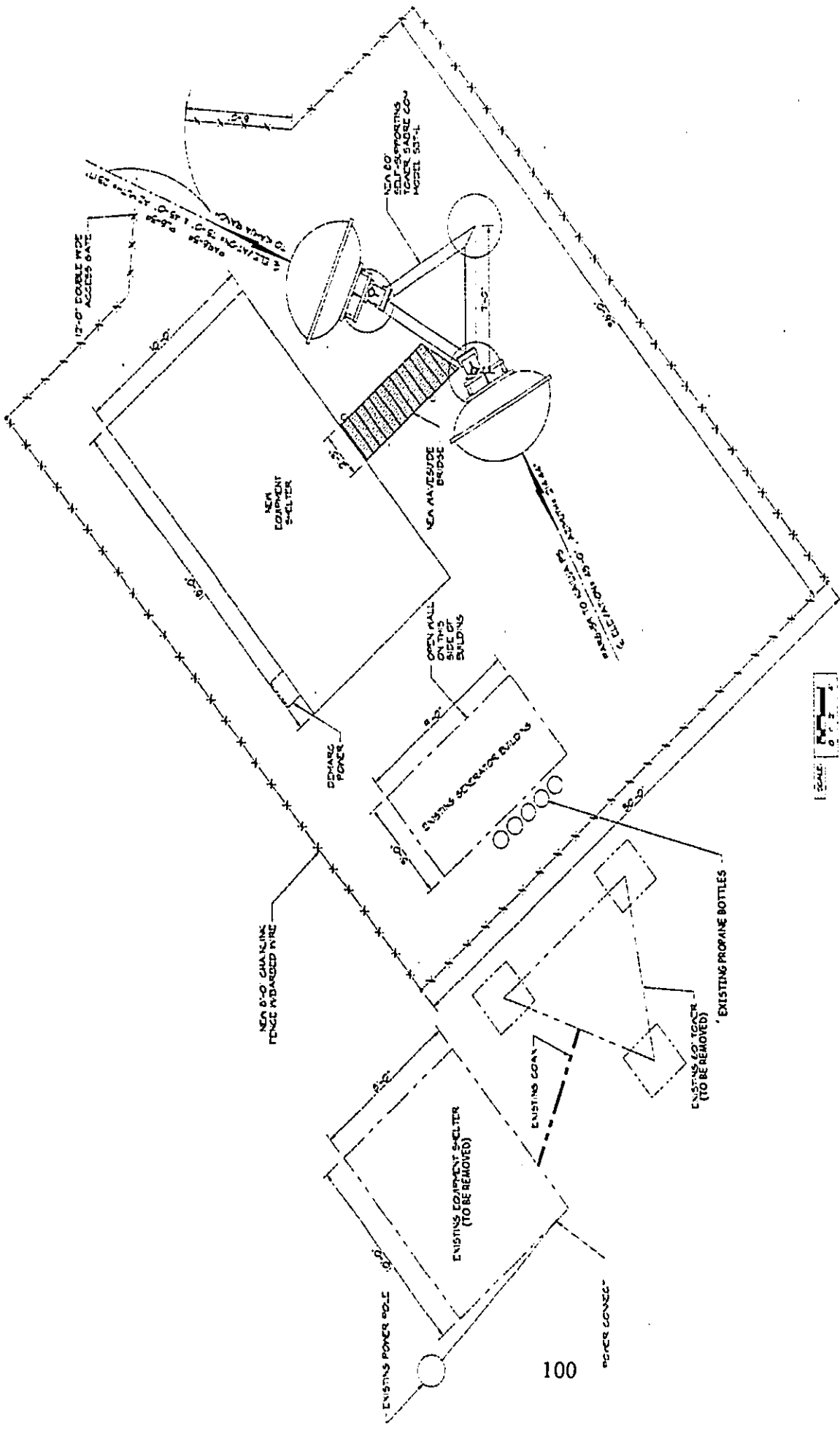


FIGURE 18D
Moanuahea / Site Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003



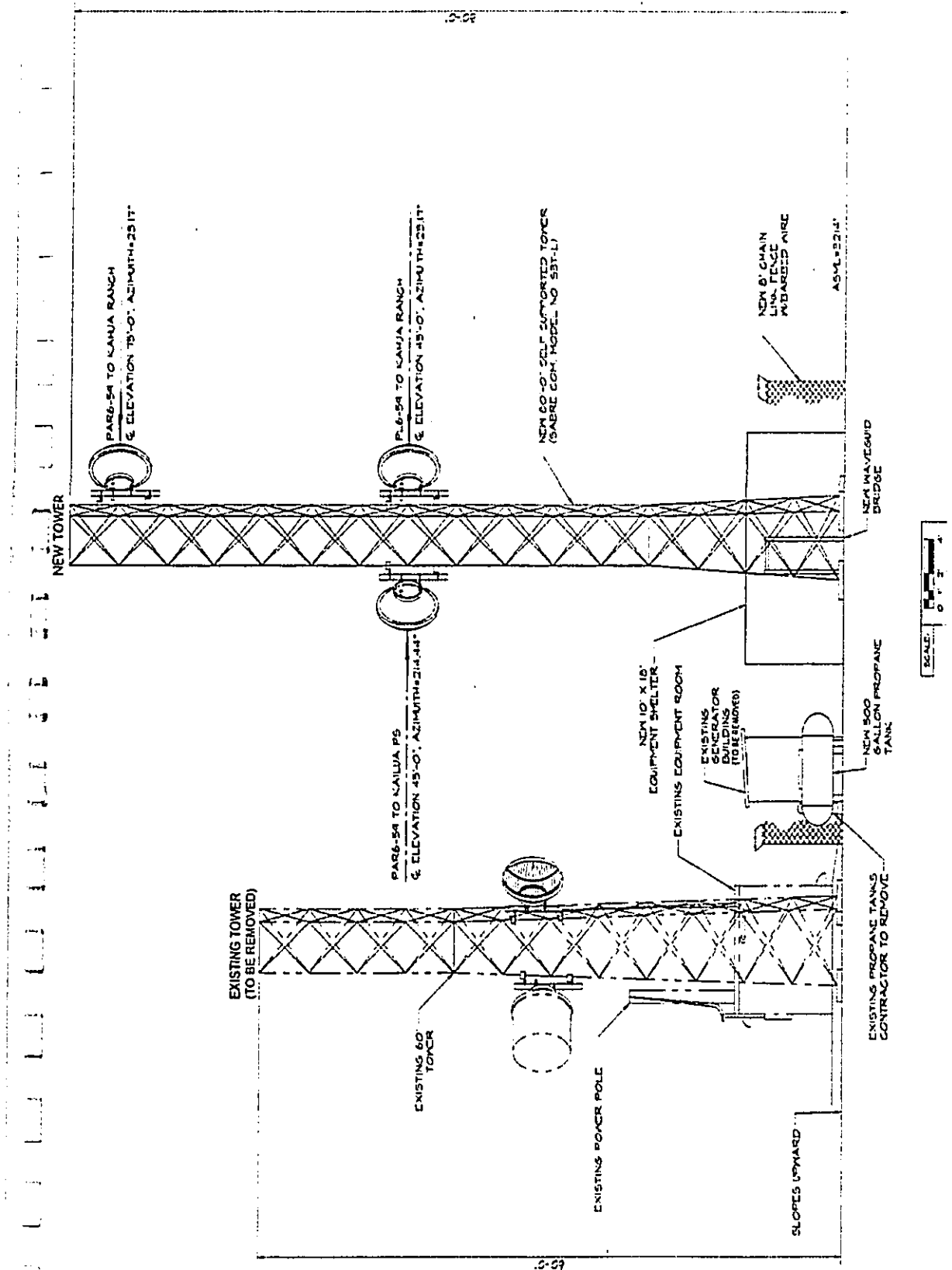


FIGURE 18E
Moanuaieha / Elevation Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.15 Naalehu Pasture

Location/Access. The Naalehu Pasture site is located directly south of the town of Naalehu, in the ahupuaa of Kahilipali Nui, in Kau district. Access to the site is via Mamalahoa Highway and unpaved ranch roads. The property is identified as TMK 9-5-007:030. Figure 19A shows the site location on the USGS quadrangle map. Figure 19B identifies the site on the TMK map. Site photographs are provided in Figure 19C.

Existing System The radio site is located south of the community of Naalehu in an area known as Naalehu Pasture. The radio building is a 12-x26-ft cement block building that was constructed during the Fire Department radio system upgrade in the early 1980's. It is divided into a radio equipment room and an emergency generator room. A rusted and corroded tower was recently replaced with a new 50-ft tower one. The radio room is somewhat crowded but space is still available for two more small radio cabinets.

Proposed Improvements. The following improvements will be made to this site:

- New 100-ft self supporting tower
- Four (4) new parabolic antennas
- Refurbish existing shelter for new digital radio equipment, batteries and chargers
- New generator and existing propane bottles
- New 8 ft-high chain link fence (approx. 30 ft x 40 ft)

Path. Naalehu Pasture provides a spur path north to Kau Police Station via an antenna at 85 feet above ground, a repeater path north to Kulani Cone via antennas at 95 feet and 65 feet above ground, and a repeater path southwest to South Point via an antenna at 35 feet above ground.

Figures 19D and 19E show the site and elevation plans, respectively.

Co-Locaters. DLNR, DOT, EMS, HELCO

- 21-ft Fiberglass whip, yagi and omni antennas

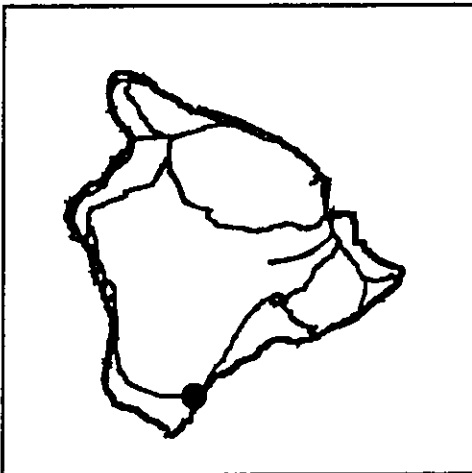
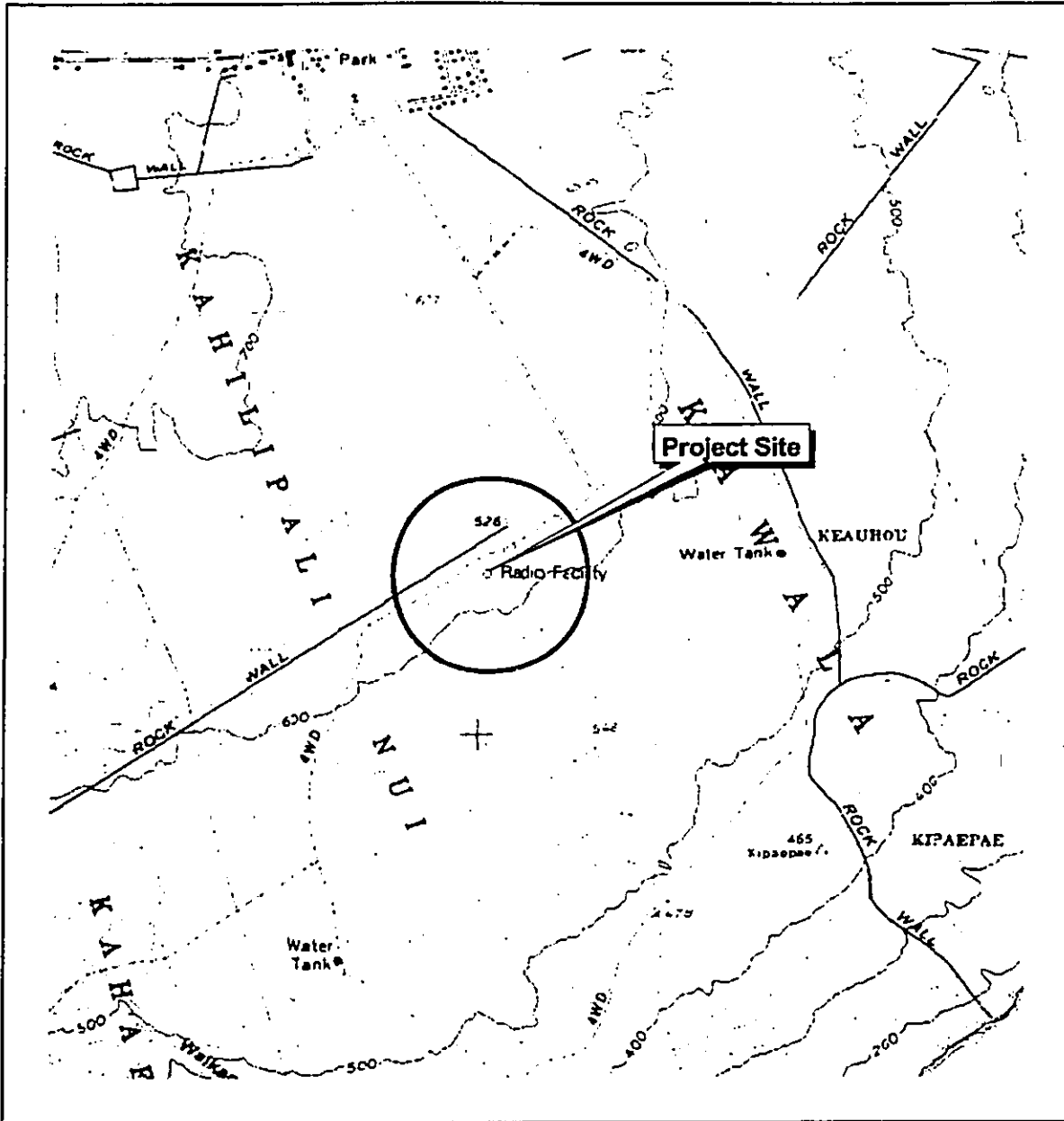


FIGURE 19A
Naalehu Pasture / Location Map
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

Source: USGS Naalehu Quadrangle



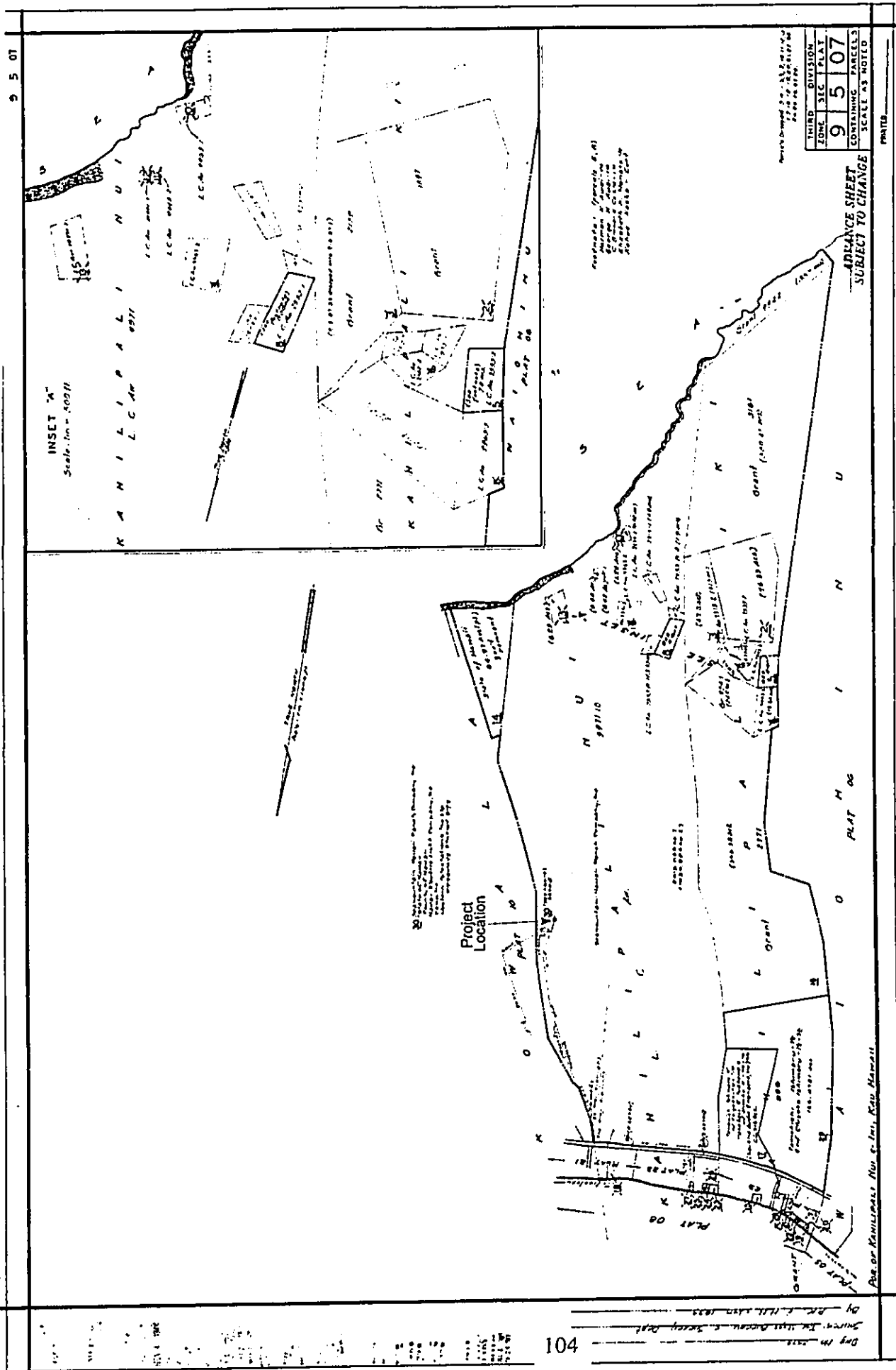


FIGURE 19B
Naalehu Pasture / TMK: 9-5-07:30
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

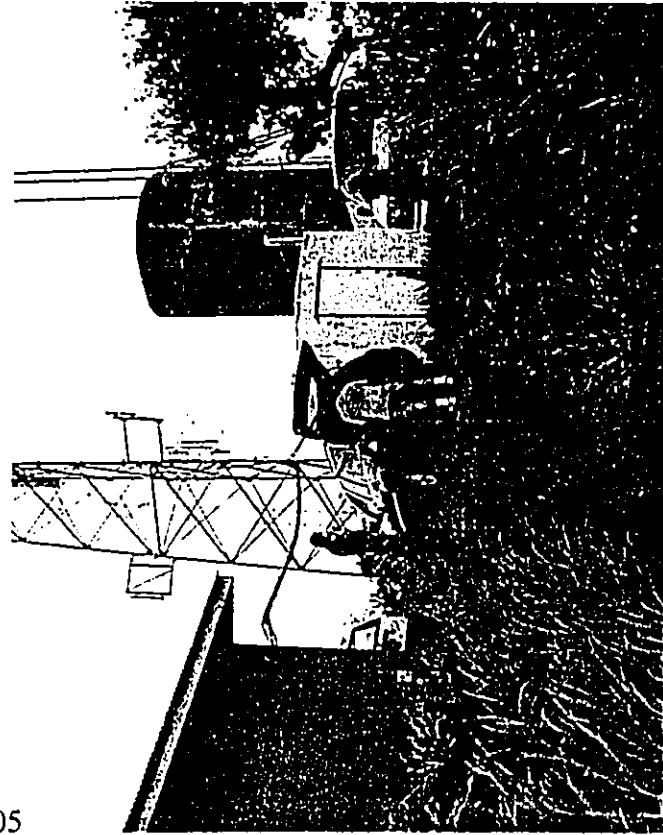
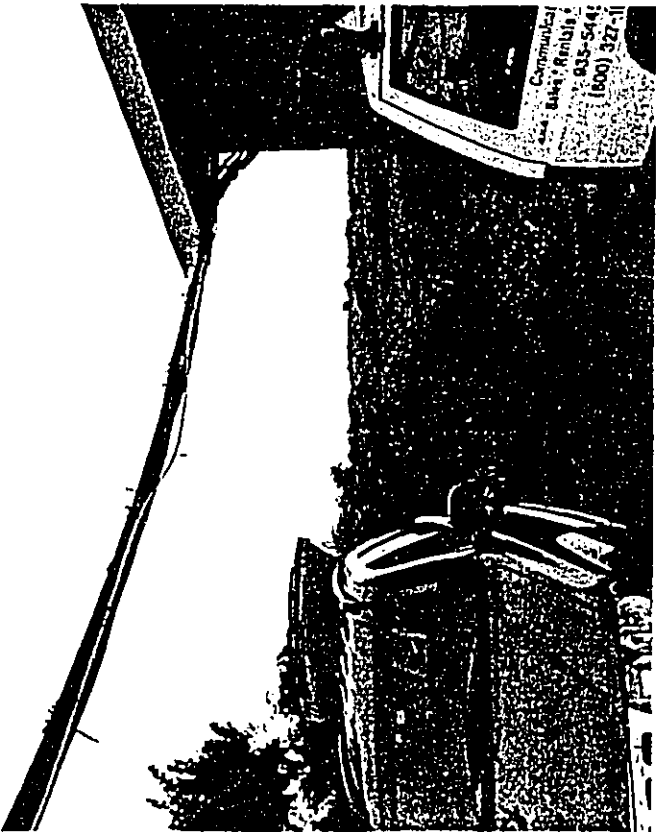
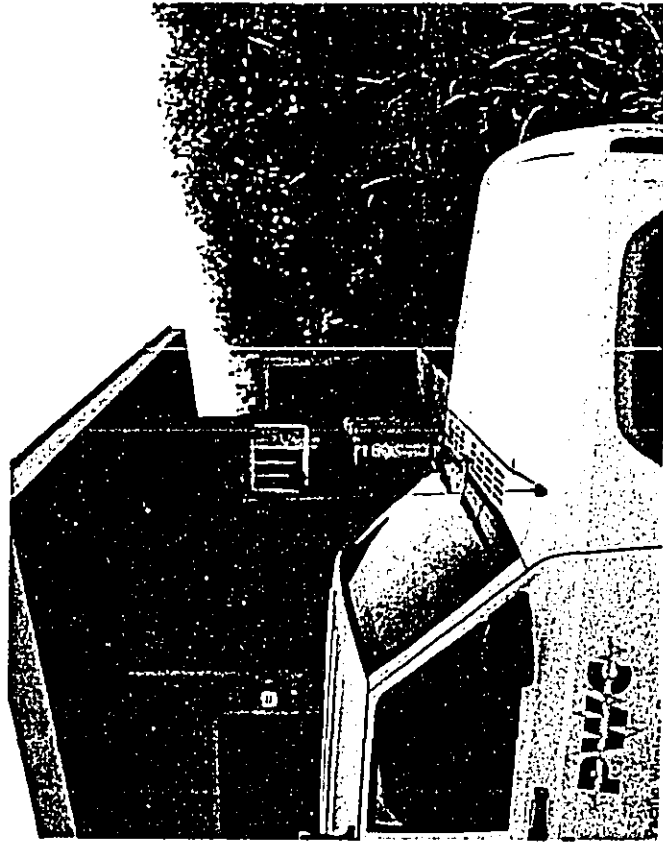


NOT TO SCALE



June 2003

Source: County of Hawaii Tax Map Key



Replacement Tower will be to the Right of the Shelter
in Front of the Existing Tower

FIGURE 19C
Naalehu Pasture / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

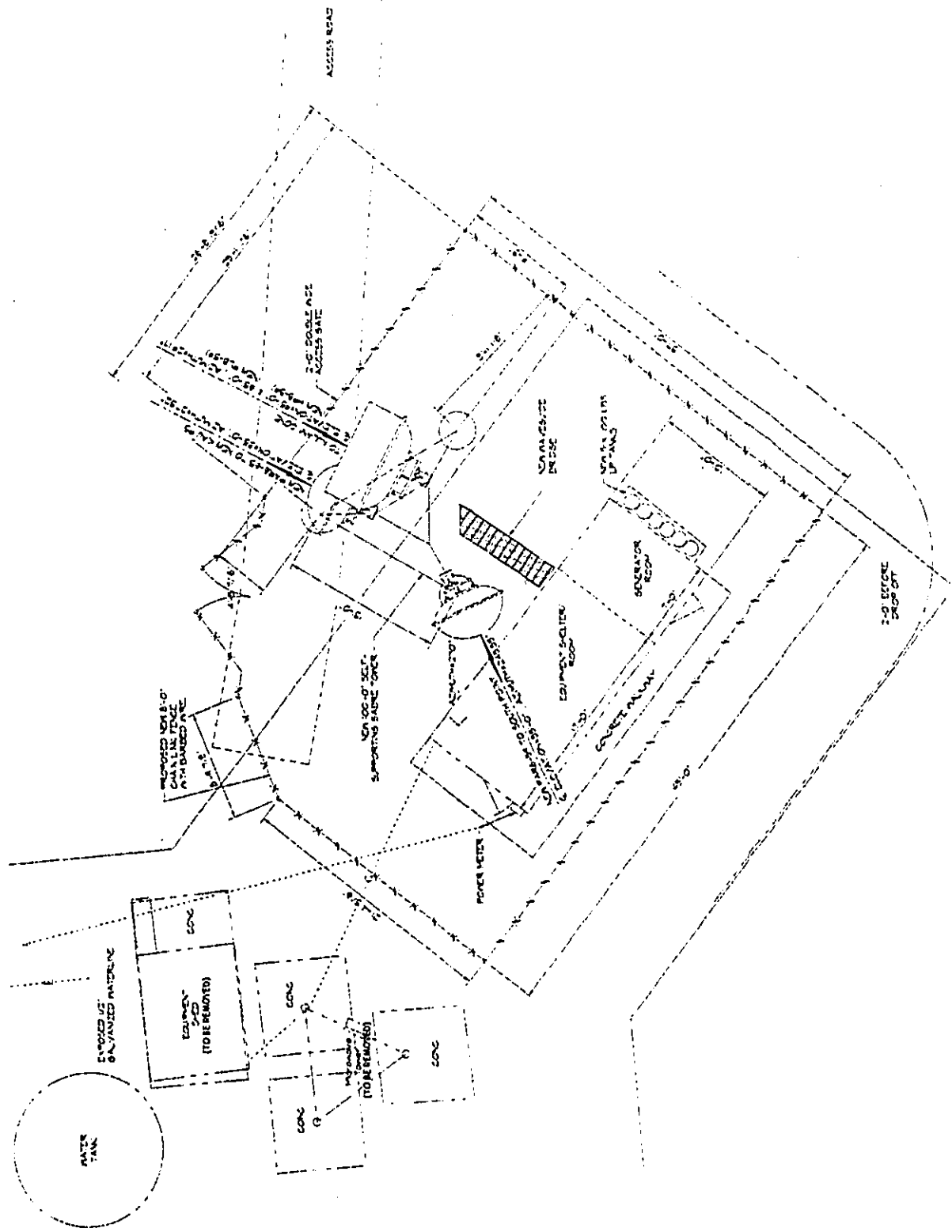


FIGURE 19D
Naalehu Pasture / Site Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.16 Ohia Mill

Location/Access. The Ohia Mill site is located on the Yee Hop Ranch, in the ahupuaa of Alika, in the South Kona district. Access to the site is via Mamalahoa Highway and unpaved ranch roads. The property is identified as TMK 8-8-001:003. Figure 20A shows the site location on the USGS quadrangle map. Figure 20B identifies the site on the TMK map. Site photographs are provided in Figure 20C.

Existing System. The Ohia Mill facilities include a 10 ft x 24 ft prefabricated fiberglass radio shelter with commercial power and an emergency backup generator that was installed during the loop system upgrade. The 100-ft tower is a self-supporting unit.

Proposed Improvements. The new facility will be approximately 30 feet northeast of the existing facility. The following improvements will be installed at this site:

- New 150-ft self-supporting tower
- Four (4) new parabolic antennas
- New shelter to house digital radio equipment; batteries and charger
- New generator and propane bottles
- New 8-ft high chain link fence (approx. 35 ft x 40 ft)

Path. Ohio Mill will provide a repeater path south to Kauna Point via an antenna at 145 feet above ground, a spur path north to Captain Cook Police Station via an antenna at 115 feet above ground and a repeater path north-northwest to Kailua Police Station via antennas at 107 feet and 85 feet above ground.

Figures 20D and 20E show the site and elevation plans, respectively.

Co-Locaters. DLNR, DOT, EMS, FBI, HELCO

- 21-ft Fiberglass whips, yagis and omni antennas

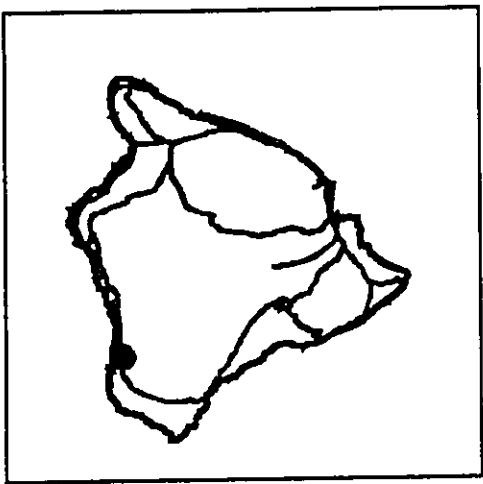
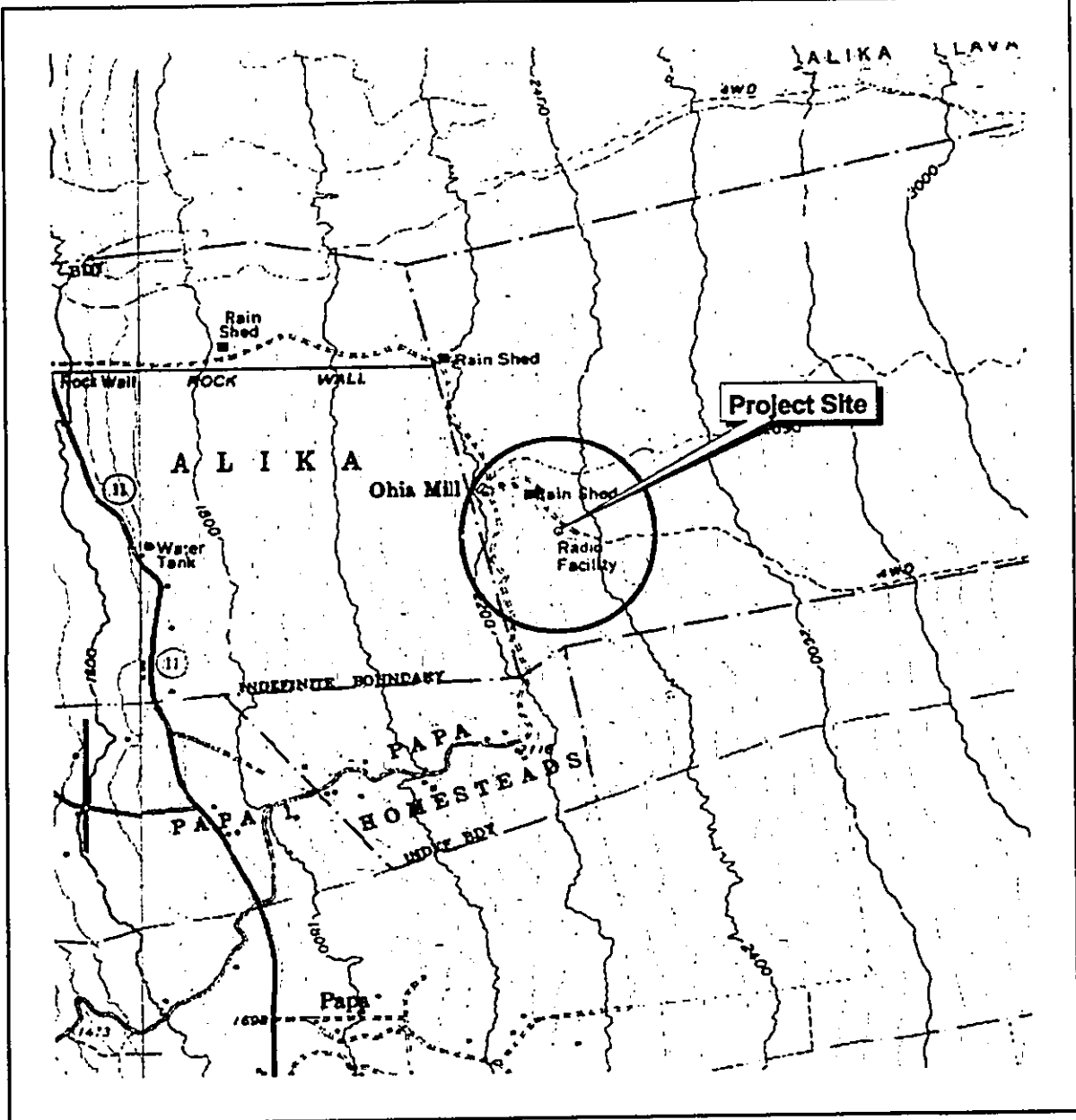
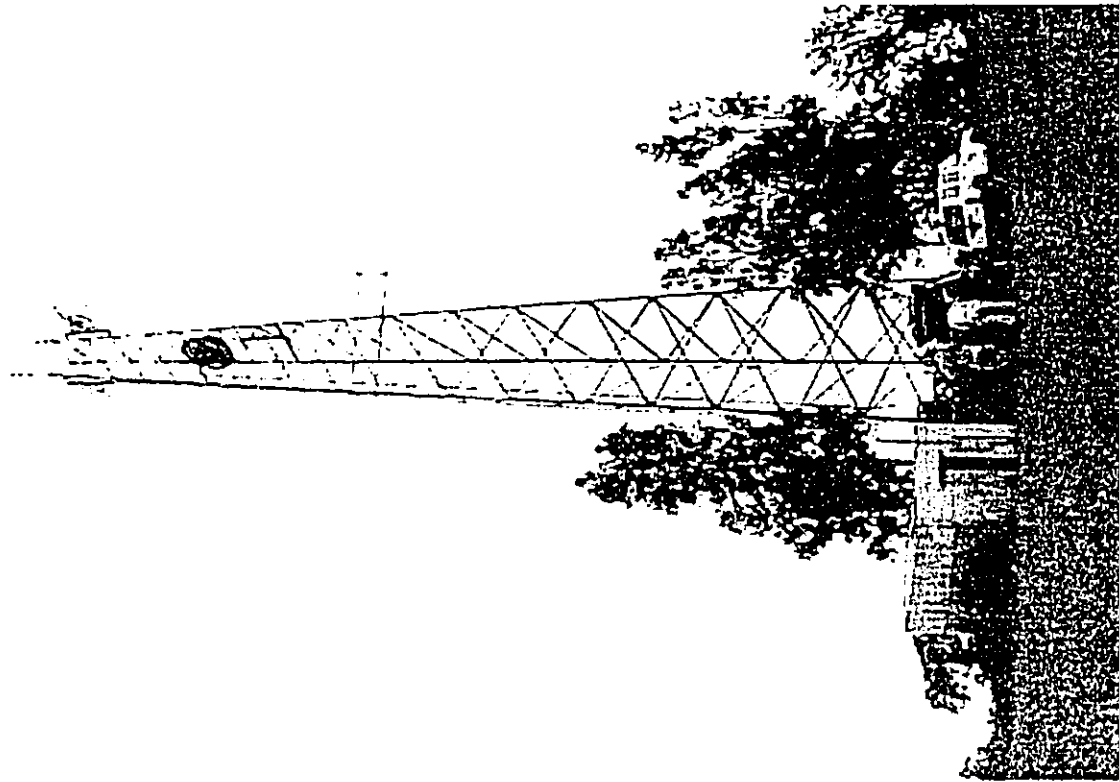
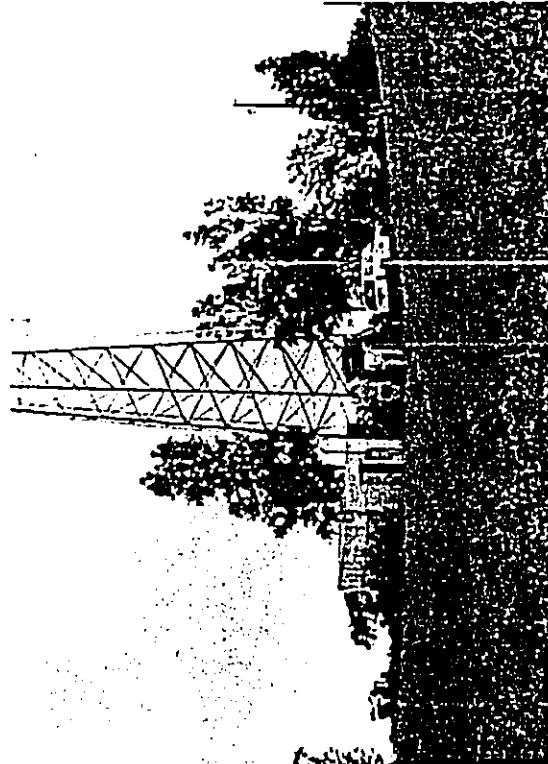


