ALAN M. ARAKAWA
Mayor

WILLIAM R. SPENCE
Director

MICHELE CHOUTEAU McLEAN
Deputy Director

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OFFICE OF THE MAYOR

COUNTY OF MAUI
DEPARTMENT OF PLANNING
February 23, 2017

RECEIVED
2017 FEB 28 AM 9:34
OFFICE OF THE COUNTY CLERK

Honorable Alan M. Arakawa
Mayor, County of Maui
200 South High Street
Wailuku, Hawaii 96793

For Transmittal to:

APPROVED FOR TRANSMITTAL
2/27/17
Mayor Date

Honorable Mike White, Chair
and Members of the Maui County Council
200 South High Street
Wailuku, Hawaii 96793

Dear Chair White and Members:

SUBJECT: MAUI COUNTY REPETITIVE LOSS PROPERTIES FLOODPLAIN MANAGEMENT PLAN ANNUAL STATUS REPORT (2016)

Pursuant to Resolution No. 01-141, the Department of Planning (Department) is required to provide annual status reports to the County Council on the implementation of the Floodplain Management Plan. The Department therefore transmits the following documents for your information:

1. Resolution No. 01-141, entitled, "ADOPTING THE COUNTY OF MAUI REPETITITVE LOSS PROPERTIES FLOODPLAIN MANAGEMENT PLAN," with attached Exhibit "A" (County of Maui, Repetitive Loss Properties Floodplain Management Plan);

2. County of Maui, Repetitive Loss Properties Floodplain Management Plan-Updated 2016; and

3. County of Maui, Repetitive Loss Properties Floodplain Management Plan, Annual Evaluation Report, September 2016.

Thank you for your attention to this matter. Should further clarification be necessary, please contact Carolyn Cortez at Carolyn.Cortez@mauicounty.gov or Ext. 7813.

Sincerely,

WILLIAM SPENCE
Planning Director

Attachments
xc: John Rapacz, Planning Program Administrator
Carolyn Cortez, Staff Planner
WRS:JSR:CEC
14/General File
S:\ALL\NATIONALFLOODINSPROGRAM\ANNUALEVALUATIONREP

COUNTY COMMUNICATION NO. 17-105

Resolution

No. 01-141

ADOPTING THE COUNTY OF MAUI REPETITIVE LOSS PROPERTIES FLOODPLAIN MANAGEMENT PLAN

WHEREAS, the National Flood Insurance Program provides federally backed flood insurance to communities that adopt and enforce a floodplain management ordinance to regulate development in flood hazard areas; and

WHEREAS, failure to participate in the National Flood Insurance Program would result in the denial of federal financial assistance for acquisition and construction purposes, and jeopardize the making, securing, extension, and renewal of loans secured by improved real estate by lending institutions regulated by the federal government; and

WHEREAS, in 1981, the County of Maui enacted a floodplain management ordinance, codified as Chapter 19.62, Flood Hazard Areas, Maui County Code, to qualify for federal flood insurance; and

WHEREAS, the National Flood Insurance Program rewards communities that are doing more than meeting the minimum flood requirements to help their citizens prevent or reduce flood losses through the Community Rating System program; and

WHEREAS, the County of Maui has participated in the National Flood Insurance Program Community Rating System since

1996 and has a current rating of Class 8, which provides an annual savings of approximately $300, 000 to property owners with flood insurance; and

WHEREAS, the County of Maui has been identified by the Federal Emergency Management Agency (FEMA) as a Category C Repetitive Loss Community; and

WHEREAS, a Category C Repetitive Loss Community is one that has ten or more repetitive loss properties; and

WHEREAS, a repetitive loss property is one for which two or more claims of $1,000 or more have been paid by the National Flood Insurance Program within any given ten-year period since 1978; and

WHEREAS, the County of Maui has, to date, 11 such repetitive loss properties; and

WHEREAS, as a participant of the Community Rating System, and pursuant to the National Flood Insurance Program Community Rating System Manual, Federal Emergency Management Agency publication FIA-15, dated January 1999, the County of Maui is required to adopt a flood plain management plan for its repetitive loss areas; and

WHEREAS, failure to adopt a floodplain management plan will result in the loss of the County's Class 8 Community