FIGURE 20A
 Ohia Mill / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



Source: USGS Papa Quadrangle



Replacement Tower Site to the Right of the Existing Tower

FIGURE 20C
Ohia Mill / Site Photos

**COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES**



June 2003

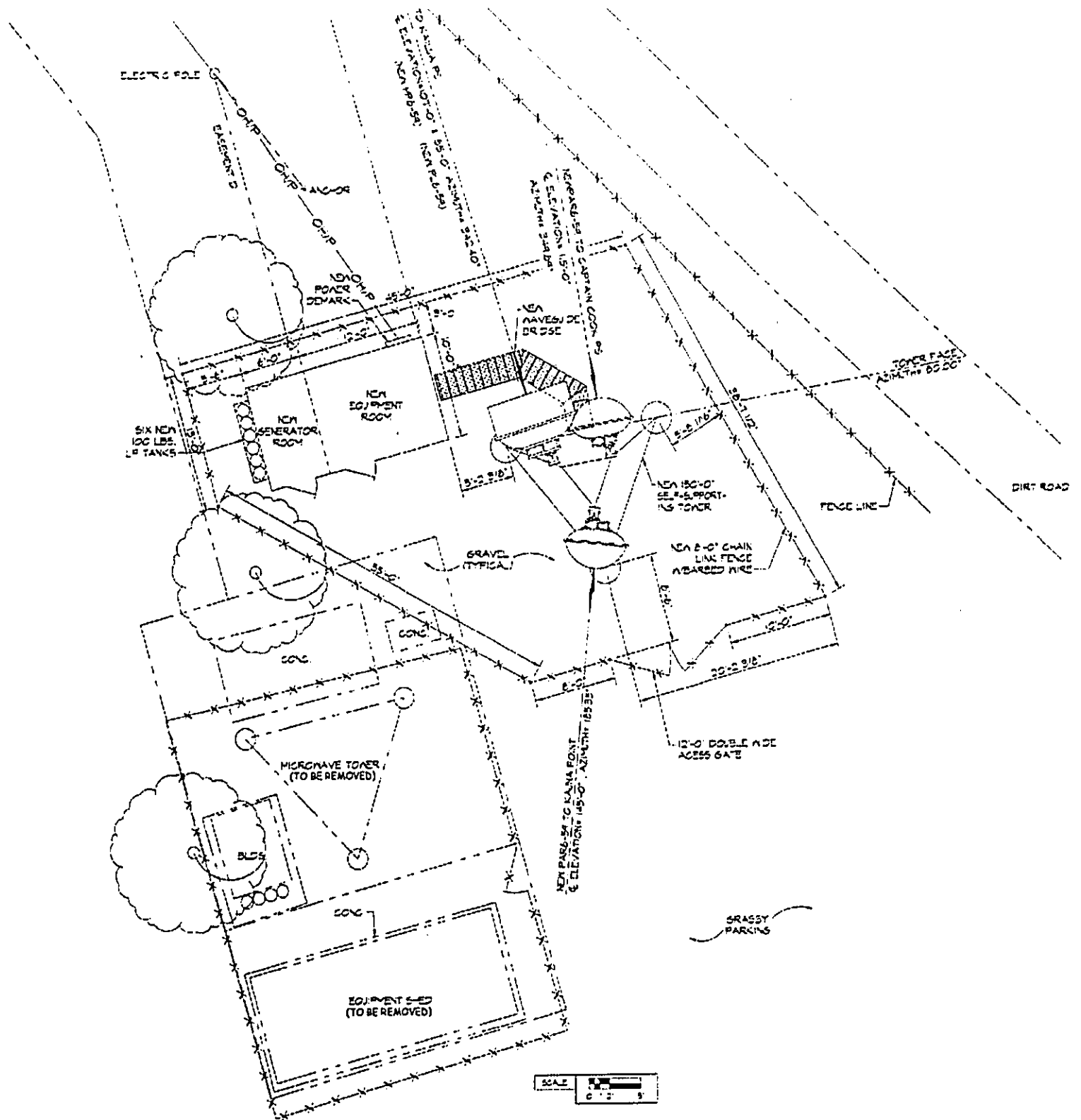


FIGURE 20D
 Ohia Mill / Site Plan
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



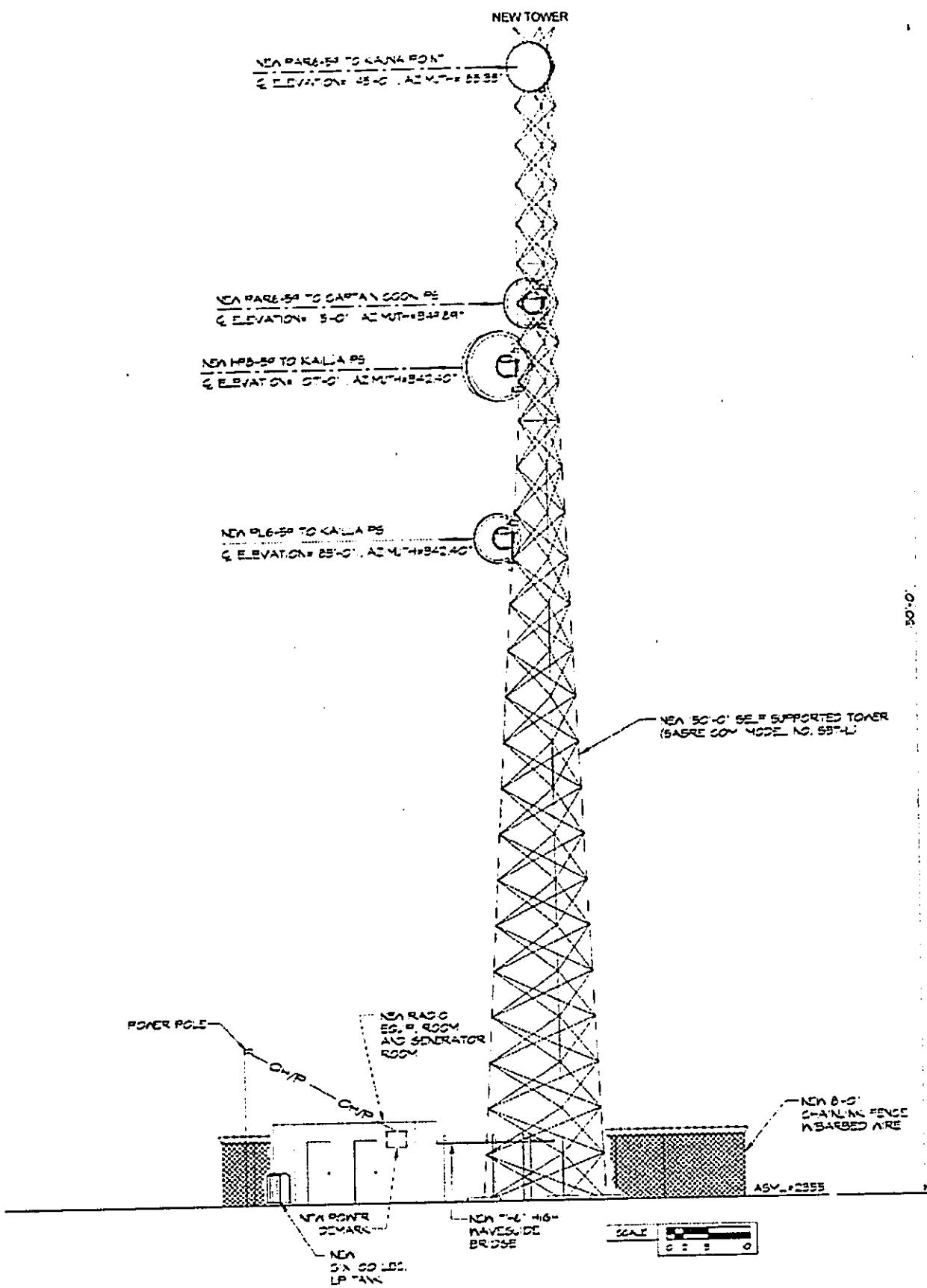


FIGURE 20E
Ohia Mill / Elevation Plan (looking north)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

Source: Scientel America, Inc.

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.17 Public Safety Building

Location/Access. The Public Safety Building is located at 349 Kapiolani Street in Hilo, South Hilo district and serves as the main headquarter of the Hawaii Police Department. The property is identified as TMK 2-4-025:028. Figure 21A shows the site location on the USGS quadrangle map. Figure 21B identifies the site on the TMK map and Figure 21B-1 depicts a boundary plan. Site photographs are provided in Figure 21C.

Existing System. This site consists of a 100-ft self-supporting tower and radio equipment within the police station next to the Dispatch Center. The existing tower was constructed in 1998 – 1999.

Proposed Improvements. The following improvements will be made to this site:

- Use 100-ft self-supporting tower
- Three (3) new parabolic antennas
- Refurbish existing room; new digital radio equipment, batteries and chargers
- Use existing generator and fuel tank

Path. The Public Safety Building facility provides a backbone path southeast to the County Baseyard via an antenna 95 feet above ground, a spur path north to Fire Central via an antenna 88 feet above ground, and a backbone path southwest to Kulani Cone via antennas at 97 feet and 77 feet above ground.

Figures 21D and 21E show the site and elevation plans, respectively.

Co-Locater. None

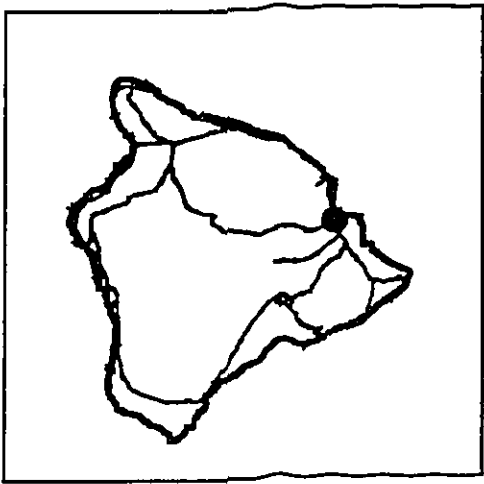
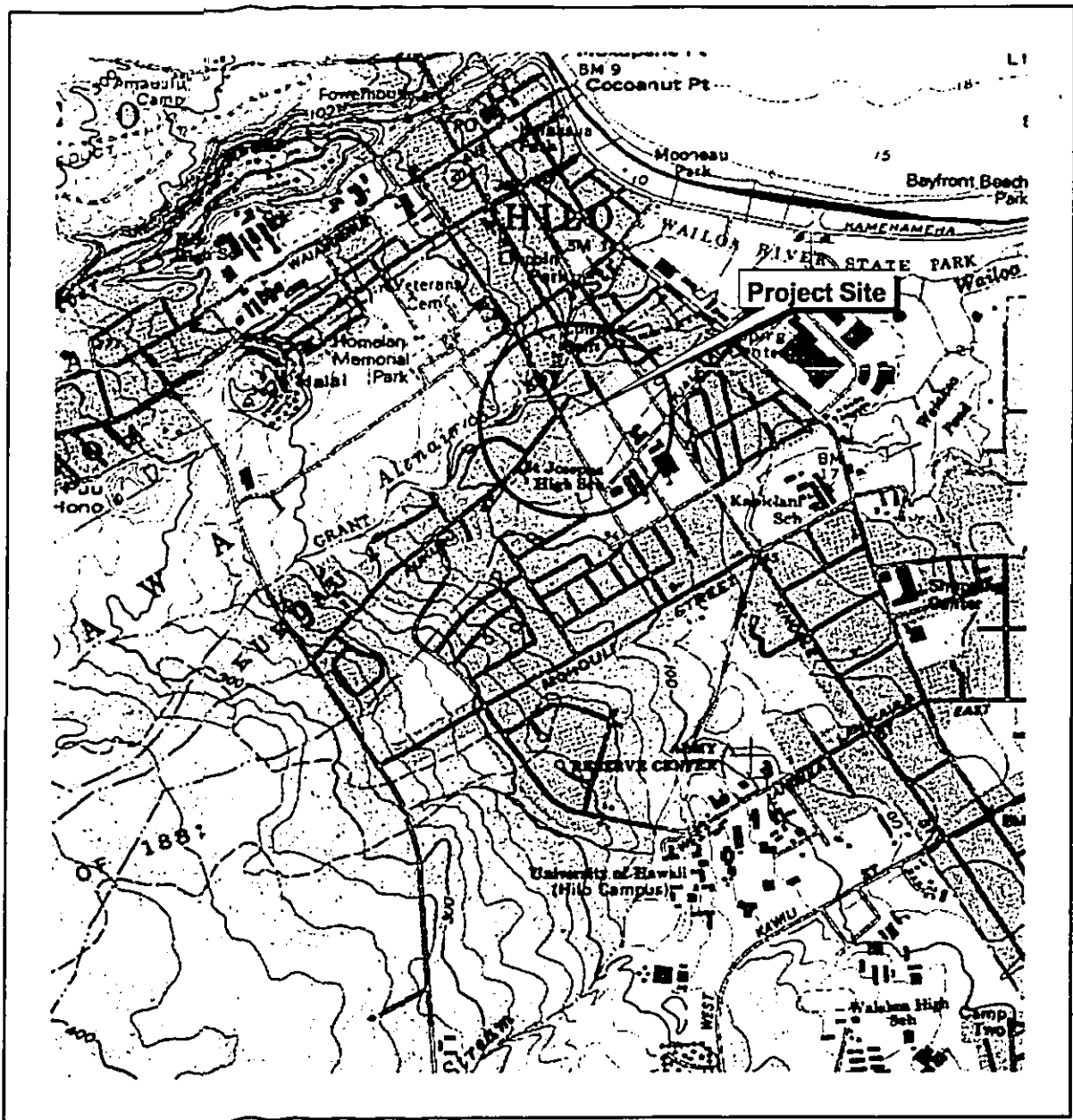
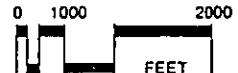
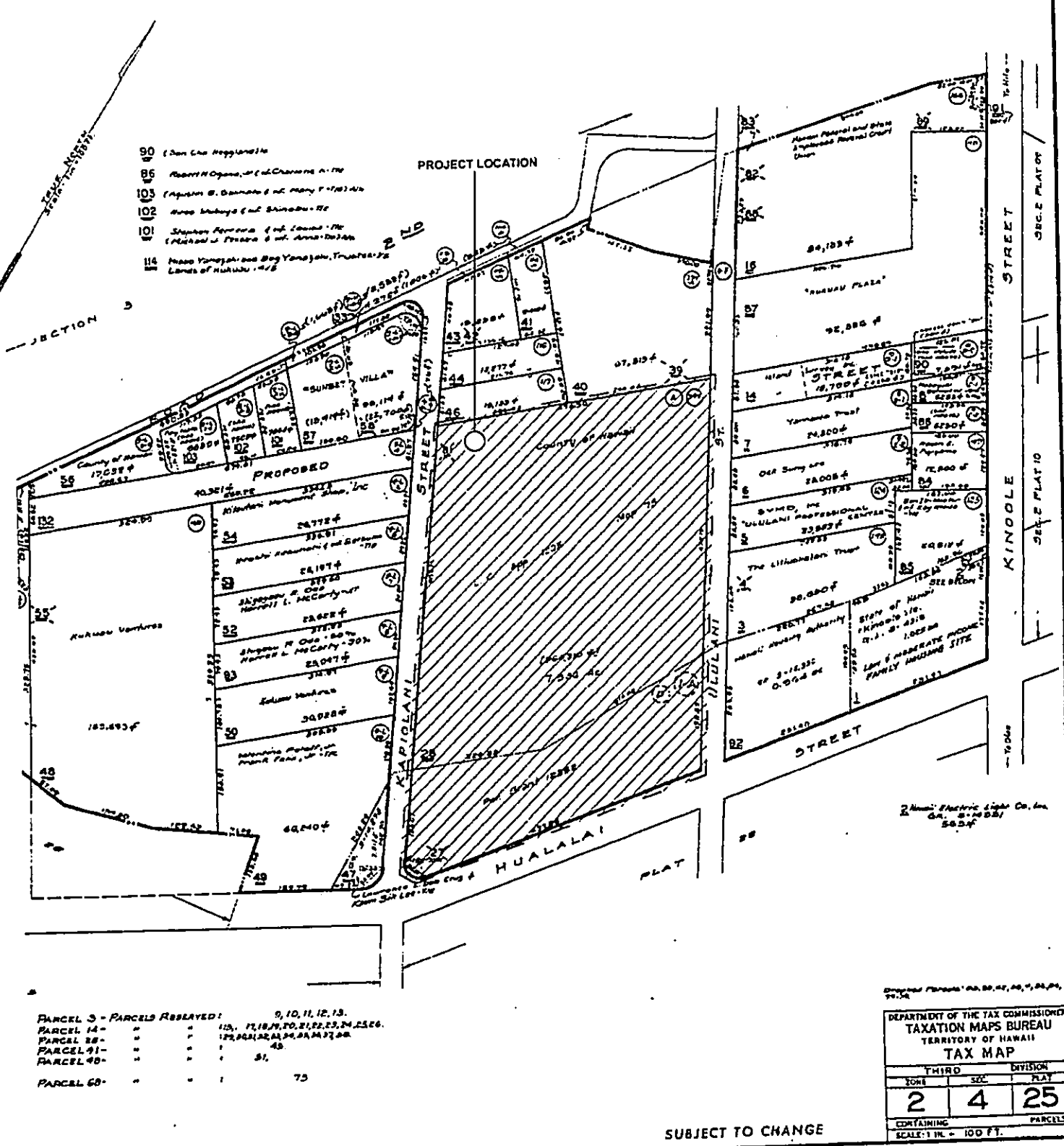


FIGURE 21A
Public Safety Building / Location Map
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



Source: USGS Hilo Quadrangle



LEGEND

-  = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR
-  = PROJECT LOCATION

FIGURE 21B
Public Safety Building / TMK: 2-4-25:28

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



NOT TO SCALE

Source: County of Hawaii Tax Map Key

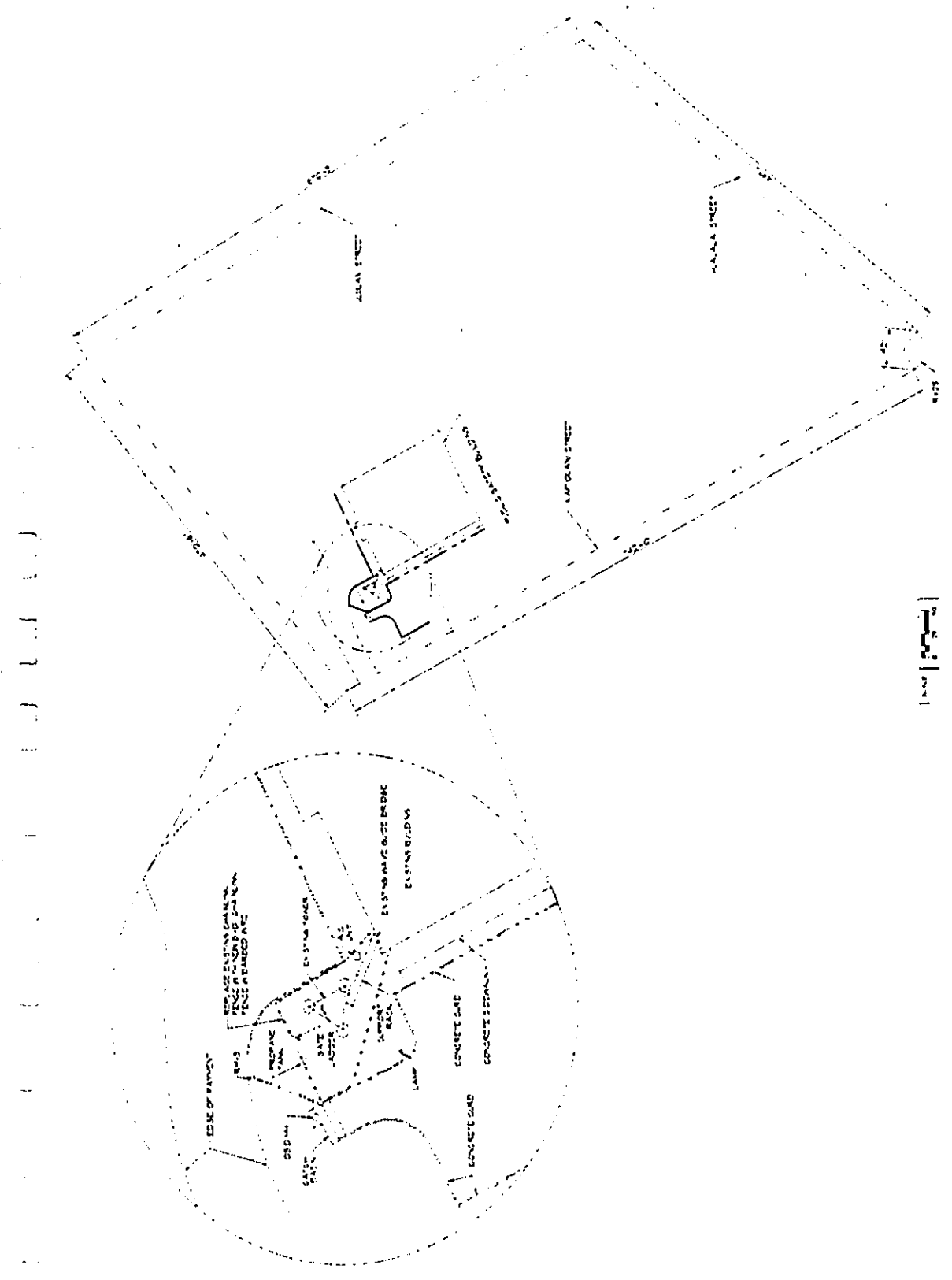
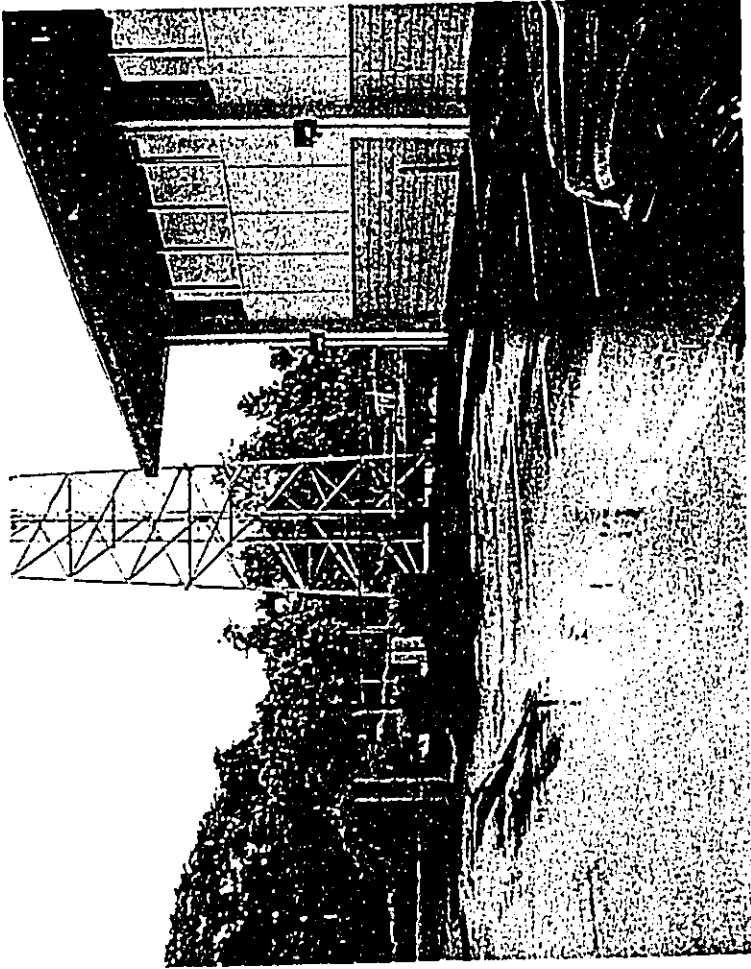


FIGURE 21B-1
 Public Safety Building / Boundary Plan
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



June 2003



Existing Tower to be Refurbished

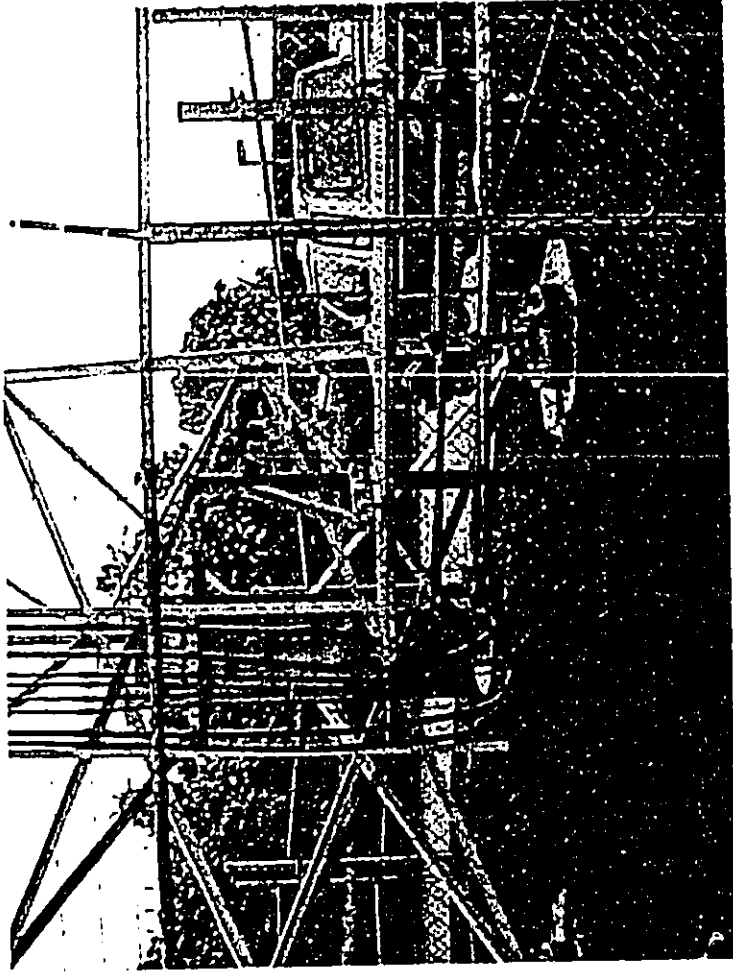


FIGURE 21C
Public Safety Building / Site Photos

**COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES**

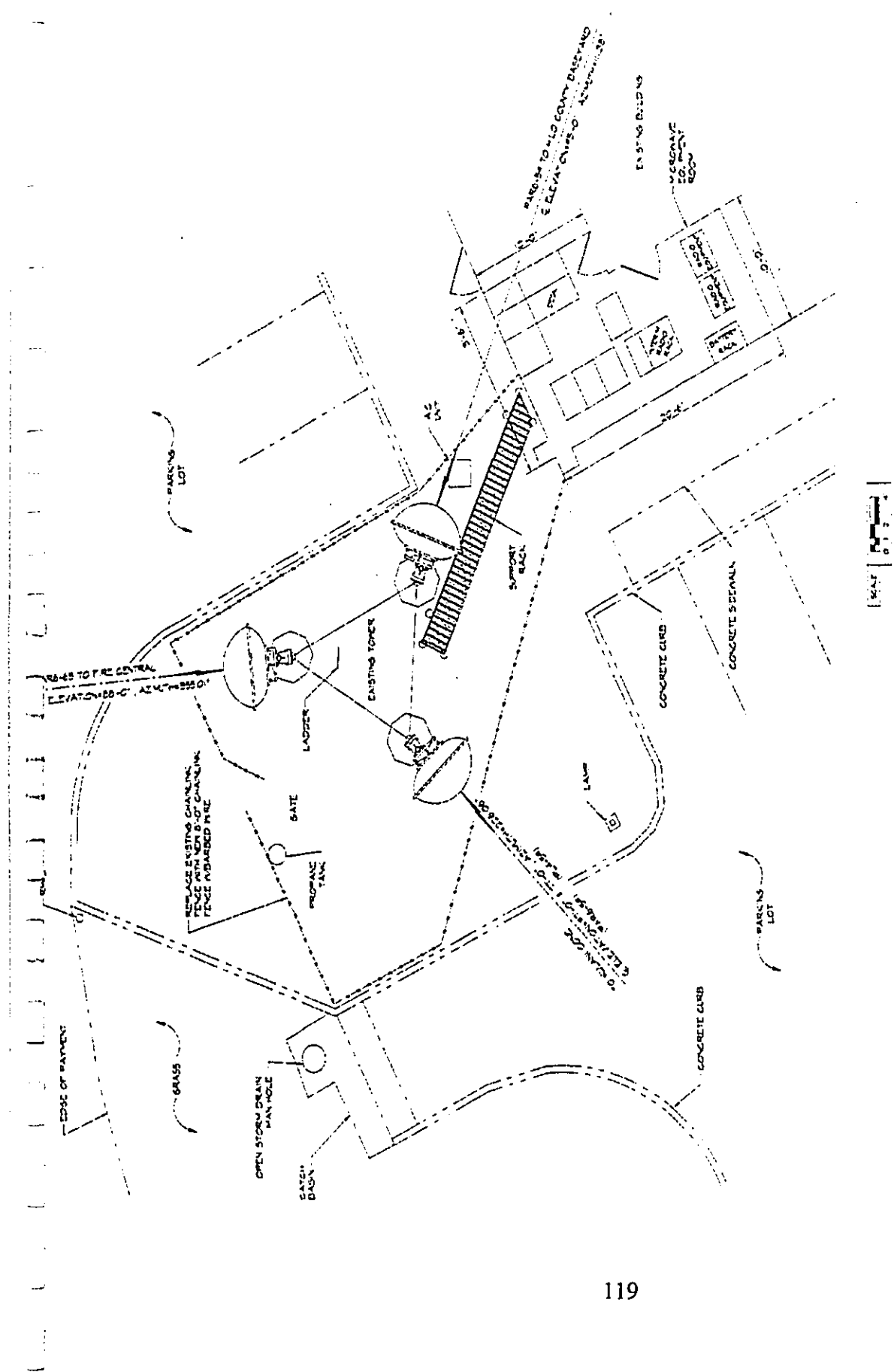


FIGURE 21D
Public Safety Building / Site Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



June 2003

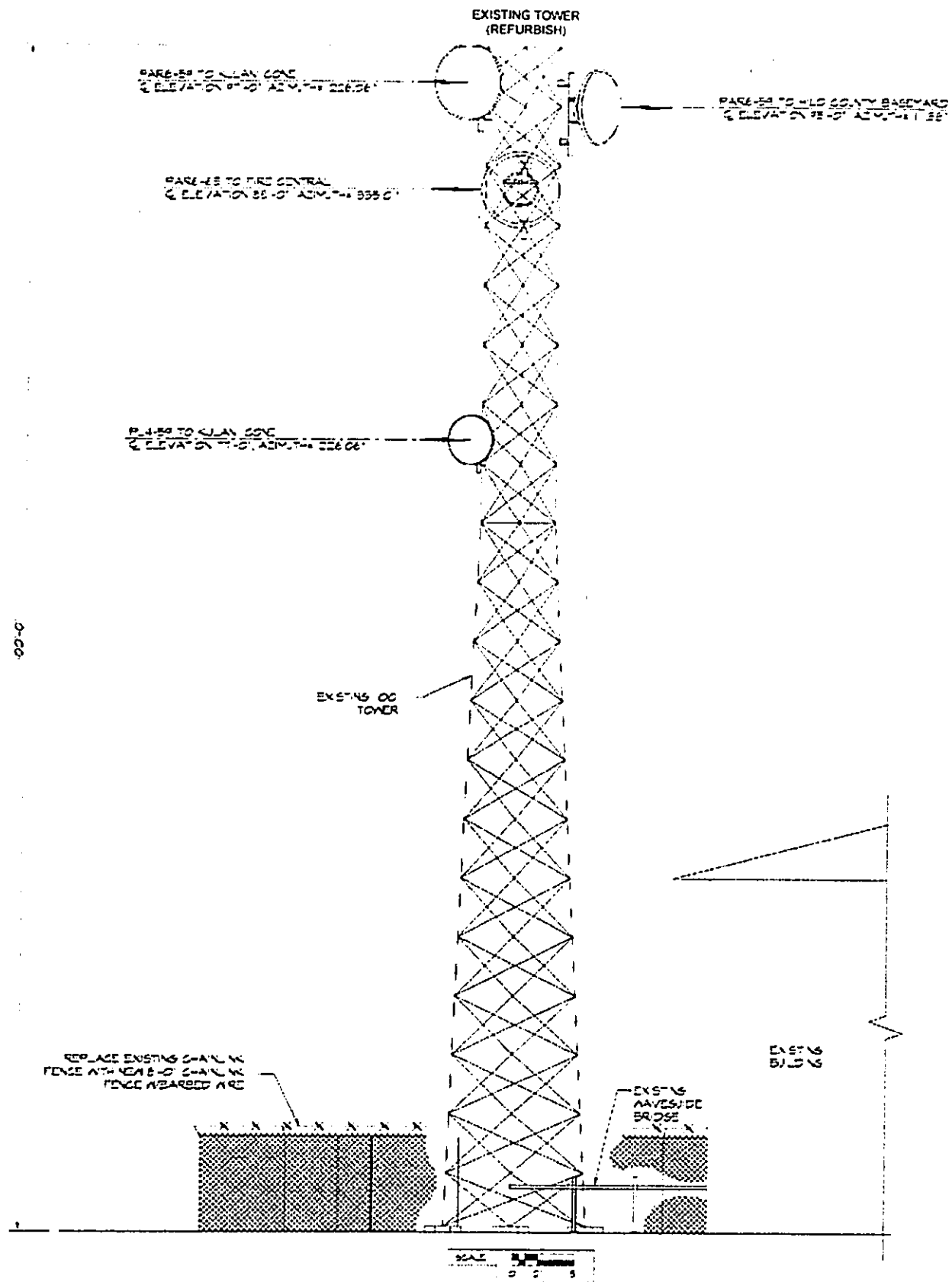


FIGURE 21E
Public Safety Building / Elevation Plan (looking north)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.18 Puna Police Station

Location/Access. The Puna Police Station is located on Old Volcano Road at the corner of Pilima Street in the town of Keaau, in the Puna District. The site is accessed from the Keaau-Pahoa Road, Mamalahoa Hwy, and the Old Volcano Highway into Keaau. The property is identified as TMK 1-6-143:038. Figure 22A shows the site location on the USGS quadrangle map. Figure 22B identifies the site on the TMK map and Figure 22B-1 depicts a boundary plan. Site photographs are provided in Figure 22C.

Existing System. This is a microwave terminal site (spur) to service the Keaau Police Station. The microwave radio is located in the police building and the 30-ft tower is installed at the right front of the building adjacent to the Old Volcano Highway. Tall trees on adjacent properties obstruct the microwave path and negatively affect the signal.

Proposed Improvements. The new radio facility will be approximately 40 feet northeast of the existing facility. The following improvements will be made to this site:

- New 100-ft monopole tower
- New outdoor radio cabinet; radio equipment, batteries and charger
- One (1) new parabolic antenna
- New generator and propane tank
- New 8-ft high chain link fence (approx. 30 ft x 30 ft)

Path. The Puna Police Station facility provides a spur path to/from Kulani Cone via an antenna at 95 feet above ground.

Figures 22D and 22E show the site and elevation plans, respectively.

Co-Locater. None

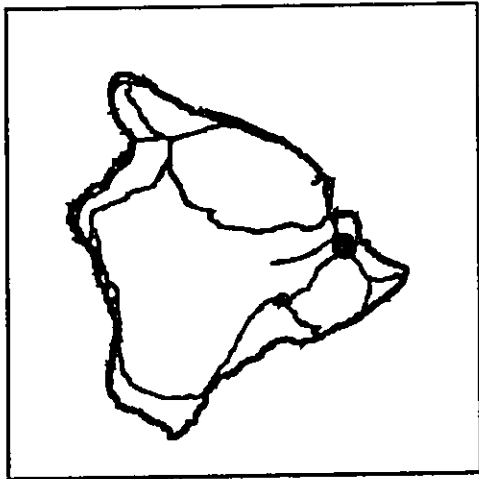
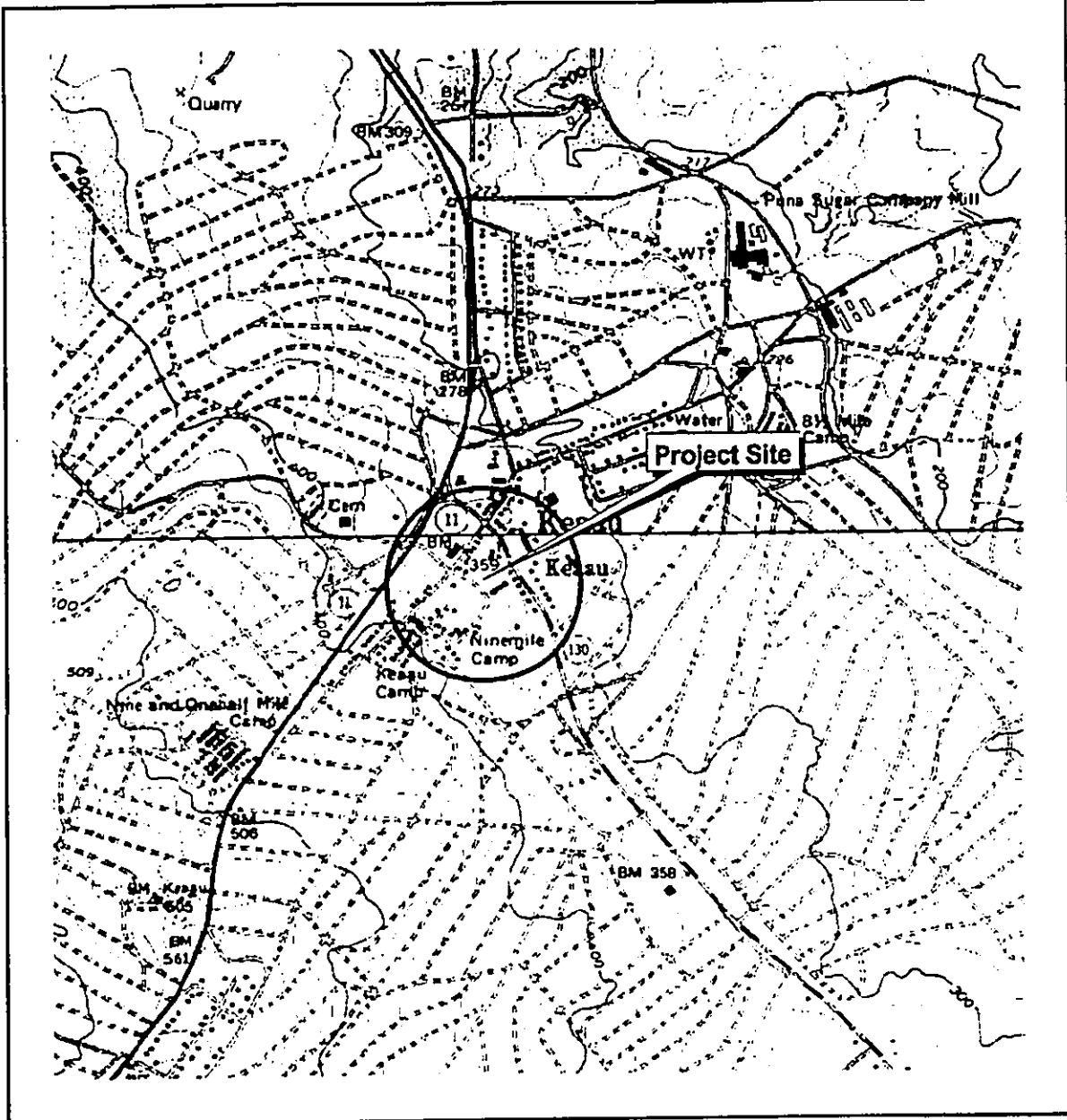
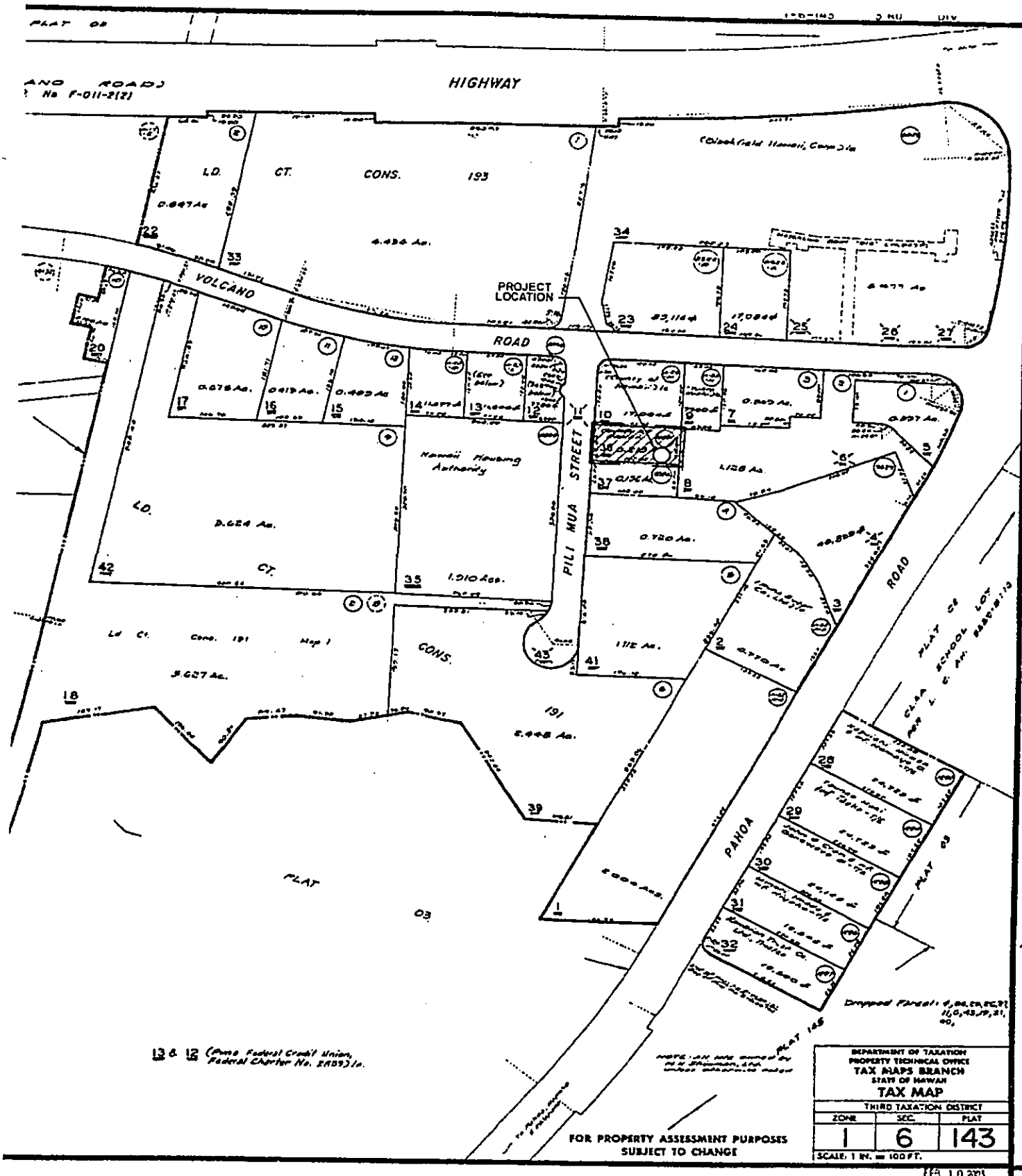


FIGURE 22A
 Puna Police Station / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



DOCUMENT CAPTURED AS RECEIVED



LEGEND

= LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR

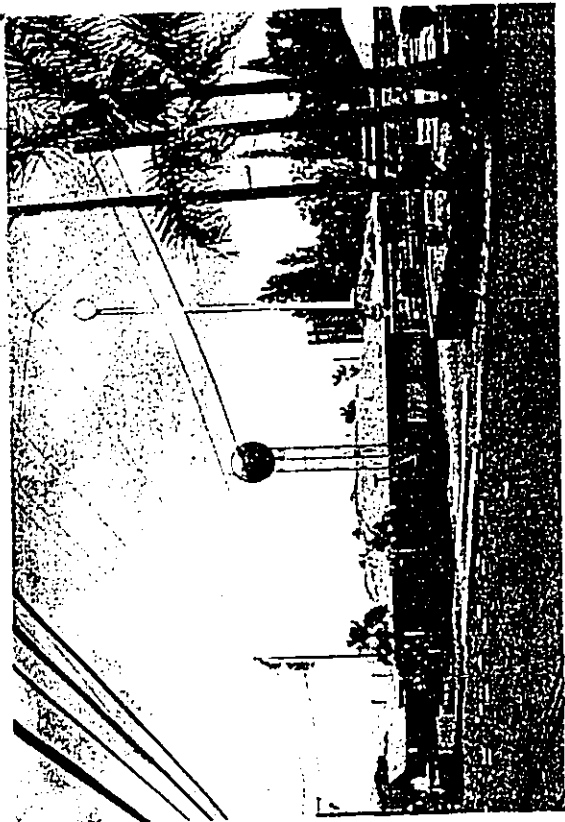
= PROJECT LOCATION

FIGURE 22B
 Puna Police Station / TMK: 1-6-143:36

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

Source: County of Hawaii Tax Map Key





Existing Tower with Photo-Simulation of New Monopole Tower

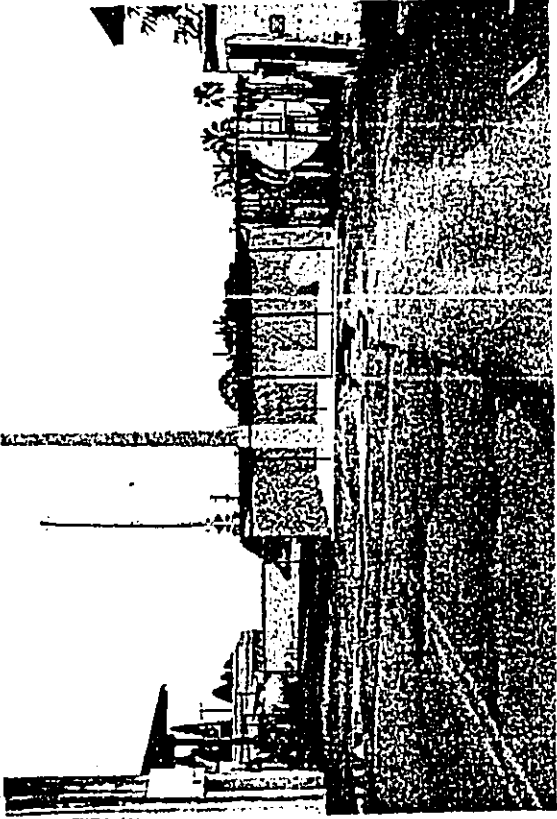
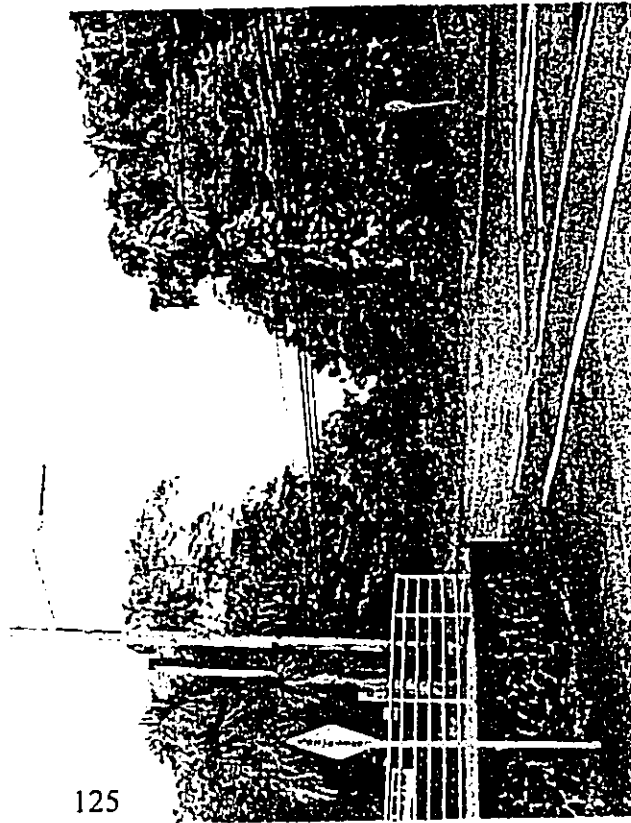


Photo Simulation of New Facilities Enclosed in Chain-link Fence

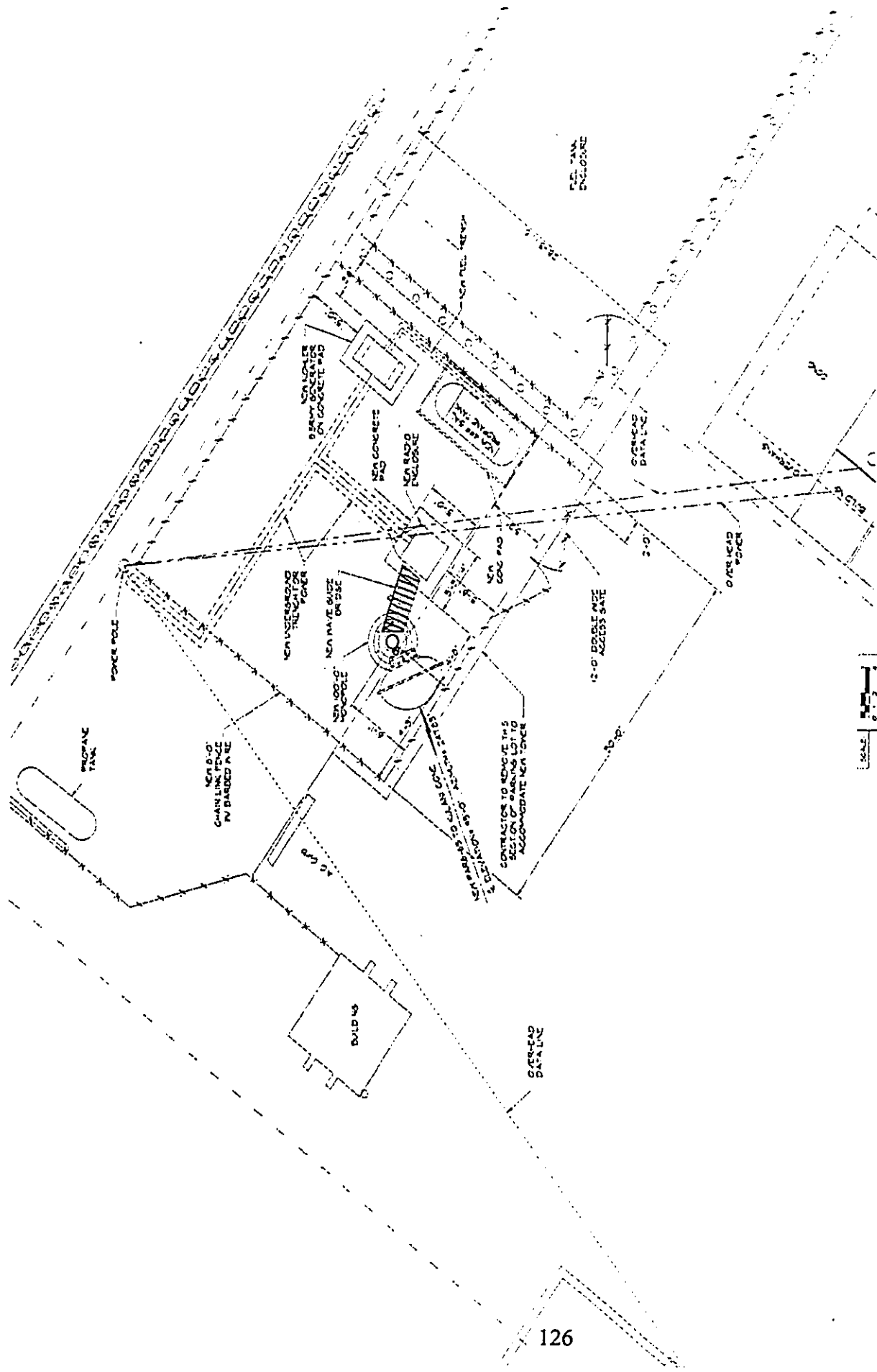


FIGURE 22C
Puna Police Station / Site Photos
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

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Trees Obstructing Existing Tower



126

FIGURE 22D
Puna Police Station / Site Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



Source: Scientel America, Inc.

June 2003

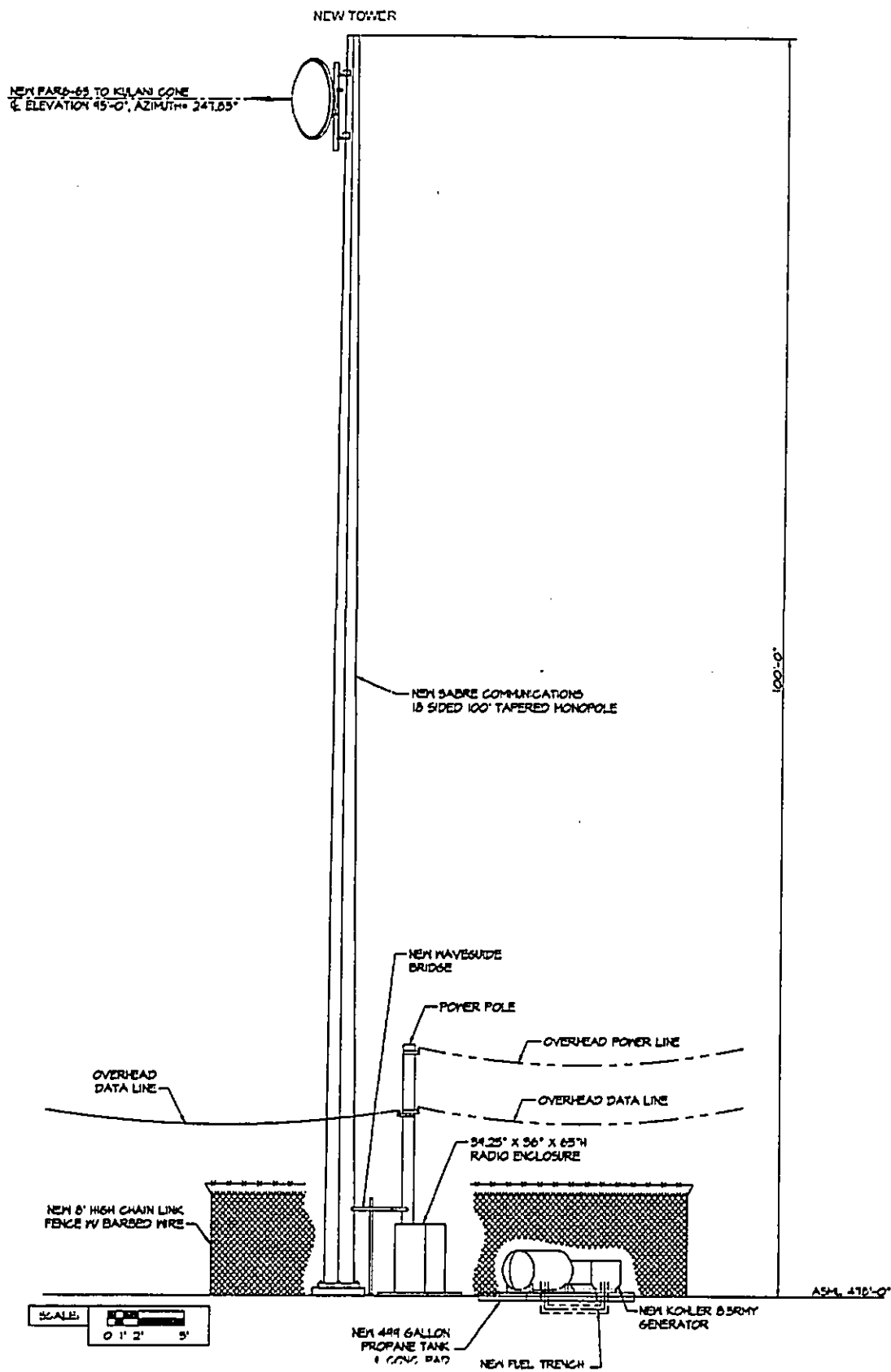


FIGURE 22E
Puna Police Station / Elevation Plan (looking north)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.19 South Point

Location/Access. The South Point site is located on pastureland to the west of South Point Road, in the land division of Pakini in the Kau district. Access to the site is via Mamalahoa Highway and South Point Road. At this location are two other guyed telecommunications tower facilities. The property is identified as TMK 9-3-001:006. Figure 23A shows the site location on the USGS quadrangle map. Figure 23B identifies the site on the TMK map. Site photographs are provided in Figure 23C.

Existing System. The existing tower at South Point is an 80-ft tall self supporting unit. The tower structure, equipment shelter, and propane tank are enclosed in a 35 ft x 40 ft chain link fence.

Proposed Improvements. The new facility will be approximately 40 feet to the north of the existing facility. The following improvements will be made to this site:

- New 80-ft self supporting tower
- New shelter to house digital radio equipment, batteries and charger
- Two (2) new parabolic antenna
- New generator and propane tank
- New 8-ft high chain link fence (approx. 30 ft x 35 ft)

Path. South Point provides a repeater path northeast to Naalehu Pasture via an antenna at 75 feet above ground and a repeater path west to Kauna Point via an antenna at 75 feet above ground.

Figures 23D and 23E show the site and elevation plans, respectively.

Co-Locater. DLNR, EMS, FBI, HVO, NOAA, PBS, HELCO

- 21-ft Fiberglass whip and yagi antennas

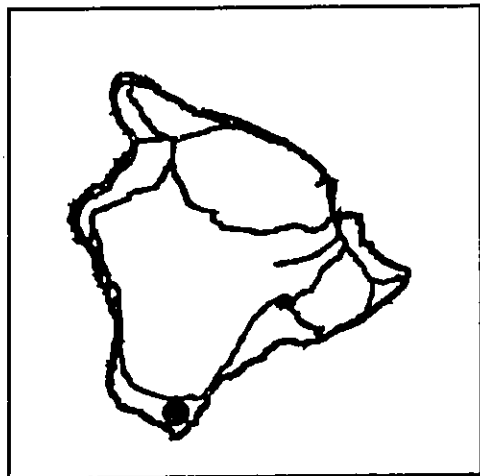
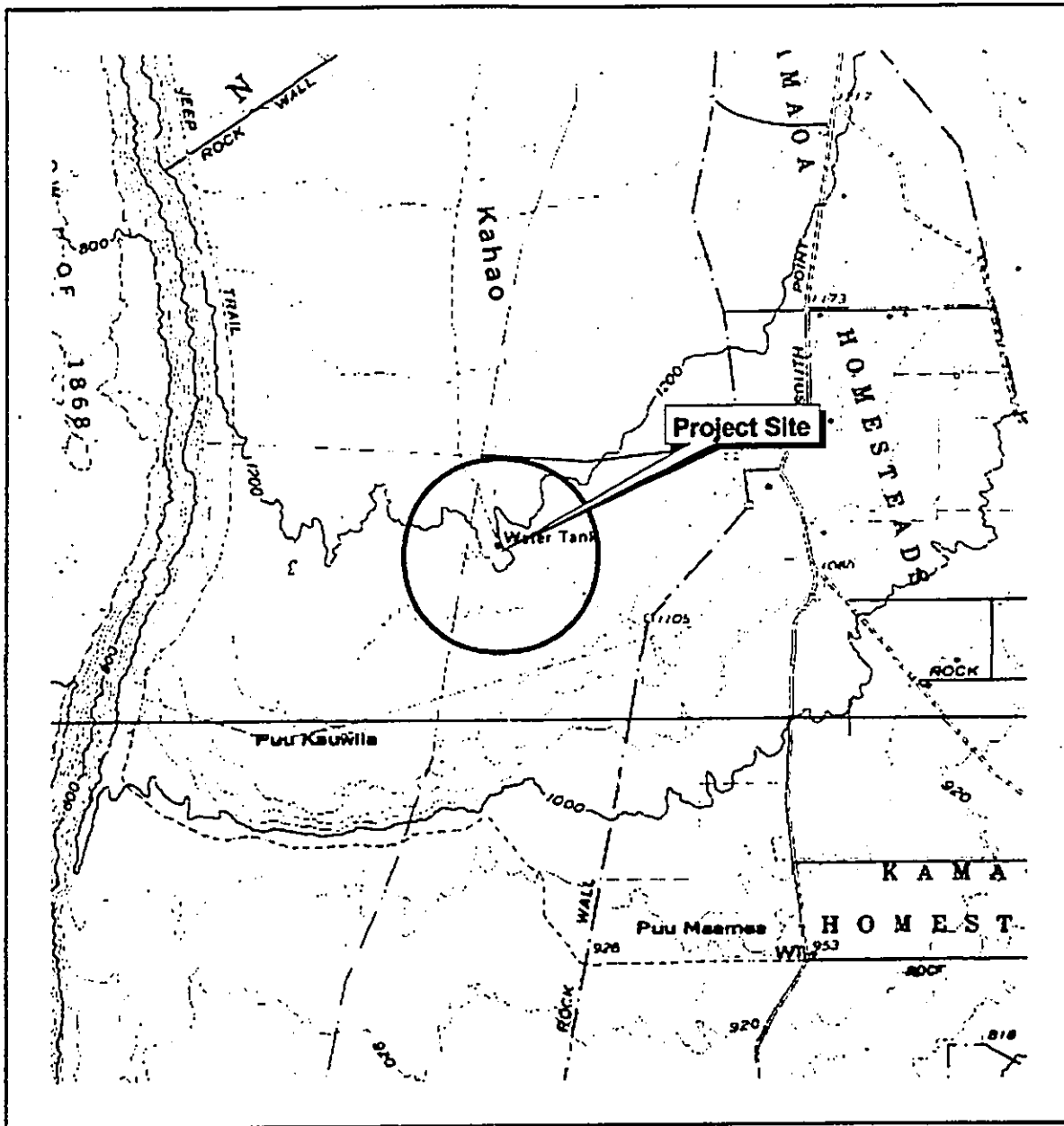


FIGURE 23A
 South Point / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES



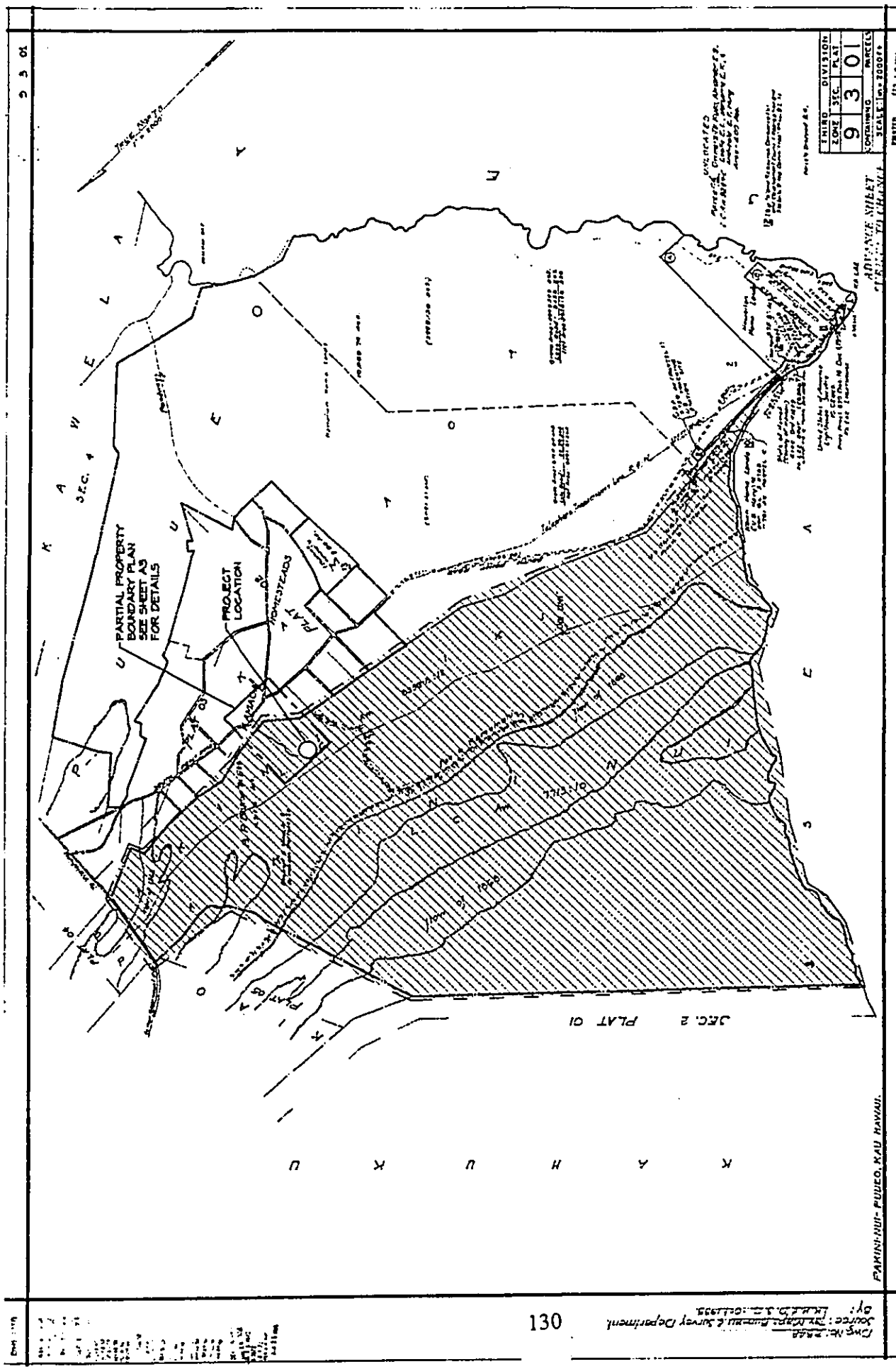


FIGURE 23B
South Point / TMK: 9-3-01:06



COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



NOT TO SCALE

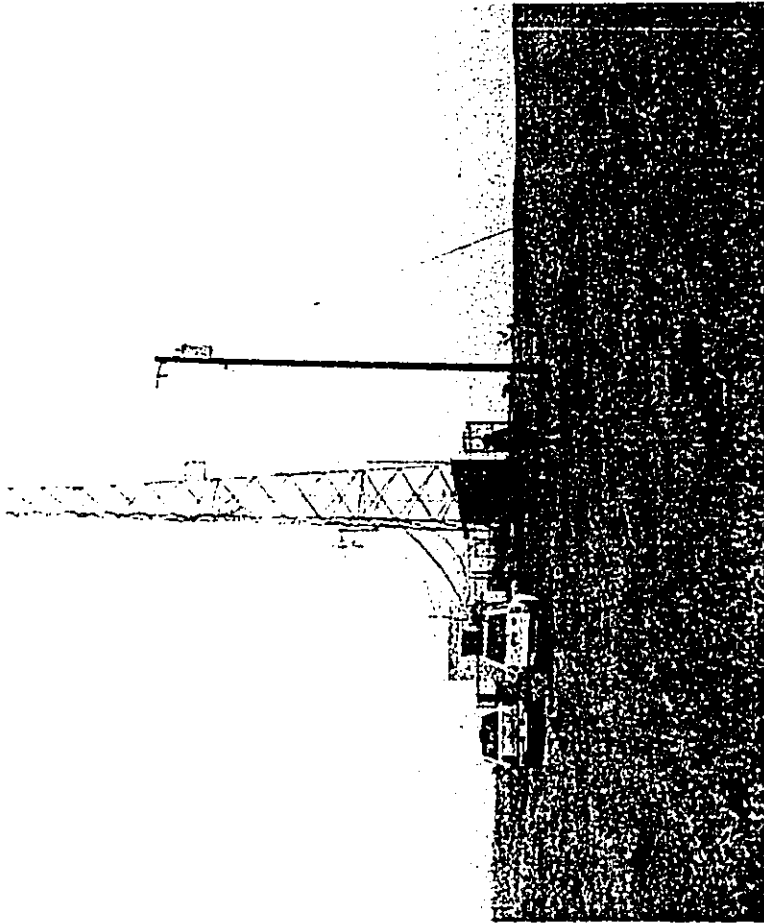


June 2003

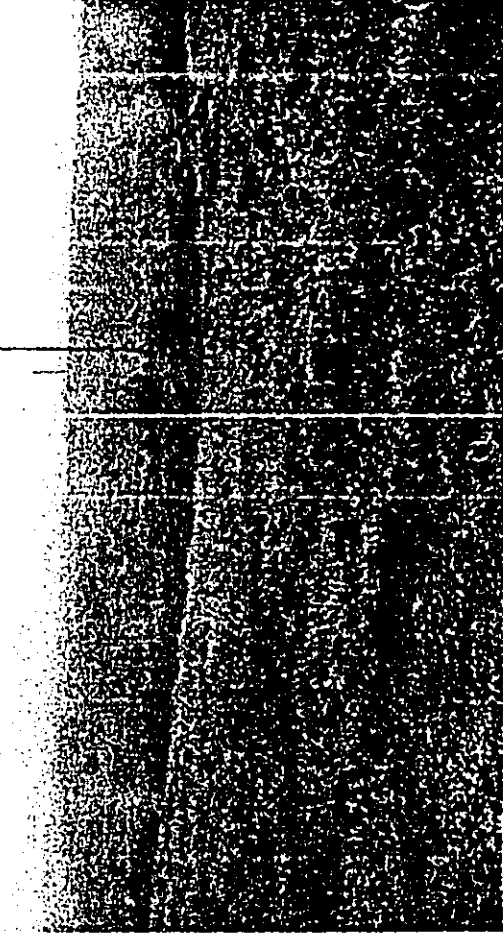
- LEGEND**
-  = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR
 -  = PROJECT LOCATION

Source: County of Hawaii Tax Map Key

Source: Planning, Survey & Survey Department
Date: 12/10/2003



Replacement Tower Site in Front of Existing Tower



Pasture Lands and HELCO Power Lines

FIGURE 23C
South Point / Site Photos

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



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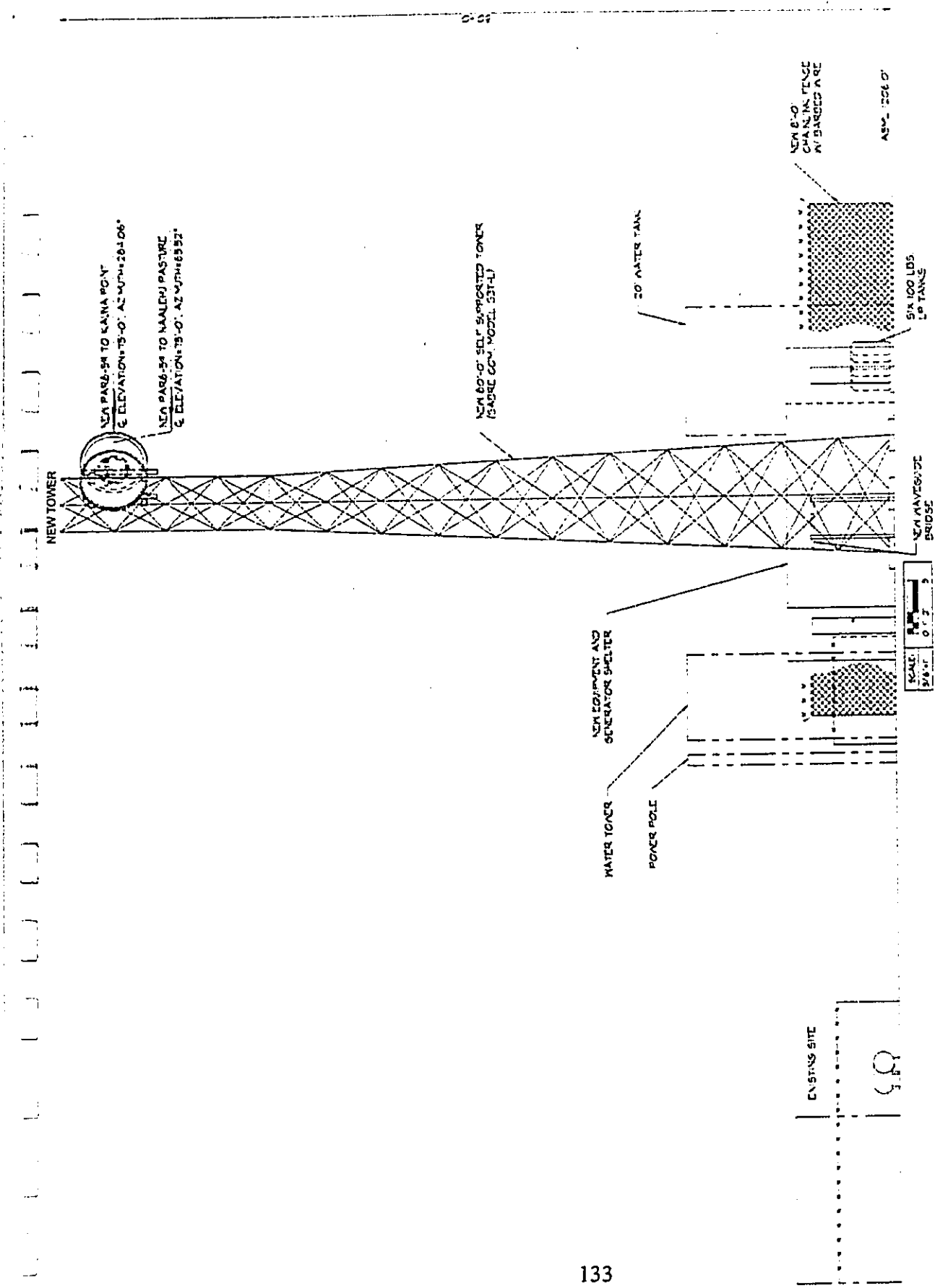


FIGURE 23E
South Point / Elevation Plan (looking west)
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



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COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.7.20 Waimea Police Station

Location/Access. The Waimea Police Station is within the civic center complex located in Waimea, in the South Kohala district. The civic center also includes the Waimea Fire Station. Access is from Mamalahoa Highway. The property is identified as TMK 6-7-002:011. Figure 24A shows the site location on the USGS quadrangle map. Figure 24B identifies the site on the TMK map and Figure 24B-1 depicts a boundary plan. Site photographs are provided in Figure 24C.

Existing System. The existing tower at the Waimea Police Station is a 120-ft self-supporting tower. The microwave radio equipment is installed within the police building. There is no separate radio shelter at the tower. An unused existing 40-ft tower at this location will be removed.

Proposed Improvements. The existing tower has been tested to be structurally sound and will be reused.

- Use existing 120-ft self-supporting tower
- One (1) new parabolic antenna
- New outdoor radio equipment cabinet
- Use existing site generator and fuel tank
- New chain link fence (approx. 20 ft x 40 ft)

Path. The Waimea Police Station is a spur path from Huehue Ranch via antennas at 105 feet and 85 feet above ground.

Figures 24D and 24E show the site and elevation plans, respectively.