Rating System rating and the $300,000 insurance premium savings; and

WHEREAS, a County of Maui Repetitive Loss Properties Floodplain Management Plan ("Floodplain Management Plan") has been developed by the Planning Department to address the flooding hazards affecting the repetitive loss areas, which Plan is attached hereto as Exhibit "A" and made a part hereof; and

WHEREAS, the Floodplain Management Plan was developed in accordance with the ten-step procedure set forth in Section 511 of the National Flood Insurance Program Community Rating System Manual; and

WHEREAS, the Floodplain Management Plan recommends various activities to prevent the repetitive flooding problem from getting worse and assist property owners in protecting their properties; and

WHEREAS, a public meeting was held on the draft Floodplain Management Plan on June 22, 2001; and

WHEREAS, Section 46-11, Hawaii Revised Statutes, vests the mayor and the council of the various counties, in regard to the respective counties, with the functions, powers, and duties that are necessary to enable their respective

counties to qualify, participate, and apply for federal flood insurance coverage; now, therefore,

BE IT RESOLVED by the Council of the County of Maui:

1. That, pursuant to Section 46-11, Hawaii Revised Statutes, and in accordance with the requirements of the National Flood Insurance Program Community Rating System, it hereby adopts the Floodplain Management Plan; and

2. That, in accordance with Section 10 of the Floodplain Management Plan, the Director of Planning provide annual status reports on the implementation of the Floodplain Management Plan to the Council of the County of Maui; and

3. That the County Clerk provide certified copies of this Resolution to the Mayor and the Director of Planning.

APPROVED AS TO FORM AND LEGALITY

BRIAN MOTO
Deputy Corporation Counsel
County of Maui
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COUNTY OF MAUI
REPETITIVE LOSS PROPERTIES
FLOODPLAIN MANAGEMENT PLAN

1. Introduction

Maui County has been identified by the Federal Emergency Management Agency (FEMA) as a Category C Repetitive Loss Community. A Category C Repetitive Loss Community has ten or more repetitive loss properties. A repetitive loss property is one for which two or more claims of $1,000 or more have been paid by the National Flood Insurance Program (NFIP) within any given ten year period since 1978. The County has 11 repetitive loss properties.

The County has participated in the NFIP since 1981. In 1996, the County enrolled in the NFIP's Community Rating System (CRS) where flood insurance premiums are reduced when communities implement more than the minimum regulatory requirements. The County has a Class 8 rating with a current annual flood insurance premium savings of approximately $300, 000. When a community has ten or more repetitive loss properties, the County is required to adopt a floodplain management plan to more effectively manage the community's floodplain areas.

2. Background

The County of Maui consists of the islands of Maui, Lanai, Molokai and Kaho'olawe and includes a land area of approximately 1,100 square miles and coastline of approximately 250 miles. The Island of Maui has over 140 miles of tidal coastline.

All of the repetitive loss properties are on the south and west shores of the Island of Maui.

3. Hazard Assessment

The repetitive loss properties are subject to either riverine or coastal influenced flooding. Riverine flooding is the result of the storm runoff generated inland and flowing into floodplain lands. Coastal flooding may be the result of an earthquake or high surf and storm surges from large-scale weather systems. Coastal flooding has most recently been related to hurricanes and kona storms. The FEMA's flood insurance rate maps (FIRM) designates the 100 year flood inundation limits along the

EXHIBIT "A"

major streams and coastal areas.

4. Problem Assessment

There are nine repetitive loss properties on the west coast of Lahaina and two repetitive loss properties on the south coast of Kihei. The Lahaina properties have both riverine and coastal influenced flooding, while the Kihei properties have only riverine or inland flooding. Coastal flooding on the western coast of Maui ranges from 7 to 17 feet above mean sea level. The repetitive loss properties that were in the same vicinity were grouped into one of the following repetitive loss areas:

Area #1- Panel 0138B, Napili, Maui

Two properties located on a rocky point on the Napili coast are partially within the Special Flood Hazard Areas V24, an area of coastal flooding with velocity. The dwellings on the properties are pre-FIRM (1980) structures subject to coastal flooding up to a base flood elevation of 17' mean sea level (msl). Both dwellings are of two story construction with the bottom floors partially or wholly below the base flood elevation.