Co-Locater. None

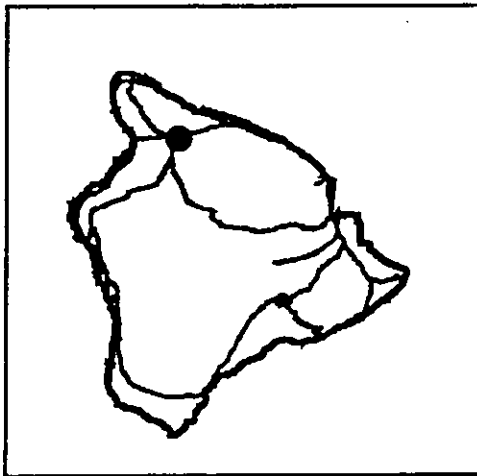
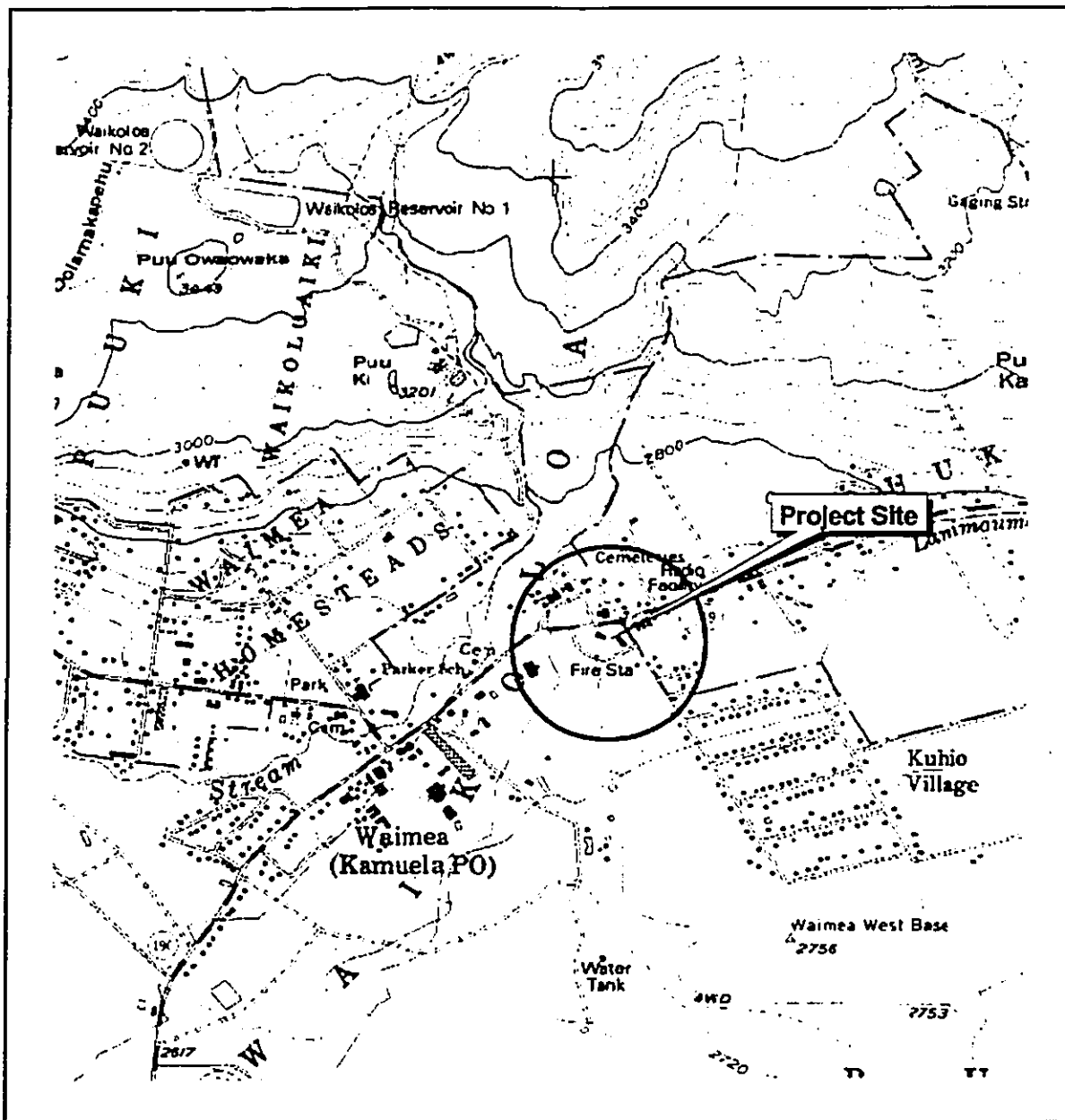
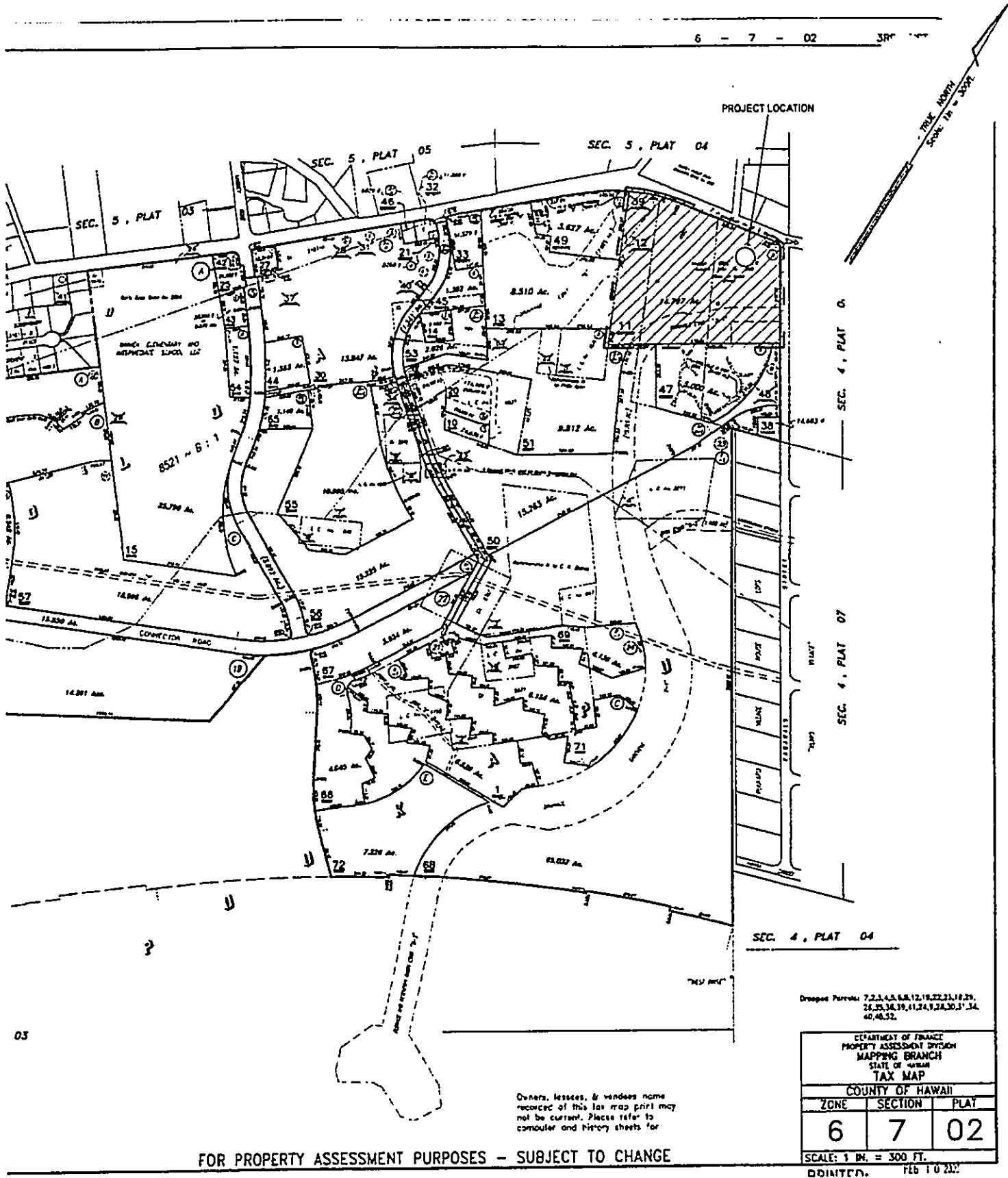


FIGURE 24A
 Waimea Police Station / Location Map
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES





LEGEND

-  = LOCATION OF PARCEL WHERE CONSTRUCTION IS TO OCCUR
-  = PROJECT LOCATION

Source: County of Hawaii Tax Map Key

FIGURE 24B
Captain Cook Police Station / TMK: 6-7-02:11

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



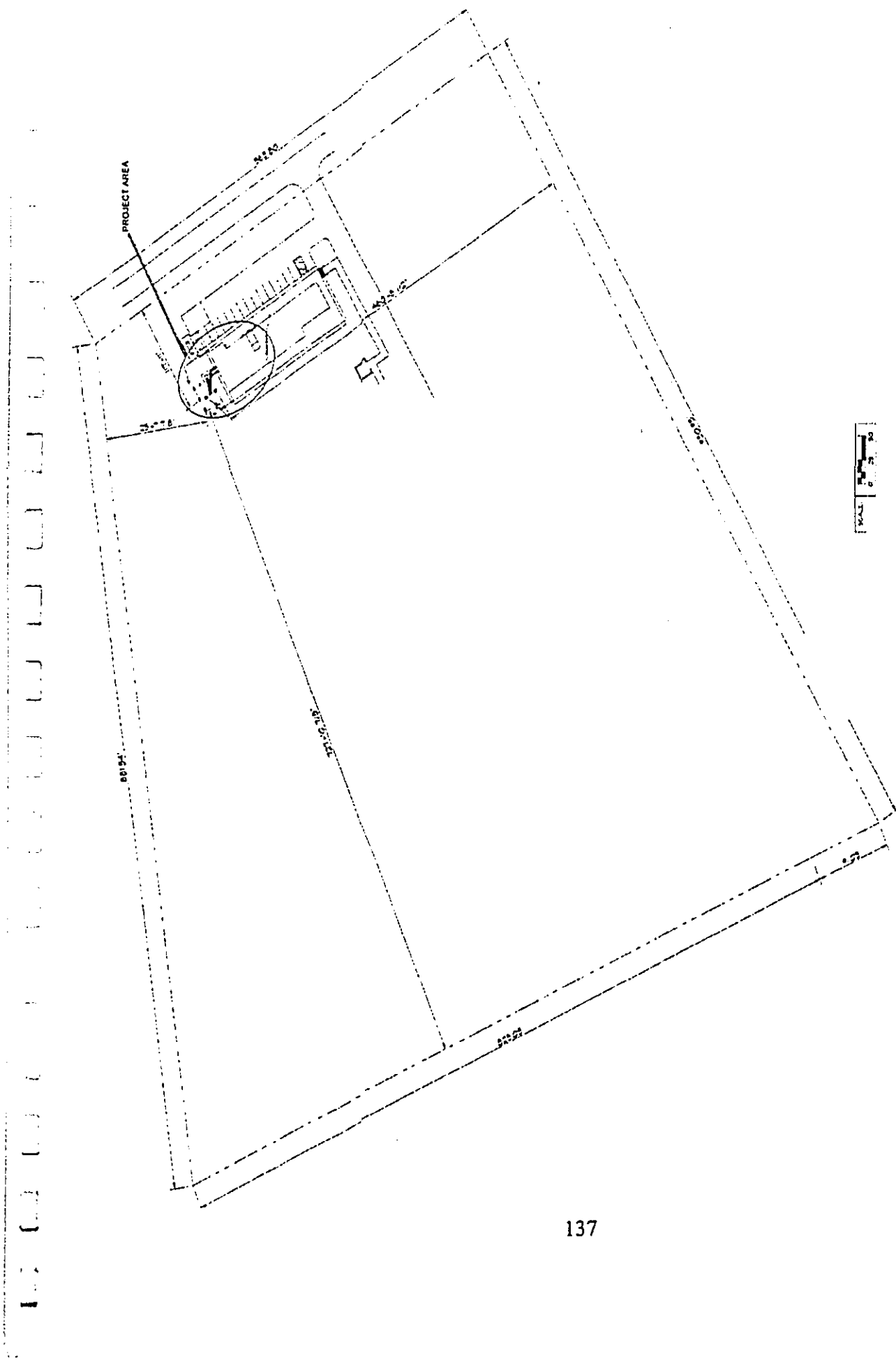
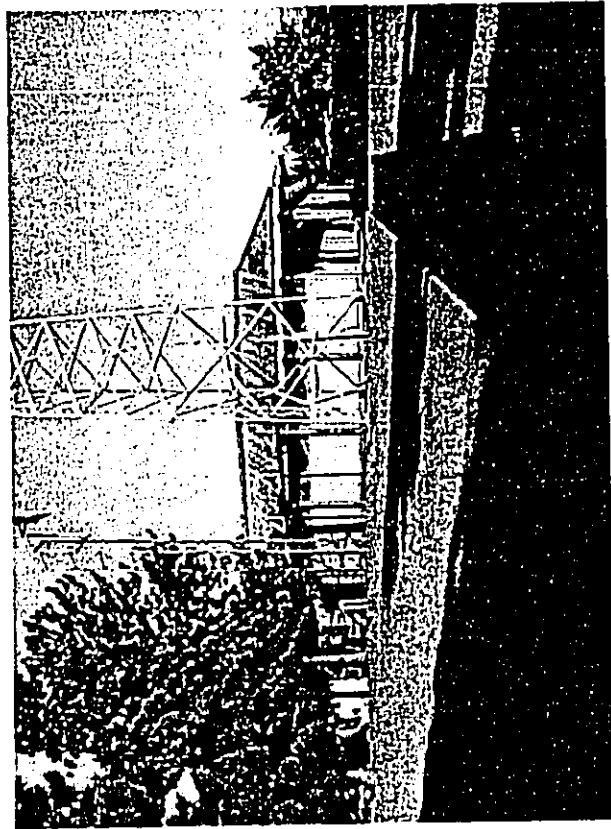


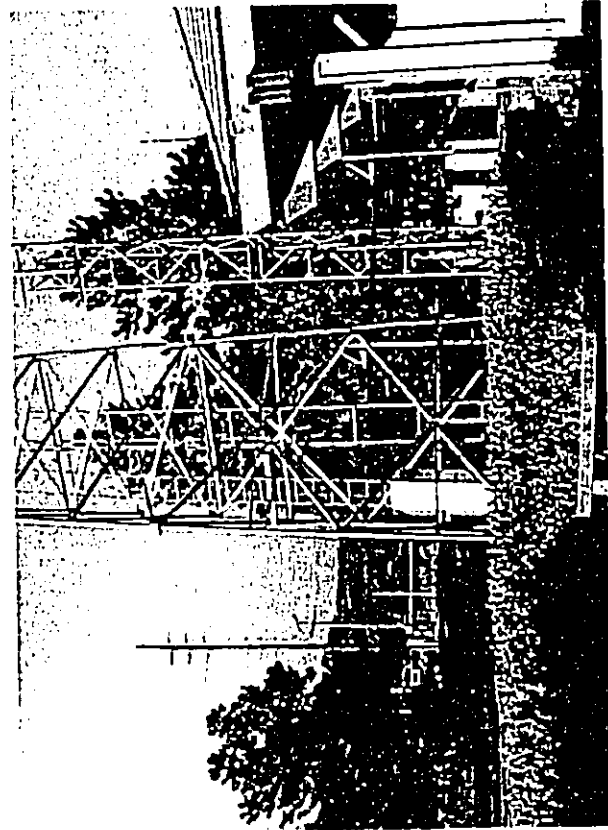
FIGURE 24B-1
Waimea Police Station / Boundary Plan
COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES



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Existing Tower Adjacent to Police Station to be Refurbished



Short Tower to be Removed

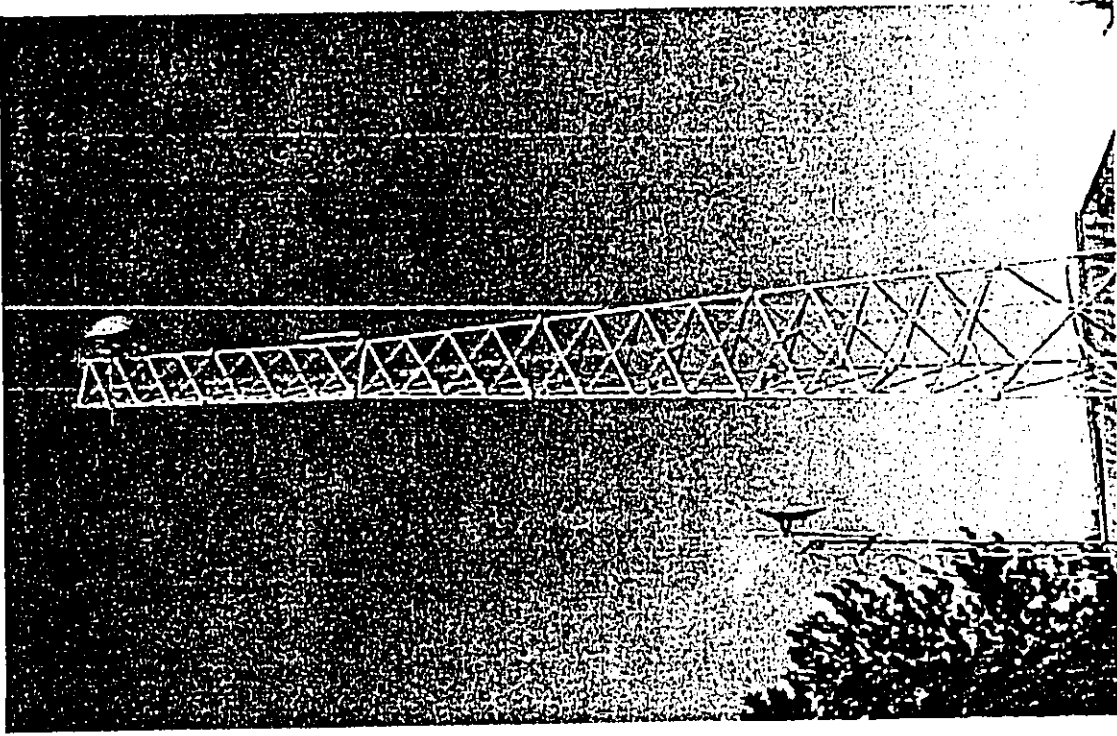


FIGURE 24C
 Waimea Police Station / Site Photos
 COUNTY OF HAWAII
 EMERGENCY RADIO FACILITIES

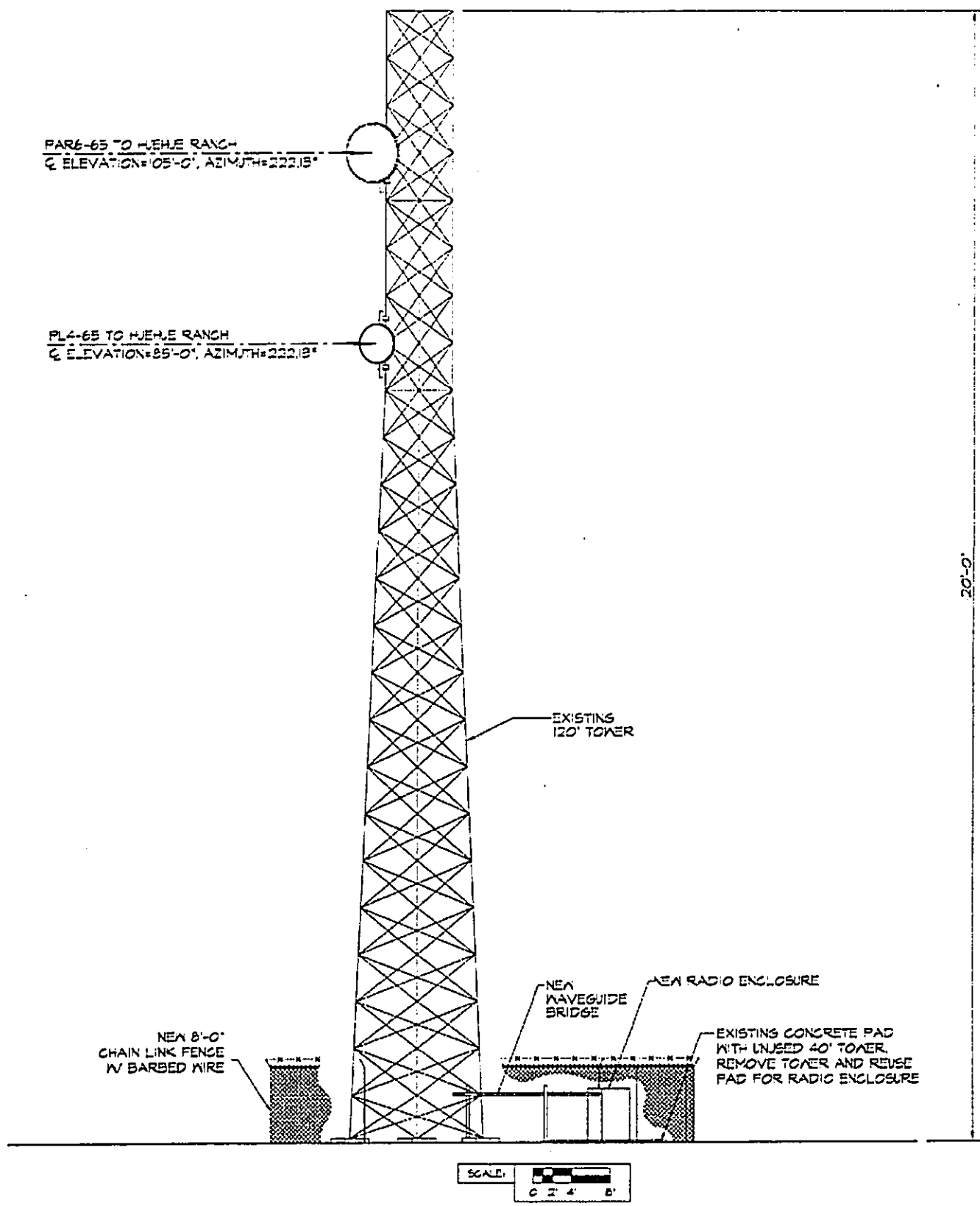


FIGURE 24E
 Waimea Police Station / Elevation Plan (looking north)

COUNTY OF HAWAII
EMERGENCY RADIO FACILITIES

COUNTY OF HAWAII
DIGITAL UPGRADE MICROWAVE PROJECT
(EMERGENCY RADIO FACILITIES)

2.8 NON-COUNTY CO-LOCATER AGENCIES

2.8.1 Co-Locating Agencies

The proposed improvements to the County's radio facilities are vital for police and fire functions. In addition, the upgraded facilities will also allow the existing users who are co-located at the County's facilities and new public agency users to share the facilities at several locations. HELCO and PBS are already represented at several sites. Public agencies that are expected to co-locate include state and federal agencies, as shown in Table 3.

Table 3. Proposed Co-Locaters on the County System

	DLNR	DOT	EMS	PACMERS	NOAA	FBI	HVO	HELCO*	PBS**
Captain Cook Police Station							HVO		
Fire Central									
Hamakua Police Station									
Hilo Baseyard	DLNR			PACMERS	NOAA	FBI		HELCO	
Huehue Ranch				PACMERS					
Iolehachae	DLNR	DOT				FBI			
Kahua Ranch***	DLNR	DOT	EMS			FBI		HELCO	
Kailua Police Station									
Kamehameha Park									
Kau Police Station									
Kauna Point									
Kulani Cone		DOT	EMS	PACMERS		FBI		HELCO	
Moanuaheha						FBI			
Naalehu Pasture	DLNR	DOT	EMS					HELCO	
Ohia Mill	DLNR	DOT	EMS			FBI		HELCO	
Public Safety Building									
Puna Police Station									
South Point	DLNR		EMS		NOAA	FBI	HVO	HELCO	PBS
Waimea Police Station									

- * HELCO has been a co-locater with the County since 1976 at several facilities.
- ** PBS has been a co-locater since the late 1980's at several County facilities.
- *** County and other agencies will co-locate on the replacement State DAGS facility at Kahua Ranch.

2.8.2 Public Agency and Existing Co-Locaters

2.8.2.1 State of Hawaii Department of Land and Natural Resources (DLNR)

The personnel of the DLNR are responsible for managing more than 900,000 acres of state lands. DLNR staff serves as conservation officers as well as firefighters for state wild lands. Within DLNR, radio users come primarily from the Division of Forestry and Wildlife (DOFAW) and the Division of Conservation and Resource Enforcement (DOCARE).

DOFAW:

- Manages state-owned forest reserves, natural area reserves, public hunting areas, and plant and wildlife sanctuaries
- Oversees several program areas that include watershed protection, native resources protection, outdoor recreation, and commercial forestry
- Issues hunting permits

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DOCARE:

- Enforces all state laws and rules involving state lands, parks, historic sites, forest reserves, aquatic life and wildlife areas, coastal zones, conservation districts, state shores, as well as County ordinances involving County parks
- Enforces laws relating to firearms, ammunition, and dangerous weapons

2.8.2.2 State Department of Transportation (DOT)

State wide, DOT's objective is public safety. On the Big Island DOT is responsible for maintaining all state highways, including drainage, culverts, and bridges. DOT also responds to traffic accidents, oil spills, land slides, and other similar problems. During major disasters, DOT must coordinate its efforts with other county, state, and federal agencies. Therefore, improving the county communications system is vital.

2.8.2.3 Department of Health - Emergency Medical Services (EMS)

The state-wide Medical Communications System (Medicom) is primarily used for communications between medic units and hospital emergency rooms for online medical control operations. The State Department of Health contracts the Hawaii County Fire Department (HCFD) to provide emergency medical services on the Big Island. There are five medical facilities, and HCFD has 15 medical units and two control vehicles with Medicom radios. Communications are handled through the fire radio system. Therefore, updating this emergency radio system is vital to the efficiency of EMS.

2.8.2.4 United States Department of the Army Pacific Mobile Emergency Radio System (PACMERS)

PACMERS is a United States Pacific Command (USPACOM)-sponsored program with United States Army, Pacific (USARPAC) serving as the appointed Executive Agent. PACMERS is designated as the Joint Rear Area Commander's (JRAC) primary Command & Control (C2) communications platform to ensure emergency communications for first-responders to weapons of mass destruction and counter-terrorism activities, homeland security, consequence management (CM), as well as other situations derived by civil disobedience or natural disaster.

JRAC-HI Operational Order (OPORD) dated 7 May, 2002 states: "JRAC-HI coordinates security operations with service components and federal, state and local agencies, in order to detect, deter or defeat terrorist threats or attacks, and conduct consequent management and provide military support to civil authorities in support of Homeland Defense of the State of Hawaii." This initiative complies with Office of Management and Budget's (OMB) Federal Enterprise Architecture Program and specifically supports Presidential Priority Initiative #15 Project Wireless Public Safety Interoperable Communications (SAFECOM).

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2.8.2.5 United States Department of Commerce National Oceanic and Atmospheric Administration (NOAA)

The National Weather Service is part of NOAA and broadcasts weather reports from its South Point transmitter, which is used mainly by the marine community in that area. The 100-W transmitter uses an omni directional whip antenna mounted on a 20-ft pole at the corner of the fence, which surrounds the tower.

2.8.2.6 United States Federal Bureau of Investigation (FBI)

The FBI is responsible for national security. Counterintelligence, counterterrorism, criminal investigations, and law enforcement are specific responsibilities. Co-location at the County communications facilities will significantly support FBI functions throughout the Big Island, which will ensure efficiency in inter- and intra-agency radio communications.

2.8.2.7 United States Geological Survey (USGS)–Hawaii Volcanoes Observatory (HVO)

HVO enhances public safety and reduces losses from volcanic events through effective forecasts and warnings of volcanic hazards based on a comprehensive understanding of volcanic processes. Many government agencies, the private sector, the public, universities, and the global community use HVO warnings, expertise, and products. Effective radio communications are essential in providing real-time field reports and warnings to the various agencies responsible for public safety. Consequently, co-locating HVO communications equipment with the County is necessary.

2.8.2.8 Hawaii Electric Light Company (HELCO)

HELCO is a public utility responsible for generating and providing electricity throughout the Big Island. HELCO's co-location objective on the County's communication system is to reach facilities where HELCO does not have the necessary infrastructure. These communication paths are used by HELCO to monitor and control generation, transmission, and distribution facilities.

2.8.2.9 Public Broadcasting System Hawaii (PBS)

The Hawaii Public Television Foundation is a private, not-for-profit organization, whose sole purpose is to ensure the longevity of PBS Hawaii. PBS Hawaii broadcasts free over-the-air, non-commercial television programming originating in Honolulu via a network of transmitters and translators, thus serving 98 percent of Hawaii's population.

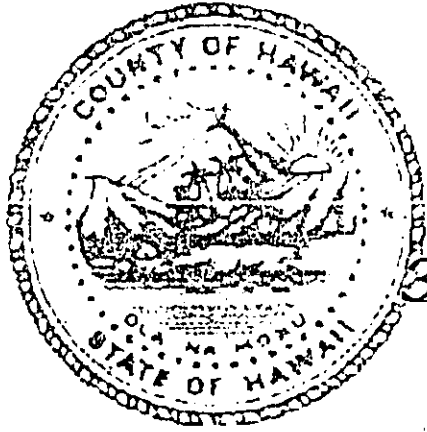
The signal is transmitted in Honolulu on Channel 11, received on Maui and rebroadcast on Channel 10. This signal is transmitted to the Big Island at Honohina and relayed sequentially to Hilo, Kilauea Military Camp, Naalehu, and South Point. Each site consists of a receive antenna (Scala PR-TV) and a transmit antenna (Scala 4DR-8-2HW). Included in the equipment to be put on County property is a 100-W translator. This translator takes in the received signal and changes the frequency to another channel to avoid interference with itself, then reamplifies the signal, and sends it to the transmitting antenna. There are two runs of transmission lines—one

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from the receive antenna to the translator and the other from the translator to the transmitting antenna. All specifications of the antennas have been relayed to the Hawaii Police Department and to Scientel with whom PBS Hawaii has contracted to relocate its antennas from the old to the new towers.

2.8.3 Future Co-Location Opportunities

The County's emergency radio infrastructure is diverse and extensive over the island within all judicial districts and from near sea level to 8,000 ft MSL. The County recognizes the value of co-location, especially at remote sites to minimize the impacts on the environment by reducing the number of tower facilities versus duplicating unnecessary facilities. The County is therefore interested in providing opportunities for collaboration with other public agencies and commercial entities in the future.



3. LAND USE CONFORMANCE

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3.0 LAND USE CONFORMANCE

3.1 OVERVIEW OF STATE AND COUNTY ZONING STATUS AND REQUIREMENTS

The County of Hawaii emergency radio system is comprised of 19 island-wide facilities in various State land use and County zoning districts. The land use and zoning districts, existing and new tower heights, and the required permits are summarized in Table 4.

Table 4. Site Summary of State Land Use and County Zoning Requirements

Site	State Land Use	County General Plan	County Zoning	Existing Tower Height	New Tower Height	Permit Requirement
Captain Cook Police Station	Urban	Med Density	A-1a	40 ft (ss) *	50 ft (ss)	Plan Approval
Fire Central	Urban	High Density	CG-7.5	30 ft (roof-guy)	90 ft (ss)	Plan Approval
Hamakua Police Station	Urban	Med Density	RS-7.5	80 ft	100 ft (mp) **	Plan Approval
Hilo County Baseyard	Urban	High Density	MG-1a	100 ft (ss)	100 ft Refurbish	Plan Approval
Huehue Ranch	Agricultural	Extensive Agriculture	A-5a	100 ft	100 ft Refurbish	Plan Approval
Iolehaehae	Agricultural	Extensive Agriculture	A-40a	40 ft (ss)	50 ft (ss)	Special Permit
Kahua Ranch (Construction by State / DAGS)	Agricultural	Intensive Agriculture	A-20a	40 ft (guy)	60 ft (ss)	Special Permit
Kailua Police Station	Conservation	High Density	Open	80 ft (ss)	100 ft (ss)	CDUA
Kamehameha Park	Urban	Low Density	RS-15	110 ft (mp)	140 ft (mp)	Plan Approval
Kau Police Station	Agricultural	---	A-20a	---	90 ft (ss)	Plan Approval
Kau State Bldg (Demolition Only)	Urban	---	CV-10	45 ft	---	Plan Approval
Kauna Point	Conservation	Conservation	Open	160 ft	160 ft Refurbish	CDUA
Kulani Cone	Conservation	Open	---	160 ft (guy)	250 ft (ss)	CDUA
Moanuaiea	Conservation	Extensive Agriculture	---	60 ft (ss)	80 ft (ss)	CDUA
Naalehu Pasture	Agricultural	Extensive Agriculture	A-20a	50 ft (ss)	100 ft	Special Permit
Ohia Mill	Agricultural	Orchard	A-5a	100 ft (ss)	150 ft	Special Permit
Public Safety Building	Urban	High Density	RM-1	100 ft (ss)	100 ft Refurbish	Plan Approval
Puna Police Station	Urban	High Density	CV-10 & RS-15	30 ft	100 ft (mp)	Plan Approval
South Point	Agricultural	Extensive Agriculture	---	80 ft	80 ft (ss)	Special Permit
Waimea Police Station	Agricultural	Medium Density	A-40a	120 ft	120 ft Refurbish	Plan Approval

* self-supporting tower

** monopole tower

There are eight (8) sites in the Urban district; seven (7) are located in the State agricultural district; and four (4) are located in the State Conservation district.

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Nine (9) of the sites are located at public facilities (i.e., police or fire stations or civic centers). New facilities will be constructed at 14 sites and the remaining five will be refurbished. All towers will ultimately be owned by the County of Hawaii, with the exception of the Kahua Ranch facility, which is being constructed by State DAGS.

3.2 STATE OF HAWAII

3.2.1 Chapter 343, Hawaii Revised Statutes

Compliance with Chapter 343, HRS is triggered by the use of County and State lands, County funds, and State Conservation District lands. Over the past 30 years, some of the facilities have been described in environmental assessments; however, the system as a whole has not been previously described. The subject EA serves to bring all of the facilities, which comprise the backbone of the County of Hawaii emergency radio facilities, into compliance with Chapter 343, HRS.

3.2.2 Conservation District Sites

Four of the 19 facilities are situated on land designated within the State Conservation District. The facilities are at the following sites: Kailua Police Station, Moanuaiea, Kulani Cone, and Kauna Point.

A Conservation District Use Application (CDUA) is being submitted to request BLNR approval.

3.3 COUNTY OF HAWAII

3.3.1 General Plan

The General Plan designations for the 19 locations are noted in Table 4 and includes urban designations (Low, Medium, and High Density); agricultural designations (Orchard, Extensive, and Intensive Agriculture).

3.3.2 Zoning

As noted in Table 4 above the facilities are located in various zoning districts:

- Residential (RS-7.5, RS-15/ Single Family; and RM-1 /Multi-Family)
- Commercial (CG-7.5/ General Commercial and CV-10/ Village Commercial)
- Industrial (MG-1a /General Industrial)
- Agricultural (A-1a, A-5a, A-20a, A-40a)
- Open

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3.3.3 Plan Approval

Review and approval of plans for new structures and additions to existing structures, and certain uses in specified zoning districts, is required to assure that the intent and purpose of Chapter 25, Hawaii County Zoning Code (1996) are carried out.

3.3.4 Site Plan Review

Use of land within a State Land Use agricultural or rural district other than for an agricultural or rural use may petition the Planning Commission for permission by submitting a Special Permit petition.

3.4 FEDERAL COMPLIANCE

3.4.1 Federal Communications Commission (FCC)

The FCC regulates all broadcasting facilities under the Code of Federal Regulations, par. 74, including telecommunications facilities - antennas, towers, and other accessory structures for radio frequency (RF) transmissions. All of the facilities in the County emergency radio system therefore, require registration and approval by the FCC.

3.4.2 Federal Aviation Administration (FAA)

Facilities which are proximate to airport facilities or exceed 200 feet in height require FAA review. FAA Form 7460-1 is required for those sites in the proximity of an airport and the TOWAIR program (on the FCC web page) identifies them requiring the 7460-1 and FCC registration.

Table 5A. TOWAIR Program Identification and Evaluation of Sites Requiring Form 7460-1 Review

Site	Criteria	FAA Determination
Fire Central	Proximity to Hilo International Airport	No Hazard
Hilo County Baseyard	Proximity to Hilo International Airport	No Hazard
Kamehameha Park	Proximity to Upolu Airport	No Hazard
Kulani Cone	Structure will be taller than 200 feet	Marking or Lighting required pursuant to FAA Advisory Circular 70/7460-1K
Public Safety Building	Proximity to Hilo International Airport	Pending Determination (as of 08/21/03)
Waimea Police Station	Proximity to Waimea-Kohala Airport	Pending Determination (as of 08/21/03)

In addition, at FAA's request, Notice of Construction or Alteration (FAA Form 7460-1) will also be submitted for review and evaluation for the Hamakua Police Station, Naalehu Pasture, and South Point sites to determine frequency compatibility with FAA radio facilities.

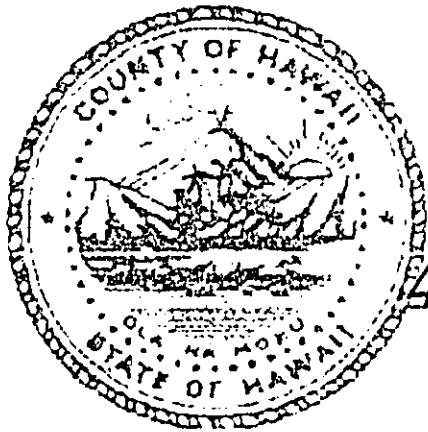
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3.5 SUMMARY OF PERMITS AND APPROVALS

Table 5 identifies the responsible authority for the various required permits and approvals.

Table 5. Required Permits and Approvals

Permits	Responsible Authority	Sites
COUNTY PERMITS		
<p>-Plan Approval</p> <p>Plan Approval is required for the facilities which are in the State Urban District – various County zoning districts</p>	Planning Commission	<ul style="list-style-type: none"> - Captain Cook Police Station - Fire Central - Hamakua Police Station - Hilo County Baseyard - Kamehameha Park - Public Safety Building - Puna Police Station - Waimea Police Station <p>Agricultural District Sites</p> <ul style="list-style-type: none"> - Huchue Ranch - Kau Police Station
<p>-Special Permit</p> <p>Special Permit is required for facilities which are in the State Agricultural District</p>	Planning Commission	<ul style="list-style-type: none"> - Iolehaehae - Kahua Ranch (by State DAGS) - Naalehu Pasture - Ohia Mill - South Point <p>Special Permits Previously Approved</p> <ul style="list-style-type: none"> - Huehue Ranch - Kau Police Station
<p>-Building Permits</p> <p>All new construction requires Building Permit</p>	Building Division	All Sites
STATE PERMITS		
<p>-Conservation District Use Permit</p> <p>Facilities which are in the State Conservation District require CDUP</p>	Board of Land and Natural Resources	<ul style="list-style-type: none"> - Kailua Police Station - Kauna Point - Kulani Cone - Moanuaiahea
FEDERAL COMPLIANCE		
<p>-FCC Registration</p>	Federal Communications Commission	All sites
<p>-FAA Compliance</p> <p>Facilities which are proximate to airport facilities or exceed 200 feet in height require FAA review and compliance.</p>	Federal Aviation Authority	<ul style="list-style-type: none"> - County Baseyard - Fire Central - Kamehameha Park - Kulani Cone (criteria: height) - Public Safety Building



4. DESCRIPTION OF THE ENVIRONMENT,
POTENTIAL IMPACTS, AND MITIGATIVE
MEASURES

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4.0 DESCRIPTION OF THE ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIVE MEASURES

The facilities in this project are distributed throughout the island in diverse locations and environments. The discussion which follows categorizes the general and site specific environments of the 19 facilities which comprise the County's radio system. Section 4.1 describes the broad environments by land use categories and Section 4.2 describes site specific conditions of the 19 facilities.

4.1 DESCRIPTION OF THE OVERALL ENVIRONMENT

The radio sites occur throughout the island and are located in various land use districts that are classified by the State as Urban, Agricultural, and Conservation. As shown in Table 6, eight sites are in the Urban District, seven are in the Agricultural District, and four are in the Conservation District. In general, these land use designations are consistent with the physical environments of each site, with the exception of Kailua Police Station which is classified Conservation but is more characteristic of an urban environment.

Table 6. Radio Facilities Categorized by State Land Use District

State Land Use District	Radio Facility Sites	Notes
Urban	Captain Cook Police Station* Fire Central Hamakua Police Station * Hilo County Baseyard (Refurbish) Kamehameha Park Public Safety Building (Refurbish) Puna Police Station Waimea Police Station* (Refurbish)	*Captain Cook Police Station, Hamakua Police Station, and Waimea Police Station are in Civic Center complexes.
Agricultural	Huehue Ranch (Refurbish) Iolehaehae Kahua Ranch** Kau Police Station*** Naalehu Pasture Ohia Mill South Point	**The Kahua Ranch facility is a State DAGS project; County will co-locate its antenna and equipment. *** The new radio facility at Kau Police Station will replace an existing facility at the Kau State Building at the Naalehu Civic Center.
Conservation	Kailua Police Station**** Kauna Point (Refurbish) Kulani Cone Moanuaiahea	****Kailua Police Station site is in an urban setting, however, the property is classified as Conservation.

The following discussion broadly describes the environments, potential impacts and mitigation measures for the urban and rural town sites. The Conservation and Agricultural sites are collectively described as the "rural sites".

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4.1.1 Physical Environment

Existing Environment

The island of Hawaii is larger than all the islands of the archipelago combined, and with its greater mass and higher elevations it has more distinctive climatic zones and ecosystem types than can be found elsewhere in the state. Topographically, the mountains of Kohala, Mauna Kea, Hualalai, and Mauna Loa form the interior of the island and slope towards the sea. The elevations range from a high of 13,796 feet at the summit of Mauna Kea to sea level.

The 19 sites occupy a broad range of environments (each is described specifically in Section 4.2), the highest elevation site is Iolehaehae on the eastern slopes of Mauna Kea at 8,121 feet. The sites loop around the island (as shown in Figure 1) to provide emergency radio coverage for every district in the County as shown in Table 7.

Table 7. Distribution of Sites by County Districts

District	Sites
North Kohala	Kamehameha Park Kahua Ranch (State DAGS facility)
South Kohala	Waimea Police Station
Hamakua	Hamakua Police Station
North Hilo	Iolehaehae
South Hilo	Fire Central Hilo County Baseyard Public Safety Building
Puna	Puna Police Station
Kau	Kau Police Station Kau State Building (Demolition Site) Kauna Point Kulani Cone Naalehu Pasture South Point
South Kona	Captain Cook Police Station Ohia Mill
North Kona	Huehue Ranch Kailua Police Station Moanuaheha

By necessity, telecommunications facilities which operate as point-to-point line-of-sight systems require higher elevations within the locality. Generally, these high spots offer good natural drainage conditions and thus, none of the sites is associated with any drainages, floodways, or wetlands.

All sites are in FEMA FIRM Zone X except for two sites which are in Zones X and AE. These two are Fire Central in Hilo and Waimea Police Station. Fire Central is also in the tsunami inundation zone.

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Impacts and Mitigation Measures

There are no surface water sources on any project site. There will be no discharges from the project site directed to waters of the U.S. or waters of the State of Hawaii.

As mapped by FEMA on the FIRM boundary maps, the Fire Central site is adjacent to the Alenaio Stream drainage channel and the Waimea Police Station is in the vicinity of the Lanimaumau Stream and designated in Zone X with AE floodway (base flood elevations determined). All other sites are in Zone X which are areas of 500-year floods with average depths of less than 1 ft or areas protected by levels from 100-year floods.

With the exception of Fire Central, all sites are at elevations above the tsunami inundation area. The Fire Central facility will be designed as required by the County.

Temporary erosion control measures will be used during construction to prevent runoff to nearby areas. These mitigation measures will include placement of straw or hay bales and erection of a silt fence to prevent surface runoff into adjacent areas. These measures will contain surface flows within the project site during the construction period.

The impact area at each site will be limited to the fenced area and the immediate surrounding area. The sites would be cleared and graded to construct the radio shelter and tower foundation. Erosion controls measures appropriate for each location would be specified on the construction plans and implemented by the contractor.

4.1.2 Hazardous Conditions

Existing Conditions

The island of Hawaii is associated with volcanic eruptions and earthquakes. The US Geological Service (USGS) has developed guidance for potential lava-flow hazard zones with a numerical rating of 1 to 9, with 1 having the greatest risk. Table 8 explains each zone and lists the 19 site locations and their respective zone classification.

Table 8. Lava-Flow Hazard Zones

Zone	Explanation	Sites
1	Includes the summit and rift zones of Kilauea and Mauna Loa where vents have been repeated active in historic time.	None
2	Areas adjacent to and downslope of active rift zones.	Kauna Point Ohia Mill South Point
3	Areas gradationally less hazardous than Zone 2 because of greater distance from recently active vents and/or because the topography makes it less likely that flows will cover those areas.	Captain Cook Police Station Fire Central Hilo Baseyard Kulani Cone Public Safety Building Puna Police Station

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Zone	Explanation	Sites
4	Includes all of Hualalai, where the frequency of eruptions is lower than on Kilauea or Mauna Loa. Flows typically cover large areas.	Kailua Police Station Moanuaiea Huehue Ranch
5	Areas currently protected from lave flows by the topography of the volcano.	None
6	Same as- Zone 5.	Kau Police Station Naalehu Pasture
7	20 percent of this area covered by lava 3,500-5,000 years ago.	Iolehaehae
8	Only a few percent of this area covered in the past 10,000 years.	Hamakua Police Station Waimea Police Station
9	No eruption in this area for the past 60,000 years.	Kahua Ranch Kamehameha Park

The entire island of Hawaii is designated in Seismic Zone 4. All planned facilities will be designed in accordance with the Uniform Building Codes (UBC) adopted by the County of Hawaii.

The State of Hawaii has been affected twice in the past two decades by devastating hurricanes, Iwa in 1982 and Iniki in 1992. While it is difficult to predict these natural occurrences, it is reasonable to assume that future events could be likely. The site locations, as the rest of the island and state, is vulnerable to the destructive winds and torrential rains associated with hurricanes.

Potential Impacts and Mitigation Measures

The fundamental purpose of the planned improvements to the County's emergency radio system is to modernize the communications system to aid public agency first responders to disasters such as earthquakes, eruptions, tsunami, floods, and hurricanes. Hawaii island is vulnerable to these natural hazards and must rely on an efficient radio system for their public safety functions. While a number of the sites are in lava-flow hazard zones 2 and 3, the loop system is designed to continue transmission of information.

All new structures including towers and equipment shelters are designed according to the UBC adopted by the County and will sustain winds up to 110 miles per hour.

4.1.3 Botanical Resources

All 19 facilities are within previously graded sites and all (except Kau Police Station) have existing towers and equipment onsite. The footprint of each new facility will generally be adjacent to the existing facilities. Field studies to assess the botanical resources were completed on the seven sites that are in the more remote Conservation or Agricultural areas. The seven sites are: Iolehaehae, Kauna Point, Kulani Cone, Moanuaiea, Naalehu Pasture, Ohia Mill, and South Point. The botanical survey is attached as Appendix A.

The primary objectives of the field studies were to: 1) prepare a general description of the vegetation on each site; 2) search for threatened and endangered species as well as species of

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concern; and 3) identify areas of potential environmental problems or concerns and propose appropriate mitigation plans.

Existing Conditions

The vegetation around the existing towers and shelters and on the proposed new tower locations consists primarily of introduced or alien species, most of them weedy. Introduced species are all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, i.e., Cook's arrival in the islands in 1778. Kikuyu grass is the most abundant plant on pasture lands. Five of the sites: Iolehaehae, Naalehu Pasture, South Point, Ohia Mill, and Moanuaieha, are used for grazing cattle and horses. The Kauna Point (Kaiakekua) site is located on a largely barren aa lava flow. The Kulani Cone site is located in an area with koa/ohia montane wet forest, but the summit of the cone has been leveled and graded in the past and, as a result, the vegetation is composed primarily of introduced grasses and weedy herbaceous species.

The area around each of the existing towers and proposed new tower sites has been disturbed in the past. In addition, telecommunication facilities for other government agencies and various companies are also found close by, resulting in a cluster of areas which have been disturbed, some of them bulldozed.

A few native plants are found on each of the sites or nearby. Most of them are indigenous (native to the Hawaiian Islands and elsewhere), while others such as the ohia (Metrosideros polymorpha), mamane (Sophora chrysophylla), and oalii fern (Asplenium trichomanes subspecies densum) are endemic (native only to the Hawaiian Islands). None of the plants found on the seven sites surveyed is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1999a, 1999b; Wagner et al. 1999 in Char 2003). All of them can be found in similar types of environments on Hawaii.

The urban sites within civic center complexes, police stations, etc. are generally devoid of any vegetation except for surrounding lawns of mowed grasses.

Relevant information to each site is described more fully in Section 4.2.

Potential Impacts and Mitigation Measures

The proposed Project is not expected to have a significant negative impact on the botanical resources. The only site of some concern is the Kulani Cone site as it is situated within an excellent example of koa/ohia montane wet forest. Mitigation measures for Kulani Cone are described in Section 4.2.12.

4.1.4 Wildlife Resources

Eight of the 19 sites were determined to require wildlife assessments. These typically occurred in rural settings within Conservation or Agriculture Zones. The seven sites are: Huehue Ranch, Iolehaehae, Kauna Point, Kulani Cone, Moanuaieha, Naalehu Pasture, Ohia Mill, and South

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Point. The wildlife survey is attached as Appendix B. The sites were visited between March 29 and May 5, 2003.

The objectives of the assessments were to describe the avian and mammalian species components at each site and determine whether threatened, endangered or sensitive species were present, and if present, determine the impact that the project would have on those species.

Follow-up studies at four sites (Iolehaehae, Kamehameha Park, Kauna Point, and Kulani Cone) to assess native seabirds are in process. Preliminary information is attached as Appendix B-1 and B-2.

Existing Conditions

Urban sites. Eleven sites which are in developed and urbanized areas are assessed for typical wildlife which may occur in those environments. Common mammals associated with urbanized areas are feral cats, small Indian mongoose, black and Norway rats and the house mouse. None of these are native to Hawaii but have become integrated into the human environment.

The introduced common mynas, house sparrows, spotted and zebra doves, feral pigeons, house finches, northern cardinals have become part of the urbanized landscape throughout Hawaii. On the island of Hawaii, yellow billed cardinals and yellow fronted canaries may also be found in both urban and rural environments.

Rural sites. Huehue Ranch, Iolehaehae, Kauna Point, Kulani Cone, Moanuaiahea, Naalehu Pasture, Ohia Mill, and South Point.

Domestic cattle were present at four of the eight sites. Typically feral pigs can be encountered in most rural settings. Pigs were seen in the rangeland below Iolehaehae and may likely be found around Kulani Cone. Feral goats were observed within Manuka Natural Area Reserve, not far from the Kauna Point site. Old goat droppings were found at Huehue Ranch. Feral sheep and mouflon were expected from Iolehaehae but none were observed during the surveys.

Rural sites have small mammals that are also associated with urbanized human environments: feral cats, small Indian mongoose, rats and the house mouse. The endangered Hawaiian hoary bat is found throughout the island of Hawaii and would be found in most environments. They are often seen flying over bodies of water in the evening searching for insects.

Many introduced gamebirds were found at the rural sites. Erkel's francolin, Kalij pheasant, turkey, spotted doves, zebra doves were common. At Iolehaehae, chukars and California valley quail were also present. With the exception of the house sparrow, many of the birds found in urban areas can also be found in rural settings. Common myna, zebra and spotted doves, northern cardinals, house finches, yellow fronted canaries, saffron finches, yellow billed cardinals and nutmeg manikins are widespread. Iolehaehae and Kulani Cone were also within indigenous forest bird habit. Apapane and amakihi were found at both sites. Hawaiian thrush or omao was present at Kulani Cone. Elepaio were not observed but are expected at both sites. The Hawaii natural history data base show records of federally listed endangered Hawaiian

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hawk, ou, akiapolaau, Hawaii creeper, and Hawaii akepa near the vicinity of Kulani Cone. Hawaiian hawks are widespread throughout the island of Hawaii could be expected at most of the sites with surrounding forests.

The Hawaiian hoary bat is widespread on the island of Hawaii, however it is unlikely that bats would be negatively impacted by the proposed project since bats use echolocation to navigate and forage on flying insects, and therefore it is highly unlikely that they would collide with one of the existing or replacement antenna structures.

Seabirds: Newell's Shearwater and Hawaiian Dark Rumped Petrel

The Newell's shearwater is a federally listed threatened species and the Hawaiian dark-rumped petrel is a federally listed endangered species.

Newell's shearwater (*Puffinus newelli*), nests high in the mountains in burrows excavated under thick vegetation, especially uluhe (*Dicranopteris linearis*). Newell's have been reported in the Kohala Mountains and Waipio Valley in relatively large numbers (David 2002 in Ohashi 2003). Egg laying probably takes place at the beginning of June. Most hatching occurs between mid-July and the first week in August. Most adults leave nesting colonies by the beginning of October. The chicks fledge in October and early November. It is during this time that the Newell's shearwaters are noted for their "fall out" or "raining down" on highways, parks, football fields, and buildings. The birds are attracted to lights and become disoriented (Berger 1972).

Dark-rumped petrels (*Pterodroma phaeopygia*) have been reported to return to their breeding grounds on Haleakala as early as March. They occupied burrows but left and did not return for one to two months. The egg laying period for the entire colony was thought to be a short period in mid-May. Incubation is between 50-55 days. All young left burrows from mid-October to the first week of November (Berger 1972).

Because dark-rumped petrels on Kauai exhibited less of a problem with fallout than did Newell's shearwaters Cooper and Day (1992 in Ohashi 2003) speculated that dark-rumped petrels flew higher and were less attracted to lights than the Newell's shearwaters.

Cooper and Day (1992) studied the fallout phenomenon in October 1992 on Kauai using ornithological radar. Unfortunately the species cannot be differentiated by the radar. Species identity is presumed based on whether the targets fly in early (dark rumped petrels) or later (Newell's shearwaters) in the evening. Cooper and Day (1992) found substantial geographic variation in movement rates of these birds on Kauai. The highest rates of movement and fall out were along river valleys and over brightly lit areas and involved mainly juvenile birds. Some areas besides valleys or brightly lit places also may have substantial movements. They suspected that while natural depressions and lights may focus bird movements, in many cases the birds fly directly to colonies, regardless of these features. They indicated that it was unclear how consistently birds fly through specific areas while going to and from colonies.

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Most of the targets recorded on vertical radar by Cooper and Day (1992) occurred between 249 ft (76 m) and 902 ft (275 m) above ground level. Of the 378 targets recorded by vertical radar only one occurred below 249 ft (76 m) – and that was at 226 ft (69 m). The visual estimates of altitudes of 222 shearwater or petrel targets, using night vision scopes and binoculars ranged from 98 ft (30 m) to 984 ft (300 m) (Cooper and Day 1992). These data show a tendency for the birds to transit at altitudes well above the heights of the antennas proposed in this project, with the exception of Kulani Cone which will be 250 ft (76 m).

Potential Impacts and Mitigation Measures

The project involves either refurbishing or replacing existing towers (with some sites containing several other existing towers). Many of the sites fall within the normal range of Hawaiian hawks. The hawks will not be impacted by the project since they fly during the day and have keen eyesight and will be able to see the antenna structures. The Pueo (Hawaiian owl) will also be able to see the antenna whether flying in the day or night. Forest birds, because they are not active at night, will not be impacted by the project since they will be able to see the structures and because no forest habitat alterations are planned.

The U.S. Fish and Wildlife Service (USFWS) has expressed concern over the potential take of Newell's shearwaters and Hawaiian dark-rumped petrel by the existing and replacement towers at three sites: Kamehameha Park, Kauna Point, and Kulani Cone. These sites are described in Sections 4.2.9, 4.2.11, and 4.2.12, respectively.

The County of Hawaii has been consulting with the USFWS on the seabird issue and has agreed to conduct radar ornithological surveys at three of the USFWS's recommended sites. These are at Kamehameha Park, Kulani Cone, and Kauna Point. In addition, as recommended by the USFWS the County has conducted an auditory survey at Iolehaehae on the east slope of Mauna Kea to assess if seabirds may be present at that locale. These field surveys were conducted during the month of July 2003, when peak numbers of birds may be expected in the vicinities of the towers. Radar and auditory preliminary results are described in site specific discussion sections for Iolehaehae, Kamehameha Park, Kauna Point and Kulani Cone and are attached as Appendix B-1 and B-2.

Since both Newell's shearwaters and the dark-rumped petrels fly at night, it is reasonable to assume that they would be able to see the structures and avoid them. The birds apparently have fairly good night vision, and they keep a safe distance from structures unless disoriented by bright lights (USCG 2000). Studies conducted on Kauai by Cooper and Day 1992, indicate that "fallout" occurs when birds are disoriented by bright lights. The Kulani Cone facility will be lit as required by the Federal Aviation Agency (FAA), however, the type of light has not yet been specified. In addition, data from Kauai (Cooper and Day 1992) seems to indicate that transiting birds fly at altitudes well above the proposed antenna heights with the exception of Kulani Cone, which will be 70 ft higher than the existing highest tower.

The "USFWS Interim Guidelines for Recommendations on Communications Tower Siting Construction, Operation, and Decommissioning (attached as Appendix B-3) encourages co-location at existing "antenna farms" (clusters of towers) and the use of un-guyed self-supporting

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or monopole towers to minimize effects on seabirds and other birds as well as removing obsolete or unused towers.

The County of Hawaii proposal, as described in this environmental assessment, conforms to the USFWS guidelines. Co-location by all County of Hawaii uses, as well as other State and Federal users, have been encouraged. In addition, all obsolete towers will be dismantled and removed after the new system is tested and approved.

4.1.5 Agricultural Lands

Existing Conditions

In 1975, the US Department of Agriculture Soil Conservation Service (now Natural Resources Conservation Service) initiated a nationwide inventory of important farmlands. When completed, the inventory included three categories "prime", "unique", and "other farmlands of state-wide and local importance". This classification was later adopted by the State of Hawaii Department of Agriculture under the title "Agricultural Lands of Importance to the State of Hawaii" (ALISH).

The ALISH system defines "prime agricultural land" as the best suited for food, forage, and timber crops. "Unique agricultural land" is defined as land other than prime, used for the production of high-value food crops. "Other agricultural land" is defined as land used for the production of food, feed, fiber and forage crops, but not classified as "prime" or "unique".

Five of the County's sites in the Agricultural District are within actively ranched areas: Huehue Ranch, Iolehaehae, Naalehu Pasture, Ohia Mill, and South Point. These sites are not classified in the ALISH system. Moanuaheha is classified as "other important agricultural lands" indicating that the lands are not the highest classification for productivity and high yield.

Potential Impacts and Mitigation Measures

Each of the Agricultural district radio facilities will occupy approximately 1,500 - 1,600 sq ft of land area that is currently surrounded by cattle ranch lands. Since all of these sites currently support radio facilities and the new facilities will be directly adjacent, removal of any agricultural lands from cattle grazing would not adversely affect the total land available for cattle grazing on the island of Hawaii. Cattle grazing can continue to remain an important agricultural activity on these ranch lands and on other nearby lands.

4.1.6 Archaeological and Cultural Resources

An archaeological and cultural impact assessment was conducted to identify historic properties (prehistoric sites, buildings, structures, objects, or districts) listed in, or eligible for listing in, the regulations implementing Section 106 of the National Historic Preservation Act of 1966, as amended and Act 50 relating to Hawaii's culture, and traditional and customary rights. The properties which were assessed are: Huehue Ranch, Iolehaehae, Kailua Police Station, Kauna

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Point, Kulani Cone, Moanuahea, Naalehu Pasture, Ohia Mill, and South Point. The assessment report is attached as Appendix C.

Existing Conditions

The County of Hawaii has existing tower facilities and equipment shelters at the study locations. The County will upgrade its emergency radio telecommunications facilities throughout the island. Existing towers will remain in place until new towers are up and in operation, then old towers will be removed. The new towers will be in close proximity to the existing facility. The Area of Potential Effects is considered the area where the new tower will be built. The visual area of potential effect is considered the area within which the facility is visible from any historic property.

A records search was conducted at the State Historic Preservation Division, located in Kapolei, Oahu. The search included a review of all recorded historic and prehistoric archaeological sites within a one-half mile radius in the TMK of the project areas, as well as a review of known cultural resource surveys and excavation reports. Review was also conducted of the National Register of Historic Places, Hawaii Register of Historic Places, and Inventory of Historic Places. The Historic Properties Directory was inspected for the addresses of each TMK. In addition, an archaeological site inspection was conducted for Iolehaehae, Naalehu Pasture, South Point, Kauna Point, Ohia Mill, Kailua Police Station, Moanuahea, and Kulani Cone between April 18 - 24, 2003.

Potential Impacts and Mitigative Measures

The results of the records search indicate that there are no archaeological sites recorded within one-half mile in the TMK of seven of the eight facilities. There are no properties listed on the National Register of Historic places and one property, Kauna Point, was listed on the Hawaii Register of Historic Places within one-half mile of TMK: 9-1-001:003 in Manuka. No reports were identified pertaining to the archaeological sites at any of the eight project areas.

The records search did not list any historic resources adjacent to seven of the tower facilities. In all cases, because the area around the existing facilities has been cleared, machine graded, and otherwise disturbed during the original tower construction, there is no potential impact to any unrecorded archaeological sites. In accordance with 36 CFR Part 800, the effects of the new County facilities on any historic properties were assessed and the results indicate that no historic properties would be affected by the presence of new facilities at Iolehaehae, South Point, Ohia Mill, Kailua Police Station, Moanuahea, and Kulani Cone.

In addition, a determination of "no adverse effect" on historic properties at Naalehu Pasture is provided if certain conditions are imposed and followed as mitigative actions (see Section 4.2.150.5). A "no adverse effect" also applies to the Kauna Point tower site which is within ½ mile of an historic site, but is to undergo refurbishment only (see Section 4.2.12.5).

To assess the impacts to Hawaii's culture and traditional and customary rights, review was made of the studies for the botanical and wildlife resources and the archaeological resources (which

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have been conducted at sites which are rural in nature) together with the information gathered at public scoping and informational meetings (see Section 8). Relevant points include the following topics:

- *Gathering and other cultural uses:* The use of any of the radio facility properties for subsistence or traditional agricultural gathering or other cultural uses have not been previously identified.
- *Hunting:* Iolehaehae and Kauna Point are within or directly adjacent to hunting areas; however, the existing radio facilities nor the replacement or refurbished facilities would cause any impact to traditional hunting practices at these locations.
- *Religious or spiritual customs:* There has not been any identified use of any of the properties for religious or spiritual uses.

The islandwide sites have been in use as telecommunications sites generally for the past approximately 30 years and occupy only a small portion of larger tracts of land. This project would not have a significant negative effect on Hawaii's culture or individual's traditional and customary rights.

4.1.7 Visual Considerations

Existing Conditions

The existing County emergency radio system has been in place for approximately 30 years at 19 locations around the island. Ten of the locations are in urban towns or along highways. The remaining nine are in rural locations. Site specific discussions are included in Section 4.2.

Potential Impacts and Mitigative Measures

Microwave transmission requires line-of-sight communication paths between antennas throughout the linked sites. Moreover, the size of Hawaii island and the diverse topography requires the placement of the facilities at vantage points for optimal transmission. These paths were studied (Harris 2003) and antenna heights determined. To mitigate visual impacts, the towers which are proposed do not exceed the requisite heights for the antennas. Thus, the design of the project mitigates negative visual impacts by maintaining the path survey's recommended antenna heights. Further site specific discussions are included in Section 4.2.

4.1.8 Traffic and Roadways

Existing Conditions

Mamalahoa Highway circles the island and provides the initial access to all of the sites. Site specific access descriptions are provided in greater detail in Section 4.2.

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Urban Sites. All of the radio facilities currently exist at the sites which are described as urban; they are located at existing public facilities: Police (5) or fire (1) stations, a baseyard (1), and recreational park complex (1). All facilities are accessed from major roadways within the towns and communities in which they are located.

Rural Sites. The Agricultural (7 sites) and Conservation (4 sites) sites are on privately owned property (8 sites) and public property (5 sites). The Kau and Kailua Police Stations are accessed directly from major roadways. Kauna Point facility is accessed through the Manuka State Park/ Natural Area Reserve makai roadways. The Kulani Cone facility is accessed through the Kulani Correctional Facility; Naalehu Pasture and South Point from ranch dirt roads and South Point Road, and the remaining sites of Huehue Ranch, Iolehaehae, Ohia Mill, and Moanuaiea through private rural roadways.

Potential Impacts and Mitigation Measures

The construction period at each site is expected to be from 4 to 6 weeks and radio equipment installation an additional 4 weeks. Traffic on public roadways will be increased during this period when construction equipment, building materials, and telecommunication equipment are transported to the various sites. The movement of heavy equipment and delivery of building materials will be timed during off-peak traffic periods to minimize roadway impacts.

Construction related traffic will also occur approximately one year following the complete installation of the looped system when the old towers will be removed and transported to an off-site County location. Again the movement of heavy equipment and hauling of building materials would be during non-peak traffic periods.

Construction traffic impacts will be short-term, and generally, no adverse effects to traffic are anticipated; however, as warranted by specific site conditions, traffic control officers will be assigned to direct traffic during heavy equipment movement on the major roadways. See site specific discussions in Section 4.2 below.

Over the long-term operation of the system, the facilities do not require onsite personnel. Contract personnel will maintain the sites on a regular basis – traveling to each location approximately once each quarter. Thus, no permanent daily traffic to the sites will be generated.

4.1.9 Noise

Existing Conditions

The ambient noise levels at the 19 locations vary according to the surrounding environment. Noise sources in the urban environment are generally associated with traffic on the adjacent streets and daily activities of the surrounding uses. The rural locations are generally in remote agricultural and conservation areas where noises are limited to wind, occasional overhead aircraft, livestock, and agricultural or recreational traffic.

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The existing radio facilities do not generate noises except at times when the emergency standby generators are tested every quarter to assure they will function when power outages warrant their use.

Potential Impacts and Mitigation Measures

Noise levels will increase during the short-term construction period. Noise sources will include the increased traffic to transport heavy construction equipment, foundation construction and building of the tower structures. The radio equipment shelters will be pre-constructed and transported to the sites, thus noises are limited to their installation.

The noises associated with construction will be limited to daytime hours on week days and will not create impacts that require mitigation.

The emergency standby generator will be housed in compartments in the radio shelter or in separate buildings which will be designed to suppress noise during testing and operation. Since routine testing will be limited to short durations of a few minutes only periodically, this inconvenience to surrounding uses will be minimized. In the remote rural areas there are no nearby residences that would be affected. At the urban locations, the sites are generally surrounded by commercial uses and residences; however, the shelter design will suppress any prolonged generator noises.

In the event of a power outage, the generator is automatically activated for uninterrupted radio service and then automatically shut off when electricity is restored. Any inconvenience due to noise within populated areas must be weighed against the importance of maintaining the microwave interconnect for emergency communications.

The project activities shall comply with the Administrative Rules of the Department of Health: Chapter 11-46 Community Noise Control.

4.1.10 Air Quality

Existing Conditions

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. Thus, ambient air quality at the 19 locations vary according to the topography, elevation, winds, temperature conditions, and surrounding land uses of the area.

Except for periodic impacts from volcanic emissions (vog) and possibly localized impacts from traffic congestion the present air quality around most of the sites is believed to be relatively good.

The existing radio facilities do not generate contaminants that impact air quality. Periodically, the emergency standby generators are tested to assure they will function when power outages warrant their use. Generally, generators are stored in sealed compartments which limit the emissions to the air.

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Potential Impacts and Mitigation Measures

Short-term direct and indirect impacts on air quality could potentially occur due to project construction. Two potential types of air pollution emissions during project construction include (1) fugitive dust from vehicle movement and soil excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there could be short-term impacts related to slow-moving equipment traveling to and from the project site, however this is limited in duration at each site for an approximately 10 to 15 days when trucks will be transporting the equipment, building materials, and components to each of the sites.

On-site mobile and stationary construction equipment will emit air pollutants from engine exhausts.

In each case where a new tower structure will be constructed, the grading area is limited to the structure's footprint and fenced area ranging from 900 to 1,500 square feet. Soils will be exposed for approximately 5 days prior to the pouring of concrete to establish the footings for the various structures. The ground within the fenced area of most of the sites will be dressed with a layer of base course to minimize maintenance and to control dust.

Mitigation Measures for Short-Term Impacts:

- In dust-prone or dust-sensitive areas, implement control measures such as frequent watering to keep-bare dirt surface from becoming significant sources of dust.
- Cover open-bodied trucks at all times when they are in motion if they are transporting materials that could be blown away.
- Comply with all provisions of Hawaii Administrative Rules, Chapter 11-60.1, Air Pollution Control and Section 11-60.33, Fugitive Dust.

4.1.11 Health Issues - Electromagnetic Radiation Environment

The Federal Communications Commission (FCC) website at <http://www.fcc.gov/oet/rfsafety/> contains detailed and informative discussions and explanations on the health issues of electromagnetic radiation (EMR). The following description is adapted from the FCC website.

Electromagnetic radiation (EMR) consists of waves of electric and magnetic energy moving together (i.e., radiating) through space at the speed of light. Taken together, all forms of electromagnetic energy are referred to as the electromagnetic "spectrum." Radio waves and microwaves emitted by transmitting antennas are one form of electromagnetic energy. They are collectively referred to as "radiofrequency" or "RF" energy or radiation. Often the term "electromagnetic field" or "radiofrequency field" may be used to indicate the presence of electromagnetic or RF energy.

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The RF waves emanating from an antenna are generated by the movement of electrical charges in the antenna. Electromagnetic waves can be characterized by a wavelength and a frequency. The wavelength is the distance covered by one complete cycle of the electromagnetic wave, while the frequency is the number of electromagnetic waves passing a given point in one second. The frequency of an RF signal is usually expressed in terms of a unit called the "hertz" (abbreviated "Hz"). One Hz equals one cycle per second. One megahertz ("MHz") equals one million cycles per second.

Different forms of electromagnetic energy are categorized by their wavelengths and frequencies. The RF part of the electromagnetic spectrum is generally defined as that part of the spectrum where electromagnetic waves have frequencies in the range of about 3 kilohertz (3 kHz) to 300 gigahertz (300 GHz). Microwaves are a specific category of radio waves that can be defined as radiofrequency energy where frequencies range from several hundred MHz to several GHz.

A variety of commercial communications and data systems are made possible by transmitting information via electromagnetic waves. For example, most amplitude modulated (AM) radio stations transmit signals in the frequency range of 550 kHz to 1,600 kHz, while frequency modulated (FM) radio stations transmit signals in the frequency range of 88 MHz to 108 MHz.

FCC has established maximum permissible exposure (MPE) limits to electromagnetic radiation. A summary of the FCC's "local Official's Guide to RF" explains:

The FCC's guidelines establish separate MPE limits for "general population/uncontrolled exposure" and for "occupational/controlled exposure". The general population/uncontrolled limits set the maximum exposure to which most people may be subjected. People in this group include the general public not associated with the installation and maintenance of the transmitting equipment. Higher exposure limits are permitted under the "occupational/controlled exposure" category, but only for persons who are exposed as a consequence of their employment (e.g., wireless radio engineers, technicians). To qualify for the occupational/controlled exposure category, exposed persons must be made fully aware of the potential for exposure (e.g., through training), and they must be able to exercise control over their exposure. In addition, people passing through a location, who are made aware of the potential for exposure, may be exposed under the occupational/controlled criteria. The MPE limits adopted by the FCC for occupational/controlled and general population/uncontrolled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

Therefore, any area located outside of a radio facility fence is defined as a "general population/uncontrolled exposure" area. Almost all people live and work in an "uncontrolled" environment filled with radio energy from sources as diverse as broadcast stations (AM, FM, and TV), cellular telephone transmitter sites and handheld cell phones, LMR, wireless computer networks, and natural radio energy sources such as thunderstorms. However, this "uncontrolled" environment is safe because the signal energies are usually well below the MPE limits.

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The facilities in the County's radio system will be considered an "occupational/controlled exposure" environment, the expected EMR levels both on the ground inside the fenced compound and inside the equipment shelter will be below the MPE limits for a "general population/uncontrolled exposure" environment. Personnel servicing and testing equipment within the shelter should not be exposed to an EMR hazard. However, tower maintenance personnel can be exposed to potentially unsafe levels of EMR if proper access and work procedures are not followed.

Potential Impact and Mitigation Measures

EMR consists of time varying electromagnetic fields that have the characteristic of motion or propagation. Unfortunately, radio frequency EMR is often confused with ionizing radiation which has known biological hazards ascribed to X-rays, gamma rays, and particle beam energies. Even moderate levels of ionizing radiation are dangerous as they have sufficient quantum energy to expel an electron from a molecule. This expulsion leaves the molecule positively charged and thereby affecting its interactions with neighboring molecules. In biological systems this ionization can alter the molecule functions fundamentally and often irreversibly.

The energies from non-ionizing radiation, such as radio frequency EMR, are much lower such that, even very high signal intensities, their primary effect is to agitate or vibrate the molecular structure rather than to ionize them. The effect of this agitation is to produce heat. In humans, the heat produced by such exposure is undetectable above the heat produced by the normal metabolic rate. Even an intentional exposure, the thermoregulatory capabilities of mammals and birds can adequately accommodate dissipation of the added heat load.

The Kahua Ranch radio site draft environmental assessment (Wilson Okamoto Corporation 2003) states: "In a rigorous study completed for a DAGS facility with a similar mix of emitters, the distances required to keep personnel safe from EMR hazards were less than 20 feet for all emitter types and the only hazardous area associated with the microwave emitters occurred immediately in front of those antennas. The lowest microwave dish antenna will be mounted with its centerline and bottom rim above ground level." The antennas planned to be mounted on the County's towers are well above the 20-ft threshold and will not produce an EMR hazard to people or animals beyond the fence line.

4.1.12 Infrastructure and Services

Water and Wastewater

Existing Conditions

The radio facilities at 19 islandwide sites are in urban developed locations in association with police stations, and other public facilities as well as in rural remote areas. The operation of the facilities do not require permanent staff, therefore, water and wastewater services are not required.

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Potential Impacts and Mitigation Measures

Fire protection for the equipment shelters will include hand-held fire extinguishers. Wastewater will not be generated at the sites. Therefore, the project will not adversely affect water and wastewater systems.

Electrical

Existing Conditions

Hawaii Electric Light Company (HELCO) provides commercial electrical power to all of the radio sites except Iolehaehae and Kauna Point which are solar powered sites. Backup generators are automatically activated during power outages and when power is restored, the system automatically shuts off.