Area #2 - Panel 0151C, Kahana, Maui

The subject property is located within the Kaopala Gulch floodway and subject to flooding from 21' to 30' msl, with a flow velocity of approximately 5.7 feet per second. The existing pre-FIRM (1949) structures are located at approximately 19' msl. Other structures in the vicinity are located within the Kaopala Gulch floodway and subject to flooding.

Area #3 - Panel 0151B, Mahinahina, Maui

The flooding of two apartment units at The Kuleana apartment complex were caused by a grated drain inlet blocked by debris. The entrances to the two units are located in a depressed sideyard with an 8" drain. When the parking lot's drain inlet, located near the top of the concrete walkway leading to the units became blocked with debris, the runoff water flowed into these two units. The 8" area drain was not sufficient to handle the additional flow. A new grate inlet was install in 2001 to improve the inlet's efficiency. In addition, the apartment manager stated that the drains are regularly maintained to

prevent clogging. This project is within the Special Flood Hazard Area C, an area of minimal flooding.

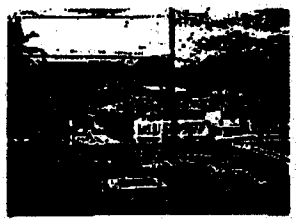
Area #4- Panel 0153C, Kaanapali, Maui

The subject property is located within the Kaanapali Resort area whose coastline is approximately 2.6 miles long. The Kaanapali Resort area is subject to coastal flooding with runup elevations up to 8' msl. The Whaler on Kaanapali Beach is a condominium consisting of Pre-FIRM 1974 structures located on a lot of approximately 6.6 acres. All of the structures are located within the Special Flood Hazard Area zone C, an area of minimal flooding. The current staff has no recollection of the flood damages occurring in the years of 1980, 1992 and 1993. Portions of two of the main structures are located adjacent to the limits of the coastal flood plain and may be subject to coastal flooding. In addition, parking and operational offices are located in a basement level below the base flood elevation which maybe flooded in the event flooding exceeds the 100 year coastal base flood elevation.

Area # 5 - Panel 0163B, Lahaina, Maui

The entire property is within the Special Flood Hazard Area A4. The Pre-FIRM structure on the property is located approximately 30 feet from the shoreline and subject to coastal flooding up to elevation 8' msl. The structure appears to be below the base flood elevation.

Area #6 - Panel 0163B; Wainee, Lahaina, Maui



The three repetitive loss properties noted on this panel are within the Special Flood Hazard Area C, an area of minimal flooding. The properties are located upstream and adjacent to an existing rock lined ditch connected to an 18" culvert. These three lots are unique for the in that the existing structures on the properties were built on slab-on-grade and constructed below the pavement grade of Wainee Street. Flooding of the properties occurs when the offsite storm runoff exceeds the capacity of the storm drainage system and backs up into the properties. The majority of the offsite runoff is from agricultural lands above the subject properties.

Area #7 - Panel 0265C, Kihei, Maui

The subject property is located within the Kihei flood plain which is approximately 4 miles long and 3/4 miles wide. Keokea Stream drains into the Kihei flood plain. Flooding is attributed to the limited capacity of the stream outlet channel and to sand dunes blocking the surface drainage to the ocean at various beach access. The subject dwelling's first floor elevation appears to be slightly above the road shoulder grade. The first floor of the existing Pre-FIRM two story dwelling floods until the sand dune at the beach access is manually or naturally breached. The owner indicated that approximately 4" of flood waters has inundated the dwelling. This property is within the Special Flood Hazard Area AH with a base flood elevation of 7'msl. A new storm drain system (3'x8' box culvert) for the area was installed in 2000 with a grate inlet approximately 50' from the subject property. Similar to other drain outlets, the sand berm at the outlet structure needs to be cleared before the drain becomes operational.

Area #8 - Panel 0265C, Waiohulu Development Subdivision, Kihei, Maui

Flooding of property located at 135 Akai Street is confined to the subject property. The flooding was caused by inadequate drainage for a carport that was converted into a habitable room. A large existing concrete covered patio adjacent to the enclosed carport contributed to the flooding of the new living area. The owner has installed three drywells to assist in the drainage of storm runoff. The owner stated that they have not experienced any flooding since the installation of the drywells over three years ago.