Potential Impacts and Mitigation Measures

The construction and operation of the project will not require substantial energy consumption.

- Two sites are solar powered.
- Seven sites will receive new 200 amps (A) service from HELCO.
- Three sites will receive new 100A connections from existing sources, or HELCO.
- Six sites will use existing power from 1-2 20A breakers from the existing distribution panels within the buildings.

Solid Waste / Hazardous Materials

Existing Conditions

The existing facilities at 13 locations will be replaced by new facilities and will require demolition and disposal. The components include tower structures, antennas, shelters, radio equipment, lines, equipment racks, generators, and fuel tanks. The target date for the demolition/removal is December 31, 2004 after the new radio system has been tested and properly operating.

Many of the facilities were constructed approximately 25 to 30 years; hence, the use of lead based paint is possible as well as materials containing asbestos.

Potential Impacts and Mitigative Measures

Prior to demolition, an assessment for hazardous materials will be conducted at each site and a disposal plan will be prepared. All equipment and materials will remain at the current locations until the assessment and plan are completed. The results of the assessment will determine whether the removed structures and equipment can be recycled or taken to a landfill.

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Recycling. Batteries and fuel tanks are planned to be recycled to an approved vendor. The steel from the towers, if found free of any hazardous paint, may be recycled by a scrap metal dealer on the island. Similarly, the fiberglass shelters, if found free of hazardous materials will be recycled. Any un-useable radio equipment, racks, antennas, lines, and generators would also be recycled to a scrap metal dealer on the island.

Disposal Process. Towers and shelters will be dismantled by cranes, cut up and hauled off to an appropriate facility for recycling and/or landfill.

Disposal Area. The final destination for the components will be determined by the assessment and disposal plan. The disposal area required will depend on how much of the materials can be recycled.

Refurbishing process. There are a total of 5 sites that have been identified for refurbishment. The process of refurbishing the towers involves strengthening by bolting/welding steel members to the existing structures to accommodate the weight of the new antennas and lines, if necessary. The shelters will be upgraded to handle the new electrical loads, new batteries, floors replaced, buildings resealed, etc, as necessary.

Health hazards and disposal of hazardous materials. All towers and shelters will be assessed for any hazardous materials before demolishing. If a hazardous material such as asbestos or lead paint is identified, appropriate measures will be taken to dismantle or contain the hazardous material. The disposal location would be at an approved landfill facility and documented appropriately to identify the hazards. If no hazardous material is identified, the material will be cut up in appropriate sections and hauled off to a licensed landfill or to scrap metal dealer on the island for recycling.

All microwave equipment would be disconnected, and thus, there would be no health hazards associated with potential radiation exposure.

Process to dispose. Upon completion of our assessment and preparation of the disposal plan, the County's contractor will contact the County Solid Waste Division prior to its implementation.

4.1.13 Non-Governmental Co-Locating Organizations

Existing Conditions

The Public Broadcasting System (PBS) and Hawaii Electric Light Company (HELCO) are two non-governmental users of the County radio infrastructure. HELCO has been a co-locator since approximately 1976 and PBS since the early 1980's. Both organizations will continue to share the use of the upgraded County facilities. At present, there are no other non-governmental or commercial users.

The County of Hawaii recognizes the value of maximizing the use of its upgraded facilities. At this time, other public agencies are planned to co-locate at several sites (as described in Section 2.8 above). In addition, the County would also consider allowing commercial user co-locaters,

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especially at remote sites, to minimize the impacts on the environment by reducing the number of tower facilities versus duplicating unnecessary facilities. Therefore, the potential is available for opportunities for collaboration with other public agencies and commercial entities in the future.

Potential Indirect and Cumulative Impacts and Mitigation Measures

The shared use by commercial companies, especially at remote sites, will minimize the direct impacts on the environment by reducing the number of tower facilities versus duplicating unnecessary facilities.

Direct, indirect, and cumulative impacts for co-locating by non-governmental or commercial radio and tele-communications companies include the following:

- No additional ground disturbance for new tower construction
- Reduced impacts to botanical resources
- Reduced impacts to wildlife
- Reduced impacts to historic and cultural properties
- Reduced short-term construction traffic impacts
- Reduced short-term construction impacts to noise and air quality
- Reduced visual impact with fewer towers in the landscape
- Fewer construction jobs and revenue generation from employment
- Potential income generation opportunities for the County
- Savings to commercial communications providers

Further, co-location is also encouraged by the USFWS in their Interim Guidelines for telecommunications facilities (attached as Appendix B-3) as a means to reduce impacts of bird collisions with tower structures. The planned County of Hawaii upgrades are all designed as un-guyed self-supporting (lattice type) or monopole structures. Thus, the opportunities for co-location would be on un-guyed towers at locations which already contain existing towers, thus minimizing and mitigating for opening of new locations for new towers.

4.1.14 Environmental Justice

Existing Conditions

Federal Executive Order 12898 Environmental Justice (1994) requires Federal actions to address environmental justice in minority and low-income populations. The County of Hawaii is encouraging other public safety agencies (including federal agencies) to co-locate their radio facilities on the County system. Several federal agencies with public safety functions including the FBI, NOAA National Weather Service, PACMERS, and USGS HVO will be co-located at a number of facilities with the County and State agencies. For further agency descriptions, refer to Section 2.8.

Executive Order 12898 sets forth a process for each Federal agency to achieve the environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high

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and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

Potential Impacts and Mitigative Measures

This action would be in compliance with Executive Order 12898 and ensures environmental justice for all members of the community including minority and low-income populations. The upgrades to the County's emergency radio system will benefit the community as a whole and it is not anticipated that the proposed action would result in any adverse or disproportionate human health or environmental impacts on minority and low-income populations. Conversely, the welfare of all individuals (including minority and low-income individuals) would be enhanced by the planned improvements.

4.2 SITE SPECIFIC DISCUSSIONS

The preceding Section 4.1 describes the Project's overall conditions and the potential impacts that are applicable to the Project as a whole. This section describes each facility's site specific potential impact on the immediate environment.

4.2.1 Captain Cook Police Station

The existing Captain Cook Police Station radio antenna tower (40-ft) will be replaced with a new 50-ft self supporting tower. The microwave radio equipment is installed within the police building. This spur site provides a path to/from Ohia Mill to the south. The Hawaii Volcanoes Observatory will co-locate at this facility.

4.2.1.1 Location, Access, Surrounding Use

The Captain Cook Police Station is within a civic center complex located in the town of Captain Cook, ahupuaa of Kealahou, and district of South Kona. The civic center also includes the Captain Cook Fire Station.

The site of the existing and proposed radio facilities is at the rear (southeast corner) of the Police Station building. The physical address is 82-6130 Mamalahoa Highway with access from Mamalahoa Highway. The site is abutted to the north by the existing police building, to the east by a gravel walkway/landscape area, to the south by paved parking and a large aboveground fuel storage tank and to the west by an existing generator building. Other development in the vicinity includes State of Hawaii offices to the northwest, parking lots to the east, County Fire Station to the southwest, and paved parking to the south and west.

Kealahou Bay is approximately one mile to the west and Kailua-Kona is approximately 12 miles to the north.

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4.2.1.2 Physical Environment

The climate of the project area is mild and characteristic of leeward areas. The site has been graded in the past and is relatively flat at an elevation of approximately 1,490 feet. South Kona is located on the westerly flank of Mauna Loa.

The vicinity of the Captain Cook site has been mapped by the U.S. Geological Survey and Stearns and McDonald as being underlain by the Kau volcanic series, Kahuku volcanic series.

Potential Impacts and Mitigative Measures.

The action of upgrading the Captain Cook Police Station radio facilities will have no negative effects on the physical environment, including the climate of the area. Moreover, to accommodate the existing development, the site was extensively graded in the past as evidenced by vertical to near vertical, 15 to 20-foot high cuts along the easterly and southeasterly portions of the property (between the site and the parking lots). It is estimated that in the specific area of the proposed communications compound, cuts on the order of 10-feet were accomplished to lower the site to existing elevations. Basalt lavas are exposed in the cut slopes.

4.2.1.3 Botanical / Wildlife Resources

The site is a developed facility with paved surfaces and sparse landscape plantings. Wildlife in the area would consist of stray cats and dogs and exotic birds common to urban areas. Thus, no adverse impacts are anticipated to flora and fauna.

4.2.1.4 Archaeological / Cultural Resources

The site has been previously graded to a depth of 15-20 feet and is in use for civic center uses; thus, there are no archaeological or cultural resources at the site.

4.2.1.5 Traffic

In the South Kona region, the two-lane Mamalahoa Highway experiences periodic traffic congestion due to stalled vehicles, accidents or other events. The construction of a By-Pass Highway is in progress as a long-term solution to alleviate this problem.

Potential Impacts and Mitigative Measures

During the short-term construction period, the movement of heavy equipment, building materials, and telecommunication equipment will be transported to the site over the construction period of 4 to 6 weeks. As warranted, traffic control officers will be assigned to direct traffic during heavy equipment movement at the Mamalahoa intersection.

No long-term traffic impacts are anticipated.

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4.2.1.6 Visual Considerations

The town of Captain Cook is characterized by family run coffee farms, residential subdivisions, and small business enterprises. The Police Station is situated along Mamalahoa Highway at the town core and is surrounded by office buildings. The emergency radio facilities (which include the existing 40-ft self supporting tower) have been in place at this location for many years.

Potential Impacts and Mitigative Measures

The new 50-ft self supporting (lattice type) replacement tower will be placed next to the existing police station building and will increase in height by 10 feet. This increase is not anticipated to be a significant impact within an already built environment.

4.2.2 Fire Central

On the roof top of the approximately 45-ft high Central Fire Station is an existing 30-ft guyed tower. This antenna currently supports several whip antennas. A parabolic antenna which provides a path to the Public Safety Building is mounted on a pole on the side of the station building. A new 90-ft self supporting tower and new shelter will replace the existing facilities.

4.2.2.1 Location, Access, Surrounding Use

The Central Fire Station is located at the intersection of Kinoole and Ponahawai Street, in Hilo town, district of South Hilo. The physical address is 466 Kinoole Street; access is from Kinoole Street.

The existing radio facilities are on and within the Fire Station building. The site proposed for the replacement system is at an elevation of about 27-feet and is located in the southeast corner of the Central Fire Station property within the parking area adjacent to the Dispatch Center and auxiliary services building.

Central Fire Station is bordered by Kinoole Street and commercial buildings to the east, Lincoln Park and residential apartment buildings to the north, a cemetery to the west, and commercial buildings to the south. The Alenaio drainage channel flows seaward along the north boundary. Hilo Bay is approximately 2,000 feet to the east-northeast and the Hilo International Airport is approximately 1.5 miles to the east.

4.2.2.2 Physical Environment

The climate of the project area is characteristic of the windward coast of the island. The site is relatively flat at an elevation of approximately 27 feet. Hilo is located on the eastern flank of Mauna Loa.

The southeasterly portion of the Central Fire Station property appears to have been filled during development of the property and is about 15 to 20-feet higher in elevation than the invert of the Alenaio Stream drainage channel located immediately south and east of the property. The area

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planned for the communication system is presently covered with an approximately 6-inch thick concrete grade slab supported on about 13-feet of fill. The grade slab is elevated above surrounding ground to the southwest and southeast with the near surface fill (fill directly below the grade slab) contained by a rock retaining wall ranging from about 2 to 5-feet in height. The rock retaining wall appears to be founded on fill and is failing along the southeasterly portion of the concrete grade slab (area nearest the drainage channel and deepest fill) as evidenced by rotation of the wall (leaning) away from the concrete grade slab.

The vicinity of the Central Fire Station site has been mapped by the U.S. Geological Survey and Stearns and McDonald as being underlain by the Kau volcanic sites. The Kau volcanics consist of vent deposits, littoral deposits and tephra-fall deposits of tholeiitic and rarely transitional basalts. Lava flows consist both of both pahoehoe and aa. The Kau volcanic series are fairly fresh, commonly bare in rocky and dry areas and are rarely over 25-feet thick except near the summit of Mauna Loa where they exceed 800-feet in thickness.

The adjacent Alenaio Stream is modified as a concrete channel and is designated as a Zone AE Floodway. The site however, is approximately 20 feet higher and is designated in Zone X. The site may also be situated in a tsunami inundation area.

Potential Impacts and Mitigative Measures.

The upgrading of the Central Fire Station radio facilities will have no negative effect on the physical environment including the climate of the area. As described above, the site has been previously altered in the initial development of the facility; thus no negative effects are anticipated by the construction of the replacement radio facilities.

Design of the facilities will comply with County requirements for the tsunami inundation zone.

Measures will be taken to minimize and construction related runoff into the Alenaio Stream.

4.2.2.3 Botanical / Wildlife Resources

The site is a developed facility with paved surfaces. Wildlife in the area would consist of stray cats and dogs and exotic birds common to urban areas. The existing guyed tower structure has been in place for many years and will be replaced by a self supporting tower. This is expected to be less of a hindrance to birds which may transit the area.

4.2.2.4 Archaeological / Cultural Resources

The site has been previously graded and in urban uses; thus, there are no archaeological resources at the site.

4.2.2.5 Traffic

The roadways in Downtown Hilo are heavily traveled; however, traffic movement is free flowing. The intersection of Ponahawai and Kinoole is signalized.

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Potential Impacts and Mitigative Measures

During the short-term construction period, the movement of heavy equipment, building materials, and telecommunication equipment will be transported to the site over the construction period of 4 to 6 weeks. Heavy equipment transport to the site will be scheduled during off-peak periods and as warranted, traffic control officers will be assigned to direct traffic during heavy equipment movement at the intersection of Ponahawai and Kinoole Streets. No long-term traffic impacts are anticipated.

4.2.2.6 Visual Considerations

This area of Downtown Hilo is characterized by commercial office buildings, apartment buildings, and small business enterprises. Central Fire Station is situated in Downtown but apart from the historic section along the main bayfront roadway. The tower structure will be surrounded by tall buildings that line Kinoole Street at this location. The emergency radio facilities (which include the existing rooftop 30-ft guyed tower) have been in place at this location for many years.

Potential Impacts and Mitigative Measures

The new 90 ft replacement tower will be placed next to the Dispatch Center and auxiliary services building and will increase the tower height by approximately 20 feet (over the rooftop antenna). As a self supporting tower the width of the tower will increase; however, there would not be any supporting guy wires. The growth of trees in the surrounding area requires the additional height in the tower, however, this is not anticipated to be a significant visual impact within an already built environment.

4.2.3 Hamakua Police Station

The Hamakua Police Station facility will consist of a new 100-ft monopole tower and new equipment shelter to replace the existing 80-ft monopole. This facility provides paths south to Iolehaehae and northwest to Kamehameha Park.

4.2.3.1 Location, Access, and Surrounding Uses

The Hamakua Police Station is within the Hamakua Civic Center complex located in the town of Honokaa in the district of Hamakua. The civic center also includes other County and State buildings which house the following agencies: County Fire Station, Hamakua District Highway Division, Honokaa Public Library, District Court, and other state offices. The physical address is 45-3380 Mamane Street in Honokaa; access is from Mamane Street which is approximately one half mile from Mamalahoa Highway.

The site of the existing and proposed radio facilities is at the rear (north) of the Police Station building.

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Across the civic center complex to the south is the combined Honokaa Elementary, Middle and High School campus. To the north are residential homes. The Pacific Ocean is approximately 1.5 miles to the north and Waipio Valley is approximately 10 miles to the northwest.

4.2.3.2 Physical Environment

The climate of the project area is characteristic of windward coastal locations. The civic center site slopes to the east and the elevation of the radio facilities site is approximately 1,097 feet. This site is located on the northeasterly flank of Mauna Kea.

The vicinity of the Hamakua Police Station site is underlain by the Hamakua volcanic series. The Hamakua volcanics are chiefly tholeiitic basalts with piorite-basalts, carrying olivine and augite phenocrysts and a few alkalic basalts, hawaiites, and ankaranites in its upper part. The Hamakua volcanics are typically covered with 4 to 15-feet of tan-colored vitric ash (Pahala Ash). Lava flows consist of both pahoehoe and aa. Flows are dark gray where fresh, but surfaces are largely weathered to yellowish brown, or brown, show little if any relict flow-surface texture, and are discontinuously mantled by unmapped eolian, tephra-fall and colluvial deposits.

Potential Impacts and Mitigative Measures

The upgrading of the Hamakua Police Station radio facilities will have no negative effects on the physical environment including the climate of the area since similar facilities have been in place at this location for the past 25 to 30 years. Moreover, to accommodate the existing development, the site was extensively graded in the past to construct the civic center complex.

4.2.3.3 Botanical / Wildlife Resources

The site is a developed facility with paved surfaces and sparse landscape plantings. Wildlife in the area would consist of stray cats and dogs and exotic birds common to urban areas. Seabirds are known to inhabit the Waipio Valley environs approximately 10 miles to the north where streams flow along the valley floor.

Potential Impacts and Mitigative Measures

Discussions with the USFWS indicate that while seabirds may transit within the Hamakua region, it is unlikely that the new monopole tower will have a significant effect on seabirds. Thus, no adverse impacts are anticipated.

4.2.3.4 Archaeological / Cultural Resources

The site has been previously graded for construction of the civic center; thus, there are no archaeological or cultural resources at the site.

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4.2.3.5 Traffic

Mamalaho Highway and Mamane Street provide access to the Hamakua Civic Center and Police Station site. Access to the Honokaa school campus is from Pakalana Street approximately 100 yards to the west. Traffic tends to be heavier during the morning peak period but eases shortly after the 8AM hour.

Potential Impacts and Mitigative Measures

During the short-term construction period, the movement of heavy equipment, building materials, and telecommunication equipment will be transported to the site over the construction period of 4 to 6 weeks. Heavy equipment transport will be scheduled during off-peak hours; however, as warranted, traffic control officers will be assigned to direct traffic at the Mamane Street access.

No long-term traffic impacts are anticipated.

4.2.3.6 Visual Considerations

The town of Honokaa is part of the Hilo to Hamakua Heritage Corridor and is characterized as a gateway to the historic Waipio Valley. Mamane Street is the main street with a distinct "Hawaiian cowboy" atmosphere.

The Police Station is set back from Mamane Street approximately 100 feet and is approximately 40 feet below the level of the street. The emergency radio facilities behind the Police Station building (which include the 80-ft monopole) have been in place at this location for many years.

Potential Impacts and Mitigative Measures

The replacement 100-ft monopole tower will be placed in a grassed area downslope of the Police Station parking lot and will increase in height by 20 feet. This increase is not anticipated to be a significant impact within an already built environment.

4.2.4 Hilo Baseyard

The Hilo County Baseyard facility will consist of a refurbished 100-ft, self-supporting tower (or if further testing warrants, a replacement tower). This facility provides paths northwest to the Public Safety Building (headquarters of the Police Department) and further northwest to the remote Iolehaehae site. The DLNR, FBI, NOAA, and HELCO will co-locate with the County at this site.

4.2.4.1 Location, Access, and Surrounding Uses

The Hilo County Baseyard is located on Lanikaula Street in Hilo within the Kanoiehua Industrial Park. Access to the property is from Kanoiehua Avenue (Hwy 11) and onto Lanikaula Street.

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The radio facility is surrounded by other industrial uses in the adjacent areas. The Hilo International Airport terminal building is approximately 1.5 miles to the northeast. The Public Safety Building is 1.5 miles to the northwest.

4.2.4.2 Physical Environment

The climate of the project area is characteristic of windward Hawaii locations. The site is flat at an elevation of approximately 36 feet. Hilo is located on the eastern slope of Mauna Loa.

The site has long been altered and developed for industrial uses and is fully paved or covered with gravel.

Potential Impacts and Mitigative Measures

The refurbishing of the existing facilities will have no effect on the physical environment since these facilities have been in place for a number of years. Grading and paving of the baseyard occurred to construct the baseyard; thus, there are no archaeological or cultural resources at the site.

4.2.5 Huehue Ranch

The Huehue Ranch facility is primarily a HELCO site, with the County sharing its facilities. At this time the existing 100-ft self-supporting tower is planned to be refurbished and radio equipment shelter will not be altered. This facility provides paths northeast to the Waimea Police Station and Kahua Ranch.

4.2.5.1 Location, Access, and Surrounding Uses

The site is located in the ahupuaa of Kaupulehu, district of North Kona, approximately 2 miles southwest or mauka of Mamalahoa Highway. Access to the property is from Mamalahoa Highway through the privately owned Huehue Ranch property through a dirt road.

This radio facility consists of multiple antennas owned by HELCO and other commercial companies. The site is surrounded by cattle ranchland.

4.2.5.2 Physical Environment

The site is at 3,304-ft AMSL and on the northeastern slope of Hualalai on Kaupulehu Lava Flow. The mean annual temperature is 70°F. Annual rainfall in this area is 20-40 inches.

Potential Impacts and Mitigative Measures.

The refurbishing of the existing facilities will have no effect on the physical environment since no ground alterations are anticipated, nor will there be any increase in the height of the tower.

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4.2.5.3 Botanical / Wildlife Resources

The ground consists of rocky pahoehoe lava with open savanna of scattered large ohia trees and fountain grass. Other plants included mamane, Christmas berry and silk oak.

House finches, Erkel's francolin, gray francolin (*Francolinus pondicerianus*), peafowl, saffron finches, northern mockingbird (*Mimus polyglottos*), common mynas and zebra doves are common birds present at this location. A survey for native birds was made but none were encountered. The site is within the known range of the Hawaiian hawk and the pueo (Scott et al. 1986). Day et al. (2003) reported 0 targets at the nearest sampling points of Honokohau and Kona during their Newell's shearwater and Hawaiian dark-rumped petrel coastal surveys.

The site is within the known range of the Hawaiian hoary bat (Jacobs 1994). Feral goats and pigs, and rats and mice are expected to be present.

Potential Impacts and Mitigation Measures

The location of the project is not expected to be a range for any threatened or endangered forest or seabirds, thus, no adverse impacts are anticipated in the refurbishing of this facility.

4.2.5.4 Archaeological / Cultural Resources

The site has been previously graded for the numerous radio facilities that are in place; thus, there are no archaeological or cultural resources at the site.

4.2.5.5 Visual Considerations

The project site is screened by the natural topography and is approximately 2 miles from Mamalahoa Highway. It is not visible from any public roadways in the vicinity. Moreover, the existing tower facility will be refurbished and will not increase in height. Thus no adverse visual effect is anticipated.

4.2.6 Iolehaehae

The replacement facilities at Iolehaehae will be directly adjacent to the existing 40-ft guyed tower. The improvements include a new 50-ft self-supporting tower and equipment shelter and new generator. A photovoltaic solar collector system will continue as the primary energy source. This facility provides paths north to Hamakua Police Station and southeast to Hilo Baseyard. The remote Iolehaehae radio site supports several telecommunications facilities. Co-locaters at this site include DLNR, DOT, and FBI.

4.2.6.1 Location, Access, and Surrounding Uses

Iolehaehae puu is a cindercone at 8,121-ft AMSL on the northeastern flank of Mauna Kea. The puu is located approximately 400 feet beyond the Mauna Kea Forest Reserve boundary. The site is in the district of Hamakua and surrounded by lands currently used as cattle pastureland.

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Access to Iolehaehae is through the privately owned Kukaiiau Ranch which is accessed from Mana Road in Waimea approximately 23 miles to the northwest or from Keanakolu Road which connects to the Saddle Road to the south. Mana Road and Keanakolu Road are continuous segments of the same road.

4.2.6.2 Physical Environment

The mean annual temperature in this area is 42°F, with less than 40 inches of annual rainfall. Winds are principally tradewinds from the northeast. The topography is steep. Soils are rocky with lava and cinder and not well weathered making poor substrata for plants. Heavy grazing in the past by cattle and sheep has caused severe denudation of both vegetation and soil. There is sparse scrubby vegetation due to the poor soil and rigorous climate. There are open grasslands and remnant stands of koa (*Acacia koa*) and mamane (*Sophora chrysophylla*). Aalii (*Dodonea* sp.) and pukeawe (*Styphelia tameiameia*) are common where trees have disappeared. Herbs are frequent but grazing limits maximum coverage.

The summit of Iolehaehae puu has been substantially developed with 3 existing communication facilities including towers, equipment shelters, fuel tanks, generators, and solar panels. The specific site planned for the new communications system is situated on the northerly rim of the cone, next to an existing 40-foot high tower. The area is relatively flat lying with moderate to steep slopes to the north and south. Surface conditions consist of volcanic ejecta and ash with a sparse growth of grass, weeds, brush and small trees.

Iolehaehae has been mapped by the U.S. Geological Survey as a scoria cone comprised of Hawaiian volcanic rocks. Scoria is defined as pyroclastic ejecta, usually of basic ejecta, usually of basic composition, characterized by marked vesicularity, dark color, heaviness and a texture that is partly glassy and partly crystalline. Fragments of scoria between 4 mm and 32 mm are essentially equivalent to volcanic cinders. Pyroclastic ejecta may contain fragments of older solidified lava called bombs (larger than 4 cm), cinders and ash, and volcanic breccia.

Potential Impacts and Mitigation Measures

The upgrading of the Iolehaehae radio facilities will have no negative effects on the physical environment including the climate of the area since similar facilities have been in place at this location for the past 25 to 30 years. Moreover, to accommodate the existing development, the site was extensively graded in the past.

4.2.6.3 Soils and Agricultural Lands

The Iolehaehae site is located on Iolehaehae puu (hill), a cinder cone. This is mapped as "rCL", cinder land, on the soil maps (Sato *et al.* 1973) and consists of bedded cinders, pumice, and ash with rock outcrops. The site is not classified on the ALISH system.

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The replacement radio facilities will occupy approximately 2,000 sq ft of land area. Since the site currently supports the existing radio facilities and the new facilities will be directly adjacent, there will be no removal of agricultural cattle grazing lands. Thus, these improvements will not adversely affect the cattle grazing on the island of Hawaii. Cattle grazing can continue to remain an important agricultural activity on these ranch lands and on other nearby lands.

4.2.6.4 Botanical Resources

The Iolehaehae site is more or less level with loose red cinders and scattered rock outcrops. Vegetation cover is roughly 30 percent and consists primarily of somewhat stunted narrow-leaved plantain (Plantago lanceolata) and brome fescue (Vulpia bromoides), 2 to 4 inches tall. Scattered here and there are small patches and individual clumps of orchard grass or cocksfoot (Dactylis glomerata), velvet grass (Holcus lanatus), sheep sorrel (Rumex acetosella), sweet vernalgrass (Anthoxanthum odoratum), and hairy cat's ear (Hypochoeris radicata). Most of the grasses have been heavily grazed by cattle.

Native plants are associated with the rocky outcrops. A few pukeawe shrubs (Styphelia tameiameia), 3 to 5 ft. tall, and stunted, heavily browsed young mamane trees (Sophora chrysophylla), 1 to 3 ft. tall, occur here. Three small native ferns, the oalii (Asplenium trichomanes subspecies densum), kalamoho lau lii (Pellaea ternifolia), and iwa iwa (Asplenium adiantum-nigrum) are quite common in this high elevation, open, dry rocky habitat.

The existing solar panels and a service building are located near the base of the cinder cone. In this more protected area there is some soil. The vegetation consists of low mats of Kikuyu grass (Pennisetum clandestinum) and narrow-leaved plantain.

Along the base of the cinder cone, outside of the project site, the vegetation consists of mamane forest, 12 to 18 ft. tall. This subalpine dry forest type is found principally on Hawaii island, with lesser representation on East Maui. On Hawaii, it occurs primarily on Mauna Kea (Gagne and Cuddihy 1990). The mamane forest around the base of the Iolehaehae cinder cone supports scattered plants of pukiawe, pilo (Coprosma montana), naenae (Dubautia ciliolata), and the three fern species. Cattle and feral animals such as sheep, pigs, and goats have negatively impacted this forest type by eating seedlings, browsing on foliage, and stripping bark from trees. These animals have also fostered the introduction and spread of alien grasses and herbs (Cuddihy and Stone 1990 in Char 2003).

The pukeawe shrub and kalamoho lau lii and iwa iwa ferns are indigenous species, that is, they are native to the Hawaiian Islands and elsewhere. The maniane, oalii fern, and pilo and naenae shrubs are endemic species, that is, they are native only to the Hawaiian Islands.

Potential Impacts and Mitigative Measures

The replacement facilities will be directly adjacent to the existing facilities. No negative effects to the vegetation at the site and the surrounding environs are anticipated.

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4.2.6.5 Wildlife

Iolehaehae puu is on the northeast slope of Mauna Kea, just east of the Mauna Kea Game Management Area boundary. Several antennas and radio facilities are at this location. The area surrounding the puu is used as pasturage for domestic cattle. A large reservoir is located to the north of the puu.

Domestic cattle (*Bos taurus*) graze in the surrounding area. Feral pigs (*Sus scrofa*), feral sheep (*Ovis aries*) or mouflon (*Ovis musimon*) are known to be in the area. Also, feral cats (*Felis catus*), black rats (*Rattus rattus*), and the house mouse (*Mus musculus*) can also be expected.

The Draft Recovery Plan for the Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) (1997) showed bat sightings recorded near the vicinity of the site. The plan shows that bat sightings are well distributed throughout the island of Hawaii.

Naturalized game bird species include California valley quail (*Callipepla californica*), Erkel's francolin (*Francolinus erckelii*), chukar (*Alectoris chukar*), and kalij pheasant (*Lopura leucomelana*), turkey (*Meleagris gallopavo*) and ring-necked pheasant (*Phasianus colchicus*). House finches (*Carpodacus mexicanus*) and Eurasian skylarks (*Alauda arvensis*) were present during the survey. The nests of House finches were found under solar panels at the site. The common barn owl (*Tyto alba*) was not observed but is expected to inhabit the area.

Native forest birds include the endemic Amakihi (*Hemignathus virens*) and Apapane (*Himatione sanguinea*). The federally listed endangered Palila (*Loxioides bailleui*), is also expected in the area. The project site is in the vicinity of Palila Transect 115 and considered within the northern slope population (Gray et al. 1999). None of these birds move much at night, unless they are disturbed, therefore it is not likely that they are impacted negatively by the presence of the communications towers.

Hawaiian hawks (*Buteo solitarius*) are widespread throughout all forest types including the mamane-naio (*Myoporum sandwicense*) woodland (Scott et al. 1986) and therefore could be expected in the area. The hawks will not be impacted by the project since they fly during the day and will be able to see the antenna. Pacific golden plover (*Pluvialis dominica*) and pueo (*Asio flammeus*) are also likely to be present in the area. Pueo will be able to see the antenna whether flying during the day or night.

Berger (1972) mentions the endangered dark-rumped petrel (*Pterodroma phaeopygia*) at Kanakaleonui on Mauna Kea which is about 2 miles to the south of the Iolehaehae. Day et al. (2003) also suggests that the species may nest on Mauna Kea since there are records that suggest dark-rumped petrels from Hamakua and North Hilo Districts. They also suspect that they detected Newell's shearwaters at Akaka Falls, Paauilo and Hilo sampling sites (Day et al. 2003).

In response to the request of the USFWS to assess the possible presence of seabirds in the immediate vicinity of the radio site, an auditory survey was conducted at Iolehaehae between 7:00 PM and 9:30 PM on July 11, 2003 (Appendix B-1). Focal species of the survey included Hawaiian Petrels (*Pterodroma sandwichensis*), Band-rumped Petrels (*Oceanodroma castro*) and

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Newell's Shearwaters (*Puffinus auricularis newelli*). The survey methods involved listening for seabird calls and during part of the survey, the surrounding landscape was scanned using night vision goggles until clouds obscured visibility. No seabirds were seen or heard at Iolehaehae.

Potential Impacts and Mitigation Measures

Although seabirds have been known at Mauna Kea in the past (Berger 1972), recent data and the auditory survey in mid-July 2003 affirmed that this area of Mauna Kea is not utilized by seabirds.

The County project is not expected to impact any of the native and non-native species of birds and mammals in the area.

4.2.6.6 Visual Considerations

The radio facilities on Iolehaehae puu are not visible from any public roadways. Thus, the upgrading of the County's facility will not negatively affect the visual resources of the area.

4.2.7 Kahua Ranch

The facility at Kahua Ranch is a State Department of Accounting and General Services project and is described in the *Draft Environmental Assessment – Anuenue (formerly Rainbow) Radio Facilities and Tower, Kahua Ranch Site, North Kohala District, Hawaii* (Wilson Okamoto Corporation, April 2003).

4.2.8 Kailua Police Station

The new facility will include a new 100-ft self-supporting tower adjacent to the existing tower. Existing facilities will house the upgraded communication equipment. This site provides paths south to Ohia Mill and north to Moanuaiea.

4.2.8.1 Location, Access, Surrounding Use

The Kailua Cook Police Station is located just north of Kailua town, within the ahupuaa of Kealakehe, in the district of North Kona.

The site of the existing and proposed radio facilities is at the rear (west) of the Police Station building. The physical address is 74-5221 Queen Kaahumanu Highway; access is from Queen Kaahumanu Highway and Kealakehe Parkway.

The site is situated between a paved access drive and an 8-foot high chain link fence, which denotes the northerly property line. Surrounding development includes an existing 60-foot high self supporting tri-leg tower and equipment shelter to the west, fence and undeveloped property to the north, paved and unpaved parking to the east and paved access drive, underground fuel tanks, and storage building to the south. The site is flat lying at an elevation of about 97-feet.

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The surrounding area includes industrial uses and the now closed Kona Landfill. To the east on the upper slopes are the Kealakehe residential neighborhoods and the Kealakehe High School. The Honokohau Harbor and shoreline are approximately four miles to the west and Keahole Airport is approximately 5.25 miles to the northwest.

4.2.8.2 Physical Environment

The climate of the project area is characteristic of leeward Hawaii locations. The site is relatively flat at an elevation of approximately 105 feet. North Kona is on the western slope of Hualalai.

The vicinity of the Kailua Police Station site has been mapped by the U.S. Geological Survey and Stearns and McDonald as being underlain by the Hualalai volcanic series. The Hualalai volcanics consist of lava flows and vent deposits of olivine basalts with an incomplete veneer of olivine-rich basalts carrying augite phenocrysts. Several flows of alkalic basalt have been found. Lava flows consist of both pahoehoe and aa.

Potential Impacts and Mitigative Measures.

The upgrading of the Kailua Police Station radio facilities will have no negative effects on the physical environment including the climate of the area since similar facilities are already in place at this location. The site has been extensively graded in the initial development to accommodate the existing development.

4.2.8.3 Botanical / Wildlife Resources

The site is a developed facility with paved surfaces. Wildlife in the area would consist of stray cats and dogs and exotic birds common to urban areas. Thus, no adverse impacts are anticipated to flora and fauna.

4.2.8.4 Archaeological / Cultural Resources

The site has been previously graded and in use as a public facility; thus, there are no archaeological or cultural resources at the site.

4.2.8.5 Traffic

Access to the Kailua Police Station is from a signalized intersection of Kealakehe Parkway and Queen Kaahumanu Highway. In the North Kona region, the two-lane arterial Queen Kaahumanu Highway experiences heavy traffic flows during the morning and afternoon peak periods. The widening of the highway to four lanes from Kailua town to Kealakehe Parkway is planned as a first increment of the Queen Kaahumanu Highway widening project to alleviate this problem.

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Potential Impacts and Mitigative Measures

During the short-term construction period, the movement of heavy equipment, building materials, and telecommunication equipment will be transported to the site over the construction period of 4 to 6 weeks. The project is not anticipated to generate any adverse short-term or long-term traffic impacts.

4.2.8.6 Visual Considerations

The existing Kailua Police Station 60-ft self supporting radio tower is visible from along the Queen Kaahumanu Highway corridor. The mauka area of the highway in the vicinity of the project is characterized by the industrial parks, residential subdivisions, and high school along the slopes of Hualalai.

Potential Impacts and Mitigative Measures

The new 100 ft replacement tower will be placed next to the existing tower and will increase the tower height by 20 feet. The added height is not anticipated to be a significant impact within an already built environment.

4.2.9 **Kamehameha Park**

The new Kamehameha Park facility will be adjacent to the south of the existing facility, is located on the grounds of the County park and is directly adjacent (to the west) of the main gymnasium building. The improvements include a new 140-ft monopole tower. This facility provides paths to Kahua Ranch and Hamakua Police Station.

4.2.9.1 Location, Access, Surrounding Uses

Kamehameha Park is located in the town of Kapaau, within the ahupuaa of Honopueo, in the district of North Kohala.

The site of the existing and proposed radio facilities is adjacent to the Hisaoka Gymnasium within the community park facility. The access is from Akoni Pule Highway (Highway 270) and Kamehameha Park Road.

The surrounding areas include the town area of Kapaau, Kohala Hospital, and residential homes. To the west are the Kohala Club Hotel, truck farms, and Kohala Schools. A golf driving range is to the north and vacant lands to the south.

The town of Hawi is two miles to the west, Upolu Airport is 4.5 miles to the northwest, and Pololu Valley is 4 miles to the east.

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4.2.9.2 Physical Environment

The climate of the project area is characteristic of windward areas of the island. The site is relatively flat at an elevation of approximately 456 feet AMSL. This area of North Kohala is on the northern flank of Kohala Mountain.

The vicinity of the Kamehameha Park site has been mapped by the U.S. Geological Survey and Stearns and McDonald as being underlain by the Pololu volcanic series. The Pololu volcanics consist of lava flows, cinder cones and a lava dome comprised of tholeiitic, transitional, and alkalic basalt, including hawaiites containing variable percentages of olivine, plagioclase, and in the younger transitional and alkalic lavas, clinopyroxene phenocrysts. The lavas were issued from the Kohala volcano in both pahoehoe and aa type flows. The primary surface fabrics of these flows have been largely obliterated by weathering and erosion, and the flow surfaces are locally mantled by unmapped eolian and tephra-fall deposits.

Potential Impacts and Mitigative Measures.

The upgrading of the Kamehameha Park radio facilities will have no negative effects on the physical environment. The site has been extensively graded in the initial development to accommodate the existing development.

4.2.9.3 Botanical / Wildlife Resources

The site is a developed facility on a grassed lawn lined with royal palm trees. Surrounding vegetation include tall Cook Island pines and other tall trees. Wildlife in the area would consist of stray cats and dogs and exotic birds common to urban areas. The existing tower structure has been in place for 25 - 30 years.

The Newell's shearwater has been reported in the Kohala Mountains and Waipio Valley in relatively large numbers. Egg laying probably takes place at the beginning of June. Most hatching occurs between mid-July and the first week in August. Most adults leave nesting colonies by the beginning of October. The chicks fledge in October and early November. It is during this time that the Newell's shearwaters are noted for their "fall out" or "raining down" on highways, parks, football fields and buildings. The birds are attracted to lights and become disoriented (Berger 1972).

Kamehameha Park is typically well lighted and is in a region where the highest concentrations of seabirds were detected by Day et al (2003) albeit in Waipio Valley.

In response to the request of the USFWS a radar ornithological survey was conducted in early July 2003 to determine the potential for seabird occurrences at Kamehameha Park. A preliminary data summary is attached as Appendix B-2.

During July 2 - 4, 2003, ABR, Inc. conducted surveys using radar and visual methods. A total of seven (7) targets were recorded on radar over the 3 nights. Flight direction was east-west, apparently between the Kamehameha Park area and Pololu Valley. A visual recording was made

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of one individual Newell's Shearwater on the night-vision scope flying at 75 m (approximately 225 feet) above ground level.

Potential Impacts and Mitigative Measures

The immediate location of the new radio facilities will require the removal of one or two royal palms. These trees will be carefully removed and replanted in the same vicinity of the park grounds.

Through consultation with the USFWS, the County has agreed to conduct a radar ornithology survey to assess the level of seabirds transiting the area of the radio facility. The results of this survey will be presented to USFWS and the permitting agencies at the County and State.

Seabirds have been recorded by radar methods and visually seen approximately 250 feet above this location (see Appendix B-2) as they transit through this area to Pololu Valley approximately four miles to the east. According to the preliminary assessment, there is probably a fairly low probability of collision because of the layout of the park and the presence of two rows of Cook Pines at nearly right angles near the existing tower (where the replacement will go). These trees are so tall that the existing 100-ft tower sticks out above them only ~2 m. Hence, they form a good visual barrier to birds flying through this area and shield nearly the entire height of the tower.

The completed report of the radar ornithological survey will be submitted to the USFWS, the County of Hawaii Planning Department, and State DLNR upon its completion (anticipated in late-September, 2003).

In the unlikely event that a seabird collision with the tower occurs, the following mitigative measures would be taken:

- Information on Hawaiian Petrels and Newell's Shearwater will be provided to the Kamehameha Park staff to properly identify the species;
- In the unlikely event that any downed, injured birds are found, Parks Department staff will be instructed on appropriate collection methods and will notify the DLNR Division of Wildlife and Forestry staff in Waimea.

4.2.9.4 Archaeological / Cultural Resources

The site has been previously graded and in use as a public facility; thus, there are no archaeological or cultural resources at the site.

4.2.9.5 Traffic

Access to Kamehameha Park is from Akoni Pule Highway and Kamehameha Park Road.

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Potential Impacts and Mitigative Measures

During the short-term construction period, the movement of heavy equipment, building materials, and telecommunication equipment will be transported to the site over the construction period of 4 to 6 weeks. The project is not anticipated to generate any adverse short-term or long-term traffic impacts.

4.2.9.6 Visual Considerations

The existing Kamehameha Park 110-ft monopole tower is visible from Kamehameha Park Road and from within the park boundary.

Potential Impacts and Mitigative Measures

The new 140-ft replacement tower and appurtenant will be placed next to the existing facilities and will increase the tower height by 30 feet. While the increase is 27 percent the added height is not anticipated to be a significant impact within an already built environment. All existing structures will be removed after the replacement system is tested and approved.

4.2.10 Kau Police Station

Constructed in 1995, (with plans for a complete radio system) the Kau Police Station will include a 90-ft, self-supporting tower and radio enclosure behind the station. The existing radio room and generator will be used. There is presently no tower or antennas onsite. The site will provide a path southwest to Naalehu Pasture.

4.2.10.1 Location, Access, and Surrounding Uses

The Kau Police Station is located approximately one mile to the east of Naalehu town in the Kaunamano land division in the judicial district of Kau.

The site of the new radio facilities is located at the rear parking lot of the Police Station property. The physical address is 95-5353 Mamalahoa Highway; access is from Mamalahoa Highway (Highway 11).

The property is surrounded by agricultural lands and rural farmlots and residences. The town of Naalehu is approximately one mile to the west, the nearest coastline is about one mile to the east, Ka Lae (also known as South Point) is approximately 12 miles to the southwest.

4.2.10.2 Physical Environment

The site proposed for the communications system is located in a lawn area, about 100-feet south of the existing Kau Police Station building near the community of Naalehu, Hawaii. The property was extensively graded during construction of the police station with cuts of 2 to 3-feet in the driveway and parking lot north of the building and fills of 2 to 6-feet in the parking lot and lawn areas to the south of the building. The lawn area is relatively level with a ground surface

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elevation of about 478-feet. The lawn area is about 50-feet wide (north to south) and sits about 5 to 6-feet higher than the open field to the south. Vegetation at the site consists of a sparse growth of grass and several small palm trees.

The vicinity of the Kau Police Station site has been mapped by the U.S. Geological Survey and Stearns and McDonald as being underlain by the Kau volcanic series. The Kau volcanics consist of vent deposits, littoral deposits and tephra-fall deposits of tholeiitic and rarely transitional basalts. Lava flows consist of both pahoehoe and aa. The Kau volcanic series are fairly fresh, commonly bare in rocky and dry areas and are rarely over 25-feet thick except near the summit of Mauna Loa where they exceed 800-feet in thickness.

4.2.10.3 Visual Considerations

The Kau Police Station maintains a low profile along the Mamalahoa Highway as a one-story building set approximately six to eight feet below the highway elevation. The Police Station is set against a backdrop of rolling pasture lands and the ocean in the distance.

Potential Impacts and Mitigative Measures

The new radio facility will be visible from Mamalahoa Highway. To mitigate this impact, the location of the new radio facility (which includes the 90 ft self supporting tower) is planned at a site behind the Police Station building. Thus, the setback from the highway and the partial blocking of the tower by the building mass will mitigate the visual impact.

4.2.11 Kau State Building (Demolition Site)

The radio facility at the Kau State Building in the Naalehu Civic Center complex will be demolished after the Kau Police Station new facility is in operation.

4.2.12 Kauna Point (Kaiakekua)

The Kauna Point site was constructed as part of the looped microwave system project and is planned to be refurbished. This is a solar powered site. Repeater site paths are north to Ohia Mill and east to South Point.

4.2.12.1 Location, Access, and Surrounding Uses

Although this site is named "Kauna Point", the facility is approximately one mile northeast of Kauna Point and the location is more accurately described as being inland of Kaiakekua within the Manuka State Park/Natural Area Reserve. Access to the site is from Mamalahoa Highway through a 4-wheel drive road to the shoreline and along a rough jeep road which travels south and parallel to the coastline. The project site is located on an aa lava flow at the 100-ft elevation.

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4.2.12.2 Physical Environment

The Kauna Point site is near sea level and is on barren aa lava flow with little or no vegetation. Adjacent areas include pahoehoe flows with fountain grass (*Pennisetum setaceum*). The mean annual temperature is 75°F at sea level. Maximum temperatures may exceed 90°F. The area receives less than 20 inches annual rainfall. Infrequent rains are usually from the southwest and often torrential. Long dry periods are common.

4.2.12.3 Botanical Resources

The scoriaceous, clinkery, and jagged aa lava drains very quickly and there are very few areas with shallow soil. Vegetation on this harsh substrate is very sparse; plant cover may be 5 percent in low-lying areas, but on most of the flow it is less than 1 percent or absent. Hardy native species adapted to this type of environment are ohia trees (*Metrosideros polymorpha*) -- which are about 12 to 18 ft tall, maiapilo or native caper (*Capparis sandwichiana*), and uhaloa (*Waitheria indica*), a small shrub. Introduced or alien plants observed on the aa flow include sourbush (*Pluchea carolinensis*), Natal redtop grass (*Melinis repens*), running pop (*Passiflora foetida*), and hairy sword fern (*Nephrolepis multiflora*).

On the fenced project site, there are no plants. Whitish-gray crusts of a *Stereocaulon* species, a native lichen, are found covering the aa adjacent to the site.

Potential Impacts and Mitigation Measures

Plans call for the tower to be refurbished; however, if the tower needs to be replaced, then a new tower would be placed on the bulldozed access road next to the fenced area. There are no plants on the access road. There will be no impacts to botanical resources at this site.

4.2.12.4 Wildlife Resources

The wildlife survey observed only the house finch feeding on sourbush seeds. Feral goats (*Capra hircus*) were observed on the way to the site in the grassland. The area is a public hunting area.

Kauna Point site is outside the normal range of the Hawaiian hawk, there being no forest at this elevation. No pueo was observed. Jacobs (1994) reports hoary bat observations more mauka along the highway through Manuka Natural Area Reserve. The hoary bat recovery plan shows one record near Kauna Point (1997). Day et al. (2003) conducted Newell's shearwater and Hawaiian dark rumped petrel studies at Hoopuloa Point, 11 miles to the north. They recorded 1.2 targets per hour during May-June 2001 and 2002 and suggest that the targets were probably Newell's shearwater.

In response to the request of the USFWS, a radar ornithological survey was conducted in early July 2003 to determine the potential for seabird occurrences relative to the Kauna Point tower structure. A wayside location on Mamalahoa Highway at the Manuka State Park comfort/picnic

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facilities and parking lot was selected as a proxy site for Kauna Point, which lies approximately 4.5 miles downslope.

During July 5 - 7, 2003, ABR, Inc. conducted surveys using radar and visual methods. A total of one (1) target was recorded on radar over the 3 nights. Flight direction was to the west, or downslope, toward the ocean. No birds were seen on the night-vision scope.

Potential Impacts and Mitigation Measures

Kauna Point is near sea level. The existing tower is 160-ft high and the nearest sampling site of Day et al (2003) was 11 miles with only 1.2 targets per hour. The wildlife assessment suggested that it is probably unnecessary to further study this site for shearwater or petrel mortality risk assessments. However, through consultation with the USFWS, the County has agreed to conduct a radar ornithology survey in mid-July 2003 to assess the level of seabirds transiting the area of the radio facility. The field data summary of this survey is attached as Appendix B-2; the completed report is anticipated in early October 2003 and will be presented to USFWS and the affected permitting agencies at the County and State.

The low number of birds (one target over 3 nights of survey) detected on radar is not expected to cause a significant impact to seabirds; therefore no mitigation measures are warranted.

4.2.12.5 Archaeological / Cultural Resources

An archaeological and cultural resources records search within a ½ mile radius of the Kauna Point site indicated the presence of the Kaiakēkua coastal village (Archaeological Site 10-71-2159; Hawaii Register #2-21-81), approximately ½ mile from the Kauna Point radio facility site.

Potential Impacts and Mitigation Measures

The Kauna Point facilities are planned to be refurbished and all improvements will be within the enclosed existing fence. No ground alteration will occur. Moreover, the location of the radio facility is approximately ½ mile from the Kaiakēkua coastal village site. Thus, the archaeological assessment concluded that the project would have no effect on this historic site as well as no effect on the cultural resources of the Kaiakēkua site.

4.2.13 Kulani Cone

The County's Kulani Cone antennas and radio equipment are presently co-located on a 160-ft tall tower owned by Oceanic Cablevision and housed in Oceanic's shelter. The County's new 250-ft, self-supporting tower will be installed adjacent to Verizon's 175-ft tower. The height of the tower exceeds 200 feet, therefore, the FAA requirement for lights will be followed. This facility provides paths to Naalehu Pasture to the southwest, to Puna Police Station to the east northeast, and to the Public Safety Building to the northeast. Co-locaters with the County will include DOT, EMS, FBI, PBS, and HELCO.

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4.2.13.1 Location, Access, and Surrounding Uses

The Kulani Cone site is located adjacent to the south boundary of the Kulani Correctional Facility. Three Hawaii County judicial district lines converge at Kulani Cone – Puna, South Hilo, and Kau. The communication towers site is mapped within the Kau District.

Roadways that provide access to the property include Mamalahoa Highway, Kulani Road, internal Kulani Correctional Facility roads, and unpaved roads onto the cinder cone. Access is controlled at the main gate and security clearance is required to enter. Access to the summit of Kulani Cone, beyond the main campus of the correctional facility is by way of a dirt and gravel roadway extending through heavily forested correctional facility land with several unmanned locked and unlocked gates.

The property is surrounded by the Correctional Facility to the north and State Puumakaala Natural Area Reserve and Upper Olaa Forest Reserve. The Hawaii Volcanoes National Park is to the southeast and west, the Kilauea Forest and Mauna Loa Forest Reserve to the west, and the summit of Mauna Loa is approximately 20 miles further to the west.

4.2.13.2 Physical Environment

Kulani Cone is within a koa and ohia dominated mixed montane mesic forest. Mean annual temperature is 50°F. Precipitation originates in the northeast and ranges from 50 to 100 inches of mean annual rainfall. Mist is frequent.

The summit of Kulani Cone has been substantially developed with 3 (or more) existing communication facilities including towers, equipment buildings, fuel tanks, and generators. The specific site planned for the County's radio facilities is situated on the northeasterly portion of the cone, next to an existing 175-foot high tower owned by Verizon. The area is relatively flat lying, reflecting past grading activities, with heavily vegetated and forested steep slopes to the north and east. Kulani Cone has been mapped by the U.S. Geological Survey as a scoria or spatter cone comprised of Kau volcanic rocks.

4.2.13.3 Botanical Resources

The top of Kulani Cone where the existing tower and shelter are located has been graded in the past and is level in most places. Other communication towers are identified on the USGS quad maps.

The level, open grassy places support a number of weedy species: velvet grass (Holcus lanatus), broomsedge (Andropogon virginicus), beardgrass (Schizachyrium condensatum), and narrow-leaved carpetgrass (Axonopus fissifolius). Along the westside of the project site, kikuyu grass (Pennisetum clandestinum) and ricegrass (Paspalum scrobiculatum) form lumpy, thick mats up to 4 feet tall. Sedges and weedy herbaceous species found here include hairy cat's ear (Hypochoeris radicata), Cyperus polystachyos, beak-rush (Rhynchospora chinensis), and Polygonum capitatum.

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Koa/ohia montane wet forest occurs on the undisturbed sides of the cone and on the surrounding lands. This distinctly stratified native forest type has an uppermost layer consisting of an umbrella-shaped canopy of koa (Acacia koa) up to 130 feet tall. Ohia (Metrosideros polymorpha) forms another layer up to 100 feet tall, with a variety of native tree species such as olapa (Cheirodendron trigynum), kawau (Ilex anomala), kolea lau nui (Myrsine lessertiana), pilo (Coprosma ochracea), etc., 30 to 60 feet tall. Hapuu (Cibotium species) form a rather dense understory layer, 15 to 20 feet tall. A variety of shade-tolerant shrubs such as kanawao (Broussaisia arguta), manono (Hedyotis terminalis), akala (Rubus hawaiiensis), and alani (Melicope species) are scattered throughout the understory. Ground cover consists of a number of shade-tolerant ferns such as Asplenium species, akolea (Athyrium microphyllum), hoio (Diplazium sandwichianum), Dryopteris species, etc.; herbs which include alaala wai nui (Peperomia species), makole (Coprosma granadensis), Stenogyne species, etc.; and mosses and liverworts.

One endangered species (U.S. Fish and Wildlife Service 1999b), Phyllostegia velutina -- a member of the mint family with silky leaves, and one species of concern (U.S. Fish and Wildlife Service 1999a), Asplenium schizophyllum -- a fern with very finely dissected fronds, are recorded from Kulani Cone (Hawaii Natural Heritage Program database). These two species along with endangered Clermontia lindsevana and Hawaiian vetch (Vicia menziesii) are found on the adjacent Kilauea Forest Reserve and Puu Makaala Natural Area Reserve.

Largely barren areas of packed soil and red cinders occupy about 40 percent of the site. No threatened and endangered species or species of concern are found on the top of the cone where it has been disturbed. The disturbed areas support mostly introduced or alien plants, although a few native plants are occasionally found. These native plants tend to prefer the more open areas such as forest edges. Native plants observed on the project site are the matted uluhe fern (Dicranopteris linearis), Cyperus polystachyos and beak-rush (Rhynchospora chinensis) sedges, heupueo grass (Agrostis avenacea), waewaeiole (Lycopodiella cernua), and saplings of ohia. The ohia is the only endemic species, all the others are indigenous.

Potential Impacts and Mitigation Measures

The new emergency radio facility at Kulani Cone is not expected to have a significant negative impact on the botanical resources. All construction activities will be confined to the disturbed, grassy, level areas. Any excavated material will be controlled and will not be disposed of by pushing it over the side of the cone. No replanting of vegetation is needed as the weedy plants already found on the adjoining grassy areas are expected to colonize any newly disturbed spots.

4.2.13.4 Wildlife Resources

A wildlife survey was conducted on April 22, 2003 between 10:13 and 10:40 hours under overcast conditions, with drizzle and winds of about 25 mph. The survey was conducted by walking down the access road from the top of the puu to its base.

The endemic apapane (Himatione sanguinea) was the most abundant species encountered during the brief survey. Next in abundance were the native omao (Myadestes obscurus) and the

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introduced red billed leiothrix (*Leiothrix lutea*). Other introduced species encountered were the northern cardinal, kalij pheasant, Japanese white-eye and the house finch. Only one native amakihi was seen. No other native species were encountered, however, Hawaii Natural Heritage database (April 10, 2003) show records of the federally listed endangered Hawaiian hawk, ou (*Psittirostra psittacea*), akiapolaau (*Hemignathus munroi*), Hawaii creeper (*Oreomystis mana*), and Hawaii akepa (*Loxops coccineus coccineus*) occurring near the site. The database also shows a 1941 record of the Hawaiian crow (*Corvus hawaiiensis*), but it is now considered to be absent from the area.

No pueo (*Asio flammeus*) or barn owl (*Tyto alba*) was seen, the area is marginal for owls due to the dense forest type, but they may be present in adjacent areas cleared of forest and used as pasture.

Hawaiian dark-rumped petrels have been reported on Mauna Loa within Hawaii Volcanoes National Park (Day et al. 2003). Newell's shearwaters are believed to nest at moderate elevations on the southeastern slopes of Mauna Loa (Day et al. 2003). Day et al. (2003) conducted radar surveys of these species at Holei Sea Arch (about 20 miles southeast of Kulani Cone) along the southeast coast of the island and found 1.2 targets per hour from May-June 2001 and 2002 suggesting that Newell's shearwaters were the most likely species passing through the Holei Sea Arch site. At coastal Punaluu (about 26 miles to the south of the site) they found 1.6 targets per hour; however, the identity of the targets at Punaluu were unknown and suggested that both the petrel and the shearwater were sampled at the site.

In response to the request of the USFWS, a radar ornithological survey was conducted in early July 2003 to determine the potential for seabird occurrences at the Kulani Cone radio site.

During July 8 - 12 2003, ABR, Inc. conducted surveys over five nights using radar and visual methods. No or zero (0) targets were recorded over the three (of the five) nights of ideal sampling conditions. The data summary (Appendix B-2) concludes that the Kulani Cone location appears to have no birds flying over it.

No rodent trapping was conducted but it is expected that the roof rat is present. The house mouse would also be expected. Feral pigs are known to be in the area.

Potential Impacts and Mitigation Measures

Through consultation with the USFWS, the County agreed to conduct a radar survey in July 2003 when peak numbers of seabirds would have been expected in the Kulani Cone area. The results of this survey indicate that there are no (or essentially no) seabirds transiting the Kulani Cone radio facility site. Thus, no mitigation measures are warranted

Any lighting requirement will follow the guidelines of the FAA and will also be disclosed to the resource agencies.

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4.2.13.5 Visual Considerations

Kulani Cone and the existing Verizon tower are generally not visible from major roadways except fleetingly from Mamalahoa Highway between the Hawaii Volcanoes National Park and Kapapala Ranch approximately 15 miles to the south and from residential roadways within Volcano Village.

The County's Kulani Cone antenna provides paths to Naalehu Pasture to the southwest, Puna Police Station to the east northeast, and the Public Safety Building in Hilo to the northwest over forested lands. Over the past several decades since the initial installation of the existing facilities, trees have matured and grown enough to now require additional height at the Kulani Cone tower. Moreover, the site for the new tower is approximately 25 feet lower in grade than Oceanic's site which supports the 180-ft tall existing tower on which the County's antennas are co-located. Thus, the net increase in height at the top of the Oceanic and new County tower will be approximately 45 feet.

Potential Impacts and Mitigation Measures

According to the system path map shown in Figure 2C, the required height of the County's new tower is 250 feet; the antenna which will transmit to Naalehu Pasture is at 245 feet above ground level. To minimize the visual impact, the tower height is planned as recommended and will not be any taller than required. The new tower site is directly adjacent to the 175-ft tall Verizon self supporting tower due to the limited area of the summit of Kulani Cone. Thus, two towers would be visible; however the public views of the towers will be over long distances from limited segments of Mamalahoa Highway and Volcano.

4.2.14 Moanuaiea

The replacement Moanuaiea facility, including an 80-ft self-supporting tower, will be adjacent to the existing facility. This facility provides paths to Kailua Police Station and to Kahua Ranch. The FBI will co-locate at this site.

4.2.14.1 Location, Access, and Surrounding Uses

The Moanuaiea site is above the Makalei Hawaii Country Club (72-3890 Hawaii Belt Road, Kalaoa 96740) in the district of North Kona. Access is from Hawaii Belt Road (Hwy 190), through the golf course property, and through a 1.5-mile ranch road to the radio facility.

The site is located atop Moanuaiea, a scoria/spatter cone. The summit of Moanuaiea has been substantially developed with existing communication facilities including towers, equipment shelters, fuel tanks, and generators. The specific site planned for the new communications system is situated in the central portion of the cone, next to an existing approximate 50-foot high tower. The area is relatively flat lying, reflecting past grading activities, with heavily vegetated and forested steep slopes to the north, east, south and west. Surface conditions consist of a very dense growth of grass and exposed volcanic ejecta. Access to the summit of Moanuaiea, beyond the golf course clubhouse is by way of a dirt and gravel roadway extending about 1-1/2

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winding miles through heavily forested land with several unmanned locked and unlocked gates. The last approximate 3/4-mile of the access road is steep to very steep, narrow with sharp turns and covered with soils and grass. Moanuahea has been mapped by the U.S. Geological Survey as a scoria or spatter cone comprised of Hualalai volcanic rocks.

The radio site is at 3,214 ft MSL and surrounded by the Huehue Ranch property. The Huehue Ranch radio facility is at elevation 3,304 ft MSL.

4.2.14.2 Physical Environment

The annual mean temperature in the area of this facility is 60°F. Rains originate from the north east with annual rainfall between 40-60 inches. During normal times dry periods of more than one month are uncommon. The topography is steep with good soil. Adjacent areas are in use for pasturage and golf course.

Potential Impacts and Mitigation Measures

Construction will require transporting of heavy equipment and large loads through the narrow and steep dirt roads. Segments of the road would require gravel reinforcement to create a safe driving surface during construction.

4.2.14.3 Botanical Resources

The roadway to the site is narrow and composed of weedy species and silky oak (*Grevillia robusta*) trees. Silk oak is an aggressive exotic specie that is now naturalized over much of the island and is considered a pest specie. A description of the vegetation along the access road is found in Appendix A-1.

The Moanuahea site is at 3,214 ft. elevation. The project site and the surrounding lands are used for grazing cattle and horses. The Kikuyu grass (*Pennisetum clandestinum*)-covered pasture land is lush and thick due to the fairly deep, loamy soils and good amount of rainfall (50 to 100 inches per year). The pastures are well managed with only a few weedy shrubs such as Christmas berry (*Schinus terebinthifolius*) and guava (*Psidium guajava*). Forage species such as Spanish clover (*Desmodium incanum*), white clover (*Trifolium repens*), and African dropseed grass (*Sporobolus africanus*) are common to locally abundant. Weedy species occur in smaller numbers and include narrow-leaved plantain (*Plantago lanceolata*), weed verbena (*Verbena litoralis*), vervain (*Stachytarpheta australis*), and purple cudweed (*Gamochaeta purpurea*). A few clumps of the noxious fireweed (*Senecio madagascariensis*) are found here. It is a member of the daisy family with clusters of bright yellow flowers; it is unpalatable and, perhaps, toxic to livestock.

Cyperus polystachyos, a member of the sedge family, was the only native species recorded from the area around the existing tower and shelter and on the new tower site. *Cyperus* is indigenous; it is native to the Hawaiian Islands and tropical and subtropical regions worldwide

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Heavy equipment and large loads will be transported to the site over the length of the narrow access roadway. Approximately 40 – 50 smaller caliper (less than 6 inches) silk oak trees will need to be removed along the roadway. This is a pest specie that has been targeted for control by the resource agencies.

The area of the existing facilities and the new tower facility has been disturbed in the past. One native sedge was identified; however, this plant is locally common and dispersed in other similar environments. The proposed improvements are not expected to have an adverse impact on the botanical resources.

4.2.14.4 Wildlife Resources

A number of introduced game bird species were observed during a wildlife field survey; Erkel's francolin, peafowl (*Pavo cristatus*), ring necked pheasant, spotted dove and turkey. Northern cardinals and Japanese white-eyes were also seen.

No native forest birds were seen, however, the site is within known ranges of low densities of apapane and higher densities of amakihi (Scott et al.).

The site is within the known distribution range of the Hawaiian hoary bat. Bats have been observed all along the western coast of the island along Mamalahoa Highway (Jacobs 1994). Hawaiian hawks were not observed during the survey but the site is within the known range of the hawk (Scott et al. 1986). No pueo or barn owl was seen, they may be present however, especially in the pasture land.

The Moanuaiea area is not known to be an area where seabirds are commonly seen (Day et al. 2003) and thus, no seabirds are anticipated at this site.

Potential Impacts and Mitigative Measures

The project involves replacing an existing tower in an area where several towers are present. The Hawaiian hawk, Pueo, and forest birds may inhabit the area, however, these birds will be able to see the unguyed new tower during day or night flights and will unlikely collide into the tower. Hawaiian hoary bats may also range within this area, bats fly at night and use echolocation to navigate and forage on flying insects, and therefore it is highly unlikely that they would collide with the tower structure. No forest habitat alteration is planned as part of this project. Seabirds are not common to the area. Thus, no adverse effects to native birds and other wildlife are anticipated at this location.

4.2.14.5 Archaeological / Cultural Resources

An archaeological and cultural assessment was conducted for the Moanuaiea site. A site reconnaissance indicated that previous clearing and machine grading of the new location for the radio facilities. In addition, a records search for historic sites within a 0.5 mile radius did not

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reveal any sites at or in the near vicinity of the project. The assessment concluded that the new replacement radio facilities would have "no effect" on the historic and cultural resources.

4.2.14.6 Visual Considerations

The radio facility site is not visible from any major roadways; thus no adverse impacts are anticipated.

4.2.15 Naalehu Pasture

The Naalehu Pasture site will consist of a replacement 100-ft self-supporting tower. This facility provides paths to Kau Police Station to Kulani Cone and South Point.

The following agencies will co-locate with the County at this location: DLNR, DOT, EMS, FBI, HELCO

4.2.15.1 Location, Access, and Surrounding Uses

The Naalehu Pasture site is located directly south of the town of Naalehu, in the ahupuaa of Kahilipali Nui, in the district of Kau. Access to the site is via Mamalahoa Highway and unpaved ranch roads.

The radio facility site is in the midst of a cattle ranch. A cattle corral is located next to the radio facilities site. The location is approximately 1.5 miles south of Naalehu town. The Pacific Ocean is approximately 1.5 miles to the east and south beyond the Maniania Pali.

4.2.15.2 Physical Environment

The topography of the Naalehu Pasture site is characterized by pasture lands sloping towards the coastal area with lava rock outcroppings. The mean annual temperature is 70°F. Annual rainfall is 20-40 inches.

Several existing communication/ broadcasting towers and above-ground water tanks are clustered in the immediate vicinity of the County facility. The County's replacement tower will be located on the north side of an existing equipment shelter, which is situated atop a small rocky hill or puu composed of pahoehoe lava at an elevation of about 632-feet. The pahoehoe lava has been partially graded (cut) to accommodate an existing access drive along the north side of the equipment shelter, to the top of the lava flow. Topographic differential in the immediate area of the planned tower (between tower legs) is about 5 to 6-feet. Ground cover consists of a sparse growth of grass, weeds and small trees.

The underlying soil is mapped as the Kau volcanic series which consist of both pahoehoe and aa. The Kau volcanic series are fairly fresh, commonly bare in rocky and dry areas and are rarely over 25-feet thick except near the summit of Mauna Loa where they exceed 800-feet in thickness.

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Potential Impacts and Mitigative Measures

The upgrading of the Naalehu Pasture radio facilities will have no negative effects on the physical environment including the climate and topography of the area since similar facilities are in place at this location.

4.2.15.3 Botanical Resources

The vegetation on top of the puu is patchy with large areas of barren, weathered pahoehoe. It consists of low clumps of Guinea grass (Panicum maximum) and scattered koa haole shrubs (Leucaena leucocephala), with a few weedy species which include comb hyptis (Hyptis pectinata), bur bush (Triumfetta rhomboidea), Spanish needle (Bidens aiba var. radiata), false mallow (Malvastrum coromandelianum), partridge pea (Chamaecrista nictitans), Boerhavia coccinea, uhaloa (Waltheria indica), and Portulaca pilosa. Bermuda grass (Cynodon dactylon) forms a fair-sized mat around the existing tower. Most of the vegetation has been grazed by cattle.

Koa haole thicket, 6 to 12 ft. tall, with a few Christmas berry shrubs (Schinus terebinthifolius) is found on the sides of the puu where it is steeper and there are piles of large boulders. A few native plants occur among the boulders. These are the koali awa (Ipomoea indica), a member of the morning glory family; iliee (Plumbago zeylanica), a sprawling shrub with clusters of white flowers; and kakalaioa (Caesalpinia bonduc), a scandent shrub with yellow flowers and prickly young leaves. The koali awa, iliee, kakalaioa and uhaloa are indigenous, i.e., native to the Hawaiian Islands and elsewhere.

Potential Impacts and Mitigative Measures

The area of the existing facilities and the new replacement tower facility has been disturbed in the past. Four native species were identified; however, these (koali awa, iliee, kakalaioa and uhaloa) are indigenous and locally common and dispersed in other similar environments. The proposed improvements are not expected to have an adverse impact on the botanical resources.

4.2.15.4 Wildlife Resources

Small mammals which are expected at the site include the Indian mongoose (Herpestes auropunctatus), feral cats (Felis catus), dogs (Canis familiaris), the black rat, Norway rat (Rattus norvegicus) and the house mouse.

The site is within the known distribution range of the Hawaiian hoary bat. Bats have been observed all at South Point and along Mamalahoa Highway, about 5 miles west of Naalehu town (Jacobs 1994). Hawaiian hawks were not observed during the survey but the area is within the known range of the hawk (Scott et al. 1986) although open savanna, is outside the normal range of the species (Scott et al. 1986). Also likely to be present are Pueo and barn owl, especially in the pasture land environment. The only indigenous bird observed during the survey was the Pacific golden plover.

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The most numerous bird species found at the site included the following: Yellow fronted canary (*Serinus mozambicus*), Zebra doves (*Geopelia striata*) and the common myna (*Acridotheres tristis*). There were also northern cardinals (*Cardinalis cardinalis*), spotted doves (*Streptopelia chinensis*), house finches, yellow billed cardinals (*Paroaria capitata*), saffron finches (*Sicalis flaveola*) and Japanese white-eyes (*Zosterops japonicus*) (listed in order of abundance).

The survey was conducted during March, when it is unlikely to encounter any Newell's shearwater or Hawaiian dark-rumped petrels. Day et al. (2003) monitored a site at Punaluu which is about 7.7 miles northeast of the site and found 1.6 targets per hour, however, the species could not be determined. It is difficult to extrapolate their results at Punaluu to the Naalehu Pasture site since topographic features are very different. Topography can be an important factor in flight routes for the Newell's shearwater, but apparently less so for dark rumped petrel (Cooper and Day 1992).

Potential Impacts and Mitigative Measures

The project involves replacing an existing tower in an area where several towers are present. The Hawaiian hawk and Pueo may inhabit the area, however, these birds will be able to see the un-guyed new tower during day or night flights and will unlikely collide into the tower. Hawaiian hoary bats may also range within this area, bats fly at night and use echolocation to navigate and forage on flying insects, and therefore it is highly unlikely that they would collide with the tower structure. Seabirds are known in the area of Punaluu approximately 7.7 miles to the northeast and may also transit this area. The tower will be an unlit self-supporting structure. Thus, no adverse effects to native birds and other wildlife are anticipated at this location.

4.2.15.5 Archaeological / Cultural Resources

An archaeological and cultural impact assessment was conducted for the Naalehu Pasture site. A site reconnaissance noted the previous clearing and machine grading of the existing and new locations for the radio facilities. Rock mounds were noted below the puu where the radio facility sits. In addition, a records search for historic sites within a 0.5 mile radius did not reveal any sites at or in the near vicinity of the project.

The assessment report recommends that construction activities and vehicle parking does not impact the area below the puu where numerous uninvestigated rock mounds are located.

The assessment concluded that the new replacement radio facilities would have "no effect" on the historic and cultural resources, provided that the rock mounds are undisturbed.

Potential Impacts and Mitigative Measures

A construction staging area will be established away from the rock mounds which will be demarcated with yellow construction flagging to assure that they are undisturbed.

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4.2.15.6 Visual Considerations

The increase of the tower facility height from 50 feet to 100 feet represents a 100 percent increase in height. This and the other towers at this site are visible from the ranch roads but not from any major public roadways. Thus, the visual conditions are altered; however, the County's new tower is located with other towers to minimize the impacts and the original existing tower which will be removed after the total system is transitioned to the new system.

4.2.16 Ohia Mill

The Ohia Mill microwave facility will consist of a 150-ft self-supporting tower. This facility provides paths to Kauna Point to the south, and Kailua Police Station and Captain Cook Police Station to the north. The co-locaters at this site include the following: DLNR, DOT, EMS, FBI, HELCO.

4.2.16.1 Location, Access, and Surrounding Uses

The Ohia Mill site is located on the Yee Hop Ranch, in the ahupuaa of Alika, in the district of South Kona. Access to the site is via Mamalahoa Highway and unpaved ranch roads.

A caretaker's residence is approximately 100 yards from the radio facility site.

The radio facility site is at 2,355 feet elevation about 1.25 miles east of Mamalahoa Highway near the abandoned site of Ohia Mill north of the community of Papa in South Kona, Hawaii.

4.2.16.2 Physical Environment

The Ohia Mill site is in a degraded ohia forest. The annual mean temperature within this zone is 60°F. Rains originate from the north east with annual rainfall between 40-60 inches. Dry periods of more than one month are uncommon. The topography is steep with lava substrate. The forest was ohia with mixed introduced species of Christmas berry, silk oak, guava and cherry guava. The forest adjacent to the project site had been cleared for pasture and macadamia nuts.

The site proposed for development is located immediately adjacent to the north-northwest of the County's existing communications system in a fenced area of pastureland. The existing communications system consists of a 100-foot high tri-leg self-supporting tower, equipment shelter and propane tank enclosed with an 8-foot high chain link fence. The site has been graded in the past to accommodate the existing communications compound with cuts in the area of the existing tower on the order of about 3 to 4-feet and fills along the southerly portion of the area on the order of 10 to 15-feet. Topography across the proposed communications system area is approximately 3 to 4-feet with surface conditions consisting of exposed lava with a thin covering of grass.

The Ohia Mill site is located on the westerly flank of Mauna Loa. The vicinity of the Ohia Mill site has been mapped as being underlain by the Kau volcanic series. The Kau volcanics consist

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of vent deposits, littoral deposits and tephra-fall deposits of tholeiitic and rarely transitional basalts. Lava flows consist of both pahoehoe and aa. The Kau volcanic series are fairly fresh, commonly bare in rocky and dry areas and are rarely over 25-feet thick except near the summit of Mauna Loa where they exceed 800-feet in thickness.

Potential Impacts and Mitigative Measures

The upgrading of the Ohia Mill radio facilities will have no negative effects on the physical environment including the climate and topography of the area since similar facilities have been in place at this location.

4.2.16.3 Botanical Resources

The existing tower and shelter and the site for the new facilities are located on Kikuyu grass (Pennisetum clandestinum) pasture land with scattered stands of ohia (Metrosideros polymorpha) and silk oak (Grevillea robusta) trees. Besides Kikuyu, other forage plants observed on the site include two legume or pea family members: Spanish clover (Desmodium incanum) and Neonotonia wightii, and African dropseed grass (Sporobolus africanus). Weedy species are associated with disturbed, exposed soil-covered patches and include vervain (Stachytarpheta australis), beardgrass (Schizachyrium condensatum), narrow-leaved plantain (Plantago lanceolata), nettle-leaved goosefoot (Chenopodium carinatum), pamakani (Ageratina riparia), and balloon plant (Asclepias physocarpa). Around the existing structures, there are a few ti leaf plants (Cordyline fruticosa).

Ohia is the only native plant recorded from the site. It is endemic, i.e., native only to the Hawaiian Islands.

Potential Impacts and Mitigative Measures

The area of the existing facilities and the new tower facility has been disturbed in the past. Only the ohia was identified as a native species. No trees will be removed to construct the new facilities. Thus, the proposed improvements will not have an adverse impact on the botanical resources.

4.2.16.4 Wildlife Resources

House finches were the most abundant bird at the site. There was also spotted doves, zebra doves, northern cardinal, saffron finch and Japanese white eyes observed on site. Only one native bird, the apapane, was seen in an ohia tree on the surrounding area of the radio facilities site.

Domestic sheep and goats were being raised in the pasture. Feral pig trails and droppings were found outside the fence project site. Macadamia nuts were dumped on the ground and pig trails radiated out from the dumpsite. No rodent trapping was conducted but it is expected that all three species of Rattus would be present since there were forest, field and human habitation. The house mouse would also be expected.

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The site is within the known distribution range of the Hawaiian hoary bat. Bats have been found all along the southwestern coast of the island (Jacobs 1994) along the Mamalahoa Highway survey area. Hawaiian hawks were not observed but the site is within the known range of the hawk (Scott et al. 1986). No Pueo or barn owl was seen, they may be present however, especially in the open fields.

The survey was conducted during March, when it is unlikely to encounter any Newell's shearwater or Hawaiian dark-rumped petrels. Day et al. (2003) conducted radar surveys of these species at Hoopuloa, 3.2 miles to the southwest along the coast and found 1.2 targets per hour from May-June 2001 and 2002. They suggest that the targets were probably Newell's shearwater.

Potential Impacts and Mitigative Measures

The Hawaiian hawk and Pueo and may inhabit the area, however, these birds will be able to see the ungued new tower during day or night flights and will unlikely collide into the tower. Hawaiian hoary bats may also range within this area, bats fly at night and use echolocation to navigate and forage on flying insects, and therefore it is highly unlikely for the construction of the replacement facilities that they would collide with the tower structure. The forest habitat will not be modified; therefore, forest birds will not be affected.

Seabirds are known in the area of Hoopuloa approximately 3.2 miles to the northeast and may also transit this area. The tower will be an unlit self supporting structure; thus, no adverse effects to native birds and other wildlife are anticipated at this location.

4.2.16.5 Archaeological / Cultural Resources

An archaeological and cultural assessment was conducted for the Ohia Mill site. A site reconnaissance indicated the previous clearing and machine grading of the radio facilities site. In addition, a records search for historic sites within a 0.5 mile radius did not reveal any sites at or in the near vicinity of the project. The assessment concluded that the new replacement radio facilities would have "no effect" on the historic and cultural resources.

4.2.16.6 Visual Considerations

The radio facility site is not visible from any major roadways; thus no adverse impacts are anticipated.

4.2.17 Public Safety Building

The Public Safety Building existing facility 100-ft, self-supporting tower will be refurbished. The facility provides paths to the County Baseyard to Fire Central and to Kulani Cone.

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4.2.17.1 Location, Access, and Surrounding Uses

The Public Safety Building is located at elevation 92 feet AMSL at 349 Kapiolani Street in Hilo, district of South Hilo. The Public Safety Building is Hawaii Police Department's main headquarters.

Hilo Bay is approximately 2,000 feet to the east northeast and the Hilo International Airport is approximately 1.5 miles to the east.

4.2.17.2 Physical Environment

The site is a developed facility with paved surfaces and landscape lawns. Wildlife in the area would consist of stray cats and dogs and exotic birds common to urban areas. The site has been previously graded and in use as a Police Station; thus, there are no archaeological or cultural resources at the site.

Potential Impacts and Mitigative Measures

The Public Safety Building radio facilities are relatively new; the facilities will be refurbished with new antennas and radio equipment. There will be no ground alterations (e.g. including grading) or site work and thus, no adverse effects are anticipated.

4.2.17.3 Visual Considerations

Hilo is characterized by commercial office buildings, apartment buildings, and small business enterprises. The Public Safety Building is situated away from the Downtown Hilo historic section along the main bayfront roadway. The existing tower structure is surrounded by tall buildings and some trees in the area. No new changes to the existing environment are planned, thus no adverse impacts to the environment are anticipated.

4.2.18 Puna Police Station

The new radio facility at the Puna Police Station will be a 100-ft monopole tower in the back parking lot of the police station building. This facility is a spur which communicates with Kulani Cone.

4.2.18.1 Location, Access, and Surrounding Uses

The Puna Police Station is located at 16-200 Pilimua Street in the town of Keaau, district of Puna. The site is accessed from Mamalahoa Highway and the Old Volcano Highway.

Surrounding uses include the County Fire Station (including an approximately 25-ft high hose tower) and Courthouse. Across the street to the west is the Keaau Town Center shopping complex and to the south is a vacant parcel which is planned as a site for a new hotel.

Hilo is approximately 4 miles to the north of Keaau.

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4.2.18.2 Physical Environment

The site is located in the north-central portion of the existing Puna Police Station property. The site is in a small lawn area, between a paved access drive/parking lot and an 8-foot high chain link fence mounted on a 9-ft high rock retaining wall. The site is flat lying at an elevation of about 362-ft. The site has been extensively graded in the past with fill depths up to about 10 feet. Above-ground fuel storage tanks are located to the east and west of the site.

4.2.18.3 Visual Considerations

Keaau today still retains the character of a plantation-style community, although sugar is no longer the mainstay of the economy. Much of this area of Keaau is characterized by plantation style homes and buildings. The existing radio tower facility located at the west corner of the station along Old Volcano Highway has a low-profile as a 30-ft high tower.

Should a new Puna Police Station be built within the 20-year life expectancy of the proposed replacement radio facilities, the County will also re-locate the tower and antennas, equipment cabinet, and appurtenant structures to the new site.

Potential Impacts and Mitigative Measures

The proposed 100-ft monopole tower is necessary due to the growth in vegetation in the surrounding areas. In the past, vegetation on the surrounding lands consisted of sugar cane which reached a maximum height of about 10 to 15 feet. Over the past 20 years since the closure of Puna Sugar Company, much taller trees have grown in old sugar fields. This necessitates the 100-ft tall tower. To address the community's visual concerns, a monopole tower will be installed (instead of a self-supporting tower). The profile of the monopole tower is less obtrusive than the lattice style self supporting tower. A photo simulation of the new facilities is shown on Figure 22C.

4.2.19 South Point

The South Point replacement facility includes a new 80-ft, self-supporting tower adjacent to the existing facility. This facility provides paths northeast to Naalehu Pasture and to west to Kauna Point.

DLNR, EMS, FBI, HVO, NOAA, PBS, and HELCO will co-locate with the County at this site.

4.2.19.1 Location, Access, and Surrounding Uses

The South Point site is located on pastureland to the west of South Point Road, in the land division of Pakini, in the district of Kau. Access to the site is via Mamalahoa Highway and South Point Road.

The radio facility site is in the midst of a cattle ranch; two water tanks are in the area of the existing and new facilities. The location is approximately 4 miles south of Mamalahoa Highway

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and approximately 7 miles southwest of Naalehu town. Ka Lae (or South Point) and the Pacific Ocean are approximately 10 miles to the south of the radio facility.

The project is on KSBE lands (leased to Daleco Ranch) and surrounded by pastureland. It is approximately 4 miles south of Mamalahoa Highway and accessed from South Point Road and an unimproved dirt road through open pastureland over approximately 3,500 feet. Access is through a locked gate. HELCO power lines provide electricity to the site.

4.2.19.2 Physical Environment

The topography is flat but gently sloping makai with a swale nearby. The mean annual temperature is 70°F. Annual rainfall within this zone is 20-40 inches. The topography is characterized as coastal flats with adjacent sloping lands with lava outcrops. The unnamed natural drainage swale originates approximately 2.75 miles mauka at elevation 1,400 ft MSL and flows seaward on the east side of the site.

Two other guyed telecommunications towers and two above-ground water tanks are situated at this site. The proposed tower will be located on the east of the existing radio facilities on level pasture land at elevation 1,206 ft AMSL. Approximately a mile to the south is a windmill farm. The underlying soil is mapped as the Kau volcanic series which consist of both pahoehoe and aa. The Kau volcanic series are fairly fresh, commonly bare in rocky and dry areas and are rarely over 25-feet thick.

Potential Impacts and Mitigative Measures

The upgrading of the South Point radio facilities will have no negative effects on the physical environment including the climate and topography of the area. Grading will be limited to the 35 ft x 40 ft area (1,400 sq ft) of the fence enclosed facilities.

There will be no alteration of the unnamed drainage swale; erosion control measures will be specified on the grading plans for this site.

4.2.19.3 Botanical Resources

The vegetation of the area and the site is limited to common pasture grasses dominated by Kikuyu grass (Pennisetum clandestinuni). Guinea grass (Panicum maximum) and smutgrass or African dropseed (Sporobolus africanus) are occasional, occurring as scattered clumps. All three grasses are native to tropical Africa and were originally introduced for forage. Neonotonia wightii, a twining perennial vine and member of the pea family, is occasional. It is native to tropical America and was brought in as a fodder plant. Other plants occur here in smaller numbers and include peppergrass (Lepidium virginicum), apple of Sodom (Solanum linnaeanum), slender amaranth (Aniaranthus viridis), wiregrass (Eleusine indica), goosefoot (Chenopodium murale), scarlet pimpernal (Anagallis arvensis), and popolo (Solanum americanum). Patches of lantana shrubs (Lantana camara), 2 to 3 feet tall, are common in adjacent, low-lying swale areas.

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The only native plant found on the site is the popolo, a member of the nightshade or tomato family. It is an indigenous species, occurring naturally in the Hawaiian Islands and in tropical and warm temperate areas.

Potential Impacts and Mitigative Measures

The area of the existing facilities and the replacement tower facility has been disturbed in the past. Only the popolo was identified as a common native species. The proposed improvements will not have an adverse impact on the botanical resources.

4.2.19.4 Wildlife Resources

Domestic cattle grazed throughout the site during the field investigation. Although not observed, small mammals expected to be present at the site include the small Indian mongoose, feral cats, dogs, and rodents.

Jacobs (1994) recorded the Hawaiian hoary bat at South Point and along Mamalahoa Highway about 5 miles west of Naalehu town.

Common birds found at the site included the yellow fronted canary, Eurasian skylark, and the migratory Pacific golden plover, yellow billed cardinals, Japanese white-eyes, Zebra doves, northern cardinals, house finches, and common mynas.

The South Point site is outside the normal range of the Hawaiian hawk. Day et al. (2003) conducted surveys for Newell's shearwater or Hawaiian dark rumped petrels at Punaluu (13 miles to the northeast) and at Hoopuloa (19 miles to the northwest) but no monitoring was conducted at South Point. They suggested that the targets detected at Hoopuloa were more likely Newell's shearwaters. As long as no lighting is installed to disorient the birds in inclement weather, it is unlikely that these nocturnally active birds will collide with the replacement antenna.

Potential Impacts and Mitigative Measures

The project involves replacing an existing tower in an area where several towers are present. The Hawaiian hoary bats may range within this area, bats fly at night and use echolocation to navigate and forage on flying insects, and therefore it is highly unlikely that they would collide with the tower structure. Seabirds are known in the area of Punaluu approximately 7.7 miles to the northeast and may also transit this area. The tower will be an unlit self supporting structure; thus, no adverse effects to native birds and other wildlife are anticipated at this location.

4.2.19.5 Archaeological / Cultural Resources

An archaeological and cultural assessment was conducted for the South Point site. A site reconnaissance indicated the previous clearing and machine grading of the site. In addition, a records search for historic sites within a 0.5 mile radius did not reveal any sites at or in the near

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vicinity of the project. The assessment concluded that the new replacement radio facilities would have "no effect" on the historic and cultural resources.

4.2.19.6 Visual Considerations

The radio facility site is visible from South Point Road. This site supports several existing telecommunications towers. The new County tower will be an 80-ft tall self supporting tower, this is the same height as the existing tower. After the full system is in place and operating, the old tower will be removed to a County approved location for disposal. Thus there will be no net increase in the visual environment, and no increased adverse impacts are anticipated.

4.2.20 Waimea Police Station

The Waimea Police Station facility improvements will involve the refurbishing of the existing 120-ft self-supporting tower. This facility is a spur which communicates with Huehue Ranch.

4.2.20.1 Location, Access, Surrounding Use

The Waimea Police Station is within a civic center complex in the district of South Kohala. The civic center also includes the Waimea Fire Station.

The site of the radio facilities is at the side (north end) of the Police Station building. The physical address is 57-5185 Kamamalu Street, access is from Mamalahoa Highway.

This Waimea Civic Center is in the midst of the business center of Waimea and surrounded by commercial businesses, offices, shopping centers, and the headquarters of historic Parker Ranch. The intermittent Lanimaumau Stream is to the south of Mamalahoa Highway and traverses through open fields.

The Waimea-Kohala Airport is approximately 1.5 miles to the southwest.

4.2.20.2 Physical Environment

The Lanimaumau Stream channel is to the south of the civic center complex. The area is mapped as Zone X and AE. The distance separating the Waimea Police Station and the Lanimaumau Stream is approximately 1,800 ft; thus, no adverse effects are anticipated.

The climate of the project area is characterized by its higher elevation and temperatures are generally very consistent with average daily temperatures ranging from 55 degrees F to 75 degrees F. Rainfall is variable and averages about 40 to 50 inches per year. The site is relatively flat at an elevation of approximately 2,727 feet. South Kohala is located on the southern foothills of the Kohala Mountain.

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Potential Impacts and Mitigative Measures.

The refurbishing of the Waimea Police Station radio facilities will have no negative effects on the physical environment including the climate of the area. Moreover, to accommodate the existing development, the site was extensively graded in the past.

4.2.20.3 Traffic

Mamalahoa Highway through Waimea is a heavily trafficked roadway and congestion can be significant. The State Department of Transportation planning of a By-Pass Road is in progress as a long-term solution to alleviate this problem.

Potential Impacts and Mitigative Measures

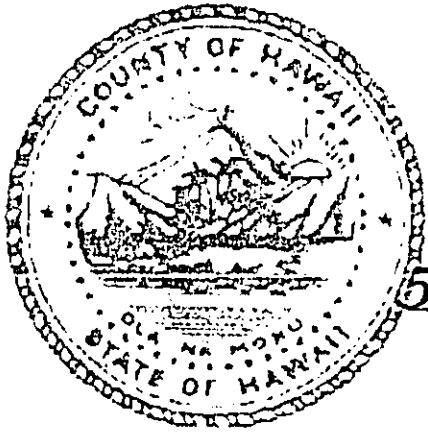
During the short-term construction period, the movement of heavy equipment, building materials, and telecommunication equipment will be transported to the site over the construction period of 4 to 6 weeks. As warranted, traffic control officers will be assigned to direct traffic during heavy equipment movement at the Mamalahoa intersection. Heavy equipment will be transported to the site during off-peak periods. Thus, no long-term traffic impacts are anticipated.

4.2.20.4 Visual Considerations

The town of Waimea is well known for its rural paniolo character established by the historic Parker Ranch. The Police Station is situated along Mamalahoa Highway at the town core and is surrounded by office buildings.

Potential Impacts and Mitigative Measures

The existing 120-ft monopole will be refurbished; thus there will not be any new visual impact.



5. ALTERNATIVES TO THE PROPOSED ACTION

5.0 ALTERNATIVES TO THE PROPOSED ACTION

The provisions of Title 11, Environmental Impact Statement Rules, Section 11-200-17(f) require an analysis of the alternatives which could attain the objectives of the action, while minimizing potential adverse environmental impacts.

The County's objective is to upgrade its existing outdated emergency radio facilities for vital public safety functions by public agencies including the County of Hawaii Police and Fire Departments as well as State and Federal agencies for the safety and welfare of the community.

5.1 NO ACTION ALTERNATIVE

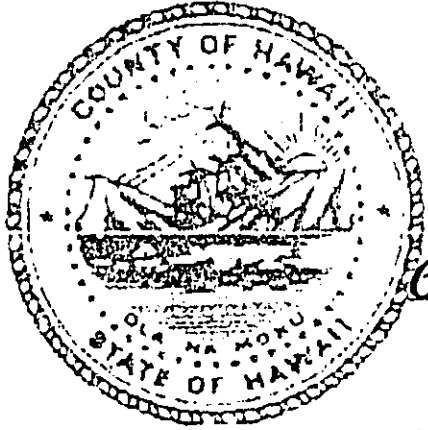
Under the No Action alternative, the County of Hawaii would not replace its current emergency radio facilities. This alternative would limit public safety radio users to the use of the existing communication facilities which have a questionable amount of service lifetime remaining. An assessment of the full system in 1995 (Schema Systems) addressed the deficiencies of many of the facilities and recommended the necessary upgrades for continued efficiency. With no action, the FCC requirement to convert the public safety frequencies from the present 2 GHz analog microwave system to a 6 GHz digital microwave would not be accomplished and the County would not be in federal compliance. Further, with no action, the Police and Fire Departments and other public agency users would have to rely on dated systems for radio transmission. Continued use for an indefinite period of time of the current system would not be in the public interest and could potentially compromise public safety.

The "No Action" alternative, therefore, does not meet the County's basic operational requirements for handling emergencies to protect the public interest and welfare.

5.2 OTHER SITES

The County's existing emergency radio system is designed as a looped system covering all regions and districts of the island. A prerequisite for microwave technology is line-of-sight transmission to provide an unobstructed path for signals between the transmitting facilities. In preparation for the design of the upgraded system, a microwave path survey (Harris Communications 2003) was conducted at each of the existing facilities and all locations were found to be satisfactory provided that tower heights are raised at 13 of the 19 locations. The increases in height are necessary to accommodate growth in vegetation and intervening developments between facilities over the past 30 years since the original installation of the existing system. The path survey validated that selection of other sites would not be necessary for successful microwave transmission.

This conclusion avoids the need for environmental disturbance at other locations to construct new access roads, grading of undisturbed lands, and for installation of electrical power to serve the sites.



6. RELATIONSHIP TO PLANS, POLICIES,
AND CONTROLS

6.0 RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

The Project's conformance to County, State, and Federal permitting and review requirements have been fully described in Section 3. Other relevant County of Hawaii and State of Hawaii laws, ordinances, and policies are described below.

6.1 STATE OF HAWAII

6.1.1 Hawaii State Land Use Law

Chapter 205, HRS, establishes the State Land Use Commission (LUC) and authorizes this body to designate all land in the state into four land use districts: Urban, Rural, Agricultural, or Conservation.

The 19 sites are in three land use districts: Urban (8 sites), Agricultural (7 sites), Conservation (4 sites). The facilities in the Urban district will require County Plan Approval; the facilities in the Agricultural district will require County Special Permits. The four Conservation district sites require a State Board of Land and Natural Resource Conservation District Use Permit (CDUP). These are summarized in Table 9.

Table 9. State Land Use Districts and Permit Requirements

State Land Use District	Radio Facility Sites	Permit Requirement
Urban	Captain Cook Police Station Fire Central Hamakua Police Station Hilo County Baseyard (Refurbish) Kamehameha Park Public Safety Building (Refurbish) Puna Police Station Waimea Police Station (Refurbish)	County Plan Approval
Agricultural	Huehue Ranch (Refurbish) Kau Police Station	
Agricultural	Huehue Ranch (Refurbish) (Special Permit received) Iolehaehae Kahua Ranch Kau Police Station (Special Permit received) Naalehu Pasture Ohia Mill South Point	County Special Permit
Conservation	Kailua Police Station Kauna Point (Refurbish) Kulani Cone Moanuaiahea	State Conservation District Permit

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6.1.2 Hawaii State Plan, Chapter 226, Hawaii Revised Statutes

The Hawaii State Plan establishes the overall themes, goals, objectives and policies to guide the long-range growth and development of the State. The upgrading of the County's emergency radio facilities is consistent with the following State Plan objectives and policies:

Section 226-6 Objectives and policies for the economy – in general.

(b) (6) Strive to achieve a level of construction activity responsive to, and consistent with State growth objectives.

Section 226-10.5 Objectives and policies for the economy – information industry.

(b) (1) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawaii to accommodate future growth in the information industry.

Section 226-11 Objectives and policies for the physical environment – land-based, shoreline, and marine resources.

(b) (3) Take into account the physical attributes of areas when planning and designing activities and facilities.

Section 226-14 Objectives and policies for facility systems – general.

(b) (1) Accommodate the needs of Hawaii's people through the coordination of facility systems and capital improvement priorities in consonance with the State and County Plans.

Discussion: The upgrading of the County emergency radio facilities will involve construction (or refurbishing) of facilities at 19 islandwide locations and will increase the level of construction activity in the County of Hawaii during the period of construction.

The County's radio system has been planned to be jointly used by Federal, State, and County public agencies to provide vital communications. Through co-location, the County's system will be maximized and will accommodate the information and communications needs of other agencies which also perform public duties. The upgrading of the system will enhance the voice communication and data transmission capabilities of public agencies to provide information to all areas of the public sector. The facility is designed to accommodate the future needs of the public agencies.

Seven of the 19 site locations are within clusters of other communications facilities. These sites are at Huehue Ranch, Iolehaehae, Kahua Ranch, Kulani Cone, Moanuahea, Naalehu Pasture, and South Point. This is consistent with the State Plan objectives to coordinate facility systems and capital improvements in consonance with the State and County Plans.

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6.2 COUNTY OF HAWAII

Planning in Hawaii County is conducted in a three-tier system. The first tier is the General Plan, a long-range plan containing goals, policies, standards and courses of action for the island. The General Plan forms the legal foundation of other elements in the County's planning system.

The second tier of the County planning system includes short- and mid-range plans related to specific geographic regions, functions and special areas within a region. The third tier includes zoning and subdivision codes and other specific mechanisms intended to implement the first and second tier.

Table 10 summarizes the State and County land use designations:

Table 10. Site Summary of State Land Use, County General Plan, and County Zoning Designations

Site	State Land Use	General Plan	County Zoning	Permit Requirement
Capt. Cook Police Station	Urban	High Density / Urban	A-1a	Plan Approval
Fire Central	Urban	High Density / Urban	CG-7.5	Plan Approval
Hamakua Police Station	Urban	Medium Density	RS-7.5	Plan Approval
Hilo County Baseyard	Urban	High Density / Urban	MG-1a	Plan Approval
Huehue Ranch	Agricultural	Extensive Agriculture	A-5a	Plan Approval
Iolehaehae	Agricultural	Extensive Agriculture	A-40a	Special Permit
Kahua Ranch (Construction by State / DAGS)	Agricultural	Intensive Agriculture	A-20a	Special Permit
Kailua Police Station	Conservation	High Density / Urban	Open	CDUA
Kamehameha Park	Urban	Low Density	RS-15	Plan Approval
Kau Police Station	Agricultural	---	A-20a	Plan Approval
Kau State Bldg (Demolition Only)	Urban	---	CV-10	Plan Approval
Kauna Pt. (Kaiakēkua)	Conservation	Conservation	Open	CDUA
Kulani Cone	Conservation	Open	Not zoned	CDUA
Moanuaiahea	Conservation	Extensive Agriculture	---	CDUA
Naalehu Pasture	Agricultural	Extensive Agriculture	A-20a	Special Permit
Ohia Mill	Agricultural	Orchard	A-5a	Special Permit
Public Safety Building	Urban	High Density / Urban	RM-1	Plan Approval
Puna Police Station	Urban	High Density / Urban	CV-10 / RS-15	Plan Approval
South Point	Agricultural	Extensive Agriculture	---	Special Permit
Waimea Police Station	Urban	Medium Density	A-40a	Plan Approval

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6.2.1 County of Hawaii General Plan

The County of Hawaii General Plan is a policy document for the long-range comprehensive development of the island of Hawaii and also provides the direction for future growth of the County through stated development standards and principles for the most desirable use of land within the County.

Initially adopted by County ordinance on December 15, 1971, the current General Plan was adopted as Ordinance 439 in November 1989 and is presently undergoing revision by the Planning Department. The latest version of the General Plan Revision (Draft) is December 21, 2001

As the most fundamental document in Hawaii County's planning system, the General Plan includes a comprehensive review program that investigates and analyzes all aspects of the County under a standard methodology. Applicable goals, policies and standards from Section 4 of the General Plan include the following:

1. *Public Facilities*

Goal: Encourage the provision of public facilities that effectively service community needs and seek ways of improving public service through better and more functional facilities which are in keeping with the environmental and aesthetic concerns of the community.

Protective Services – Standards

Development of police and fire facilities should entail joint use structures whenever feasible.

Section 5 of the General Plan describes the courses of action to promote the policies, development objectives, standards and principles for the County's judicial districts for the following:

- (4) *Public Facilities*
- (b) *Protective Services*
Service facilities shall be improved to meet needs.
- (c) *Government Operations*
Expand/improve facilities as necessary

Discussion: The upgrading of the County's radio facilities will install a modern high capacity digital interconnect to replace the present analog radio channels used by the Police and other County agencies. The upgrading of the backbone of the system will have the capability necessary for the conversion to a digital system to handle the expanding requirements of the public safety community. The conversion to high capacity digital microwave was also forced both by the Federally-mandated reassignment of analog microwave frequencies to personal communications systems (cellular telephones) and public safety agencies growing need for communications services to properly serve the public in the coming years. These improvements will be consistent with the Public Facilities goals and policies and with the Protective Services Standards of the General Plan.

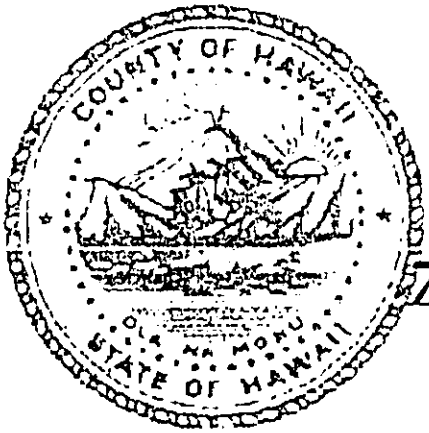
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6.2.2 County of Hawaii Zoning

The County of Hawaii zoning designation for the 19 site locations is summarized in Table 10 above. The Urban sites will require County Plan Approval and the Agricultural sites will require Special Permit approval by the Planning Commission.

6.2.3 County of Hawaii Special Management Area

The Coastal Zone Management Act (CZMA) contains the general objectives and policies upon which all counties within the State have structured specific legislation which created Special Management Areas (SMA). Any development within the Special Management Area boundary requires a SMA Use Permit which is administered by the County of Hawaii. None of the 19 facilities is located on lands in the SMA.



7. ANTICIPATED DETERMINATION

7.0 DETERMINATION, FINDINGS, AND REASONS FOR SUPPORTING DETERMINATION

To determine whether the proposed action may have a significant impact on the environment, every phase and expected consequences, both primary and secondary, and the cumulative as well as short- and long-term effects have been evaluated. Based on the studies performed and research evaluated, a finding of no significant impact is anticipated as summarized in this section.

7.1 SIGNIFICANCE CRITERIA

According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects, and its short and long-term effects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant environmental impact will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

- (1) **Involves an irrevocable commitment to loss or destruction of any natural or cultural resources;**

The County's 19 emergency radio facilities are distributed islandwide in various environments in three land use districts (Urban, Agricultural, and Conservation); thus the natural and cultural resources of the surrounding environs vary greatly. However, in all cases, the actual footprint of each site is limited, averaging approximately 900 – 1,000 square feet in size. In addition, each site is a developed site and has been previously graded to accommodate the existing radio facilities. All sites have been assessed for natural and cultural resources and findings confirm that the construction of replacement or refurbished facilities will not involve an irrevocable commitment or loss of natural or cultural resources.

- (2) **Curtails the range of beneficial uses of the environment;**

The Urban sites are attached to public agency properties (e.g. police or fire stations, baseyard, park). The facilities include an antenna tower, radio/generator equipment shelter (150 sq ft), and aboveground fuel storage tank). These facilities are tucked into the overall site and occupy only approximately 900 – 1,500 square feet of area, thus allowing pre-existing beneficial uses to continue.

The rural sites (i.e., Agricultural and Conservation) are generally in open spaces - pastureland, open fields – and occupy only a small portion of the overall property allowing all other functions to continue. Thus the project will not curtail the range of beneficial uses of the environment.

- (3) **Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders;**

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The proposed project will not conflict with the environmental policies set forth in the State Plan and Chapter 344, *Hawaii Revised Statutes* and will provide a much needed upgraded infrastructure for vital public safety and emergency communications.

(4) Substantially affects the economic or social welfare of the community or state;

The radio system is a public facility to be used by public agencies for public purposes. The system is an integral part of the infrastructure needed to maintain the health and welfare of the Hawaii County community.

In addition, the construction will generate new sources of direct and indirect revenue for individuals, the County of Hawaii, and the State of Hawaii, by providing construction employment opportunities. Indirect employment in a wide range of service-related industries will also be created from construction and the provision of services during project development.

Conversely, not implementing the upgrades to the 30-year old system would soon compromise public safety as the system continues to age, and thus adversely affect the social welfare of the community.

(5) Substantially affects public health;

As an emergency communication system, the project will have a significant long-term benefit to the community's public health. Any short-term impacts on air and noise quality levels are not anticipated to be significant and will not generate pollutants that would impact the surrounding uses.

The microwave technology depends on line of sight transmission, requiring antennas to be mounted high on the towers, thus the system as a whole and each individual facility is not expected to produce an EMR hazard to people or animals on the ground or in areas beyond the site fence. There will not be an adverse effect on public health.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities;

The upgrading of the emergency radio facilities will not cause population changes, nor will it tax public facilities. The facilities are unmanned and will be maintained by contract personnel who are likely residents in the County.

The project will not induce future development or population changes, nor attract visitors or new residents, nor generate any significant new long-term employment opportunities. The demands on roads will be temporary during the short construction period at each site is anticipated to be approximately 3 – 4 months per site.

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(7) Involves a substantial degradation of environmental quality;

The proposed development will utilize small areas of already graded land and is not expected to degrade environmental quality on-site or in the surrounding neighborhoods. Short-term impacts to air, noise and traffic, however this will occur over a limited construction period of 3-4 months. Appropriate best management practices will provide safeguards for protection of water quality during the short-term construction period.

Field investigations for botanical and wildlife resources, as well as archaeological resources, indicated a minimal to no effect conclusion, given the already developed condition at each site.

(8) Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;

This environmental assessment is prepared to assess the effect of each radio facility individually and the total system cumulatively. As a linked system that operates in a loop, each facility is vital to the communications needs of the Hawaii Police Department and all other user agencies. Thus, the total effect of the County emergency radio system on the environment is described in this EA.

(9) Substantially affects a rare, threatened or endangered species or its habitat;

Site investigations for rare, threatened, and endangered plants and animals were conducted. All sites have been disturbed previously – by urban development or graded for the currently standing facilities on the agricultural and conservation lands. None of the improvements are on undisturbed lands, thus the Botanical survey indicated only a few common native species among predominantly naturalized exotic species.

With regard to wildlife, the USFWS has indicated their concern for potential impacts of tower structures on the threatened Newell's shearwater and the endangered Hawaiian dark-rumped petrel. The wildlife survey indicated the need for further coordination with the USFWS to survey the area at four sites (Iolehaehae, Kamehameha Park, Kauna Point, Kulani Cone). The County of Hawaii is in the process of finalizing radar ornithology and auditory surveys at the prospective sites to better determine the potential effect of the existing and new tower structures on seabirds. Preliminary results are described in Section 4 and appendix B-1 and B-2.

(10) Detrimentially affects air or water quality or ambient noise levels;

The proposed project will not include any significant sources of air emissions or noise levels that would violate existing Federal or State standards. Minimal impacts on air quality and noise are anticipated during construction, but will be limited by normal construction practices (i.e., mufflers, water wagons, construction during daylight hours only, etc.). Best Management Practices (BMPs) will be implemented for environmental protection as applicable.

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- (11) **Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters.**

None of the radio sites is in a flood-plain or other water-based area, erosion-prone area, or coastal area. A number of the sites, however, are in geologically hazardous areas and one site is in the tsunami zone. The facilities are designed to County standards for environmentally sensitive areas.

- (12) **Substantially affects scenic vistas and view planes identified in county or state plans or studies;**

The *General Plan* of the County of Hawaii establishes goals to maintain the natural beauty of the island by protecting scenic vistas and view planes from becoming obstructed. The County's radio facilities occupy 19 locations in urbanized and rural areas and no new site locations are proposed. These facilities in the rural Conservation and Agricultural districts are generally remote and clustered with other telecommunications facilities. This is consistent with the intent of the *General Plan*.

- (13) **Requires substantial energy consumption.**

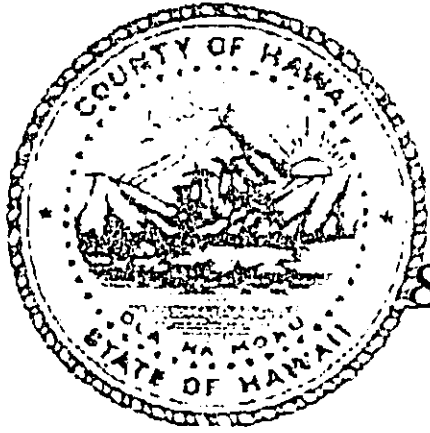
The construction and operation of the project will not require substantial energy consumption.

- Two sites are solar powered.
- Seven sites will receive new 200 amps (A) service from HELCO.
- Three sites will receive new 100A connections from existing sources, or HELCO.
- Five sites will use existing power from 1-2 20A breakers from the existing distribution panels within the buildings.

7.2 DETERMINATION

In accordance with Chapter 343, Hawaii Revised Statutes, this Environmental Assessment has examined the environmental and technical aspects of the proposed project. In considering the significance of potential environmental effects, the sum of effects on the quality of the environment was considered and the overall and cumulative effects of the action were evaluated. Every phase of the proposed action, the expected consequences, both primary and secondary, and the cumulative as well as the short- and long-term effects of the action were considered.

As result of these considerations, it is determined that the proposed action will not significantly impact the environment, based on the significance criteria listed in 11-200-12 of the Environmental Impact Statement Rules and addressed below. Therefore, a "Finding of No Significant Impact" (FONSI) has been determined for this project.



8. CONSULTED PARTIES

8.0 CONSULTED PARTIES

Consultation was initiated pursuant to DOH EIS Rules Section 11-200-15 for the preparation of the Draft EA with County, State, and Federal agencies through written letters requesting comments and through community informational and scoping meetings.

8.1 LETTERS REQUESTING CONSULTATION

Letters requesting consultation for the preparation of the Draft EA were sent on April 7, 2003 to the County, State, and Federal agencies. Asterisks (*) indicate responses received; these letters are attached in this section.

County of Hawaii Agencies

Department of Public Works
Department of Parks and Recreation *
County Council

State of Hawaii Agencies

Office of Environmental Quality Control *
Department of Accounting and General Services*
DLNR*
DLNR – SHPD
Department of Agriculture
Department of Business, Economic Development and Tourism – Planning Office
DBEDT – Energy, Resources and Technology Division
Department of Defense
Department of Hawaiian Home Lands
Department of Transportation*
Office of Hawaiian Affairs

Federal Agencies

US Fish and Wildlife Service
US National Park Service
US Department of the Army - Army Engineer Division *
US Department of Transportation - Federal Aviation Administration
US EPA – Pacific Islands Contact Office
US Department of Transportation – United States Coast Guard

Organizations

HELCO – Engineering Department
Kamehameha Schools Bishop Estate – Land Manager

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8.2 COMMUNITY MEETINGS

Informational community meetings on the planned upgrading of the emergency radio facilities were conducted by the Police Department and the County's consultant, Martin Pacific Property Services, at six County of Hawaii districts between May 1 through 13, 2003. The meetings were held at Kailua Kona, Hilo, Hamakua, Kamehameha Park in Kapaau, Naalehu, and Waimea.

Comments from participants include the following questions, statements, and concerns:

- Recommendation that the County rent space on the towers to create additional revenue for the County. [County response: Co-location would be with other public agencies; cost requirements would be limited to shared maintenance and improvements of the towers.]
- Question if the towers be used by commercial companies. [County response: There are no plans at this time for co-location by commercial companies.]

[Note of Further Clarification: In further assessing this issue, the County has determined that co-location with commercial companies would minimize environmental effects by reducing the number of towers rather than duplicating tower structures at some locations. Thus the County will further review the opportunities for future co-location with other agencies and commercial companies.]

- Recommendation that the facilities be designed for Category 4 hurricanes. Concern that the towers are only designed to withstand 110 miles per hour sustained winds.
- Complaint that the TDD system is inadequate. Would the system improve 911? [County response: The system would improve 911 calls.]
- Concern about health effects of electromagnetic radio (EMR) emissions and a concern that there is an increased proliferation of EMR in the USA. Request that the County reduce radio frequency emissions.
- How were tower heights determined? [Response: A technical Path Study for the line of sight system was performed that set the tower heights.]
- Objections to the continuous tax increases for police radio upgrades.
- Life span of the towers and shelters. [County response: 20 years]
- Question about the maintenance of the system. [County response: The County's Agreement with the Contractor (Scientel America, Inc.) includes a 2-year maintenance program to be implemented by Pacific Wireless Communication.]