5. Public Involvement

All of the owners of repetitive loss properties or their representatives were contacted by phone. The County conducted onsite interviews of the six owners/representatives for input on the their flooding and flood proofing measures. Phone interviews were also done with one owner. The other property owners did not return our phone inquiries. In addition, a public meeting was held on June 22, 2001 to solicit comments on the draft floodplain management plan. No one spoke at the public meeting. Finally, copies of the plan were sent to each property owner for review and comment. One property owner responded in writing and another by phone.

6. Coordination

A meeting was held with members of the Department of Public Works and Waste Management, Maui County Civil Defense and Planning Department to determine the goals, possible activities and action plan. The draft plan was sent to the State floodplain coordinator and Insurance Service Offices, Inc., for their review and comments.

7. Goals

a. Protect the homes and buildings in the repetitive loss areas;
b. Develop a flood warning system for flash flooding.

8. Review of Possible Activities

This section is to evaluate possible measures to address the flood problems affecting the repetitive loss properties. In summary we have eleven repetitive loss properties located within eight repetitive loss areas on Maui as described above. The eight areas can be further categorized into following:

Coastal flooding: areas nos. 1, 4 and 5.
Riverine flooding: areas nos. 2, 6, 7,
On site flooding: areas 3, 8

For each of the categories, proposed activities such as preventive, property protection, emergency services, structural projects, and public information were evaluated and summarized as follows:

Preventive: Preventive activities keep flood problems from getting worse. The use and development of flood prone areas is limited through planning, land acquisition, or regulation. They are administered by rules and regulations governing land use, open space preservation, floodplain regulations, storm water management, drainage system maintenance and dune/beach management.

Coastal flooding: areas nos. 1, 4 and 5.

All the structures in these areas were constructed before the current floodplain regulations were in effect, and are considered as existing nonconforming structures. The current floodplain regulation allows construction, i.e. additions, renovations and alterations to the current structures without any compliance to the floodplain regulation provided the cost of construction is not more than fifty percent of the value of the existing structure. If the construction costs exceeds the fifty percent criteria, the entire structure will be required to comply to the current standards. The proposed preventive action will be to reduce the construction threshold of fifty percent to ten percent over a five year period before compliance to the current floodplain standards for new construction is required.

Riverine flooding: areas nos. 2, 6 and 7

Preventive activities included maintenance of the respective drainage systems at a minimum interval of one year. In addition, the County's standard operating procedure (SOP) to address potential flooding. The SOP included cleaning or opening of all critical storm drain/channel outlets and to have staff on alert for possible drainage problems when general flooding conditions occur.

On site flooding: areas nos. 3 and 8

Preventive activities included maintenance by the owners of the respective drainage systems at a minimum interval of one year.

Property protection: Property protection activities are usually undertaken by property owners on a building-by-building or parcel-by-parcel basis such as relocation, acquisition, building elevation, flood proofing, sewer backup protection and flood insurance.

Coastal flooding: areas nos. 1, 4 and 5.
Riverine flooding: areas nos. 2, 6 and 7
On site flooding: areas nos. 3 and 8

Relocation and acquisition were discussed but deemed too costly. Elevation and flood proofing activities were favored as being more practical. More than half of the properties do not have flood insurance and would not be covered for future flood damages. The property owners should be encouraged to obtain flood insurance. Repetitive loss property owners can also benefit from NFIP 's Increased Cost of Compliance program.

Emergency services: Emergency service activities are taken before and during a flood to minimize its impact. These measures are the responsibility of the County's Civil Defense Agency.

Coastal flooding: areas nos. 1, 4 and 5.
Riverine flooding: areas nos. 2, 6 and 7
On site flooding: areas nos. 3 and 8

For tsunami warnings (coastal flooding), over 50 sirens are utilized as part of the warning system. The siren system is activated using Police radio frequencies. In the near future, the system will be converting from the Police VHF to the Police 800MHz radio system. Since flash flooding for specific areas are difficult to predict, up to date information of storm activities is essential for the public protection. Weather information can be obtained through National Oceanic Atmospheric Administration (NOAA) radio, the internet, radio and television stations. The more sophisticated NOAA weather radios incorporates a weather alert feature which provides an alert sound notification for severe weather situations. Also, the property owners will need

to be aware of local flooding conditions and to remain alert and vigilant during heavy rains and possible flash flooding situations.

Structural projects: Structural projects keep flood waters away from an area with a levee, reservoir, or other flood control measures, i.e., flood walls, diversions, channel modifications, beach nourishments, storm sewers, etc.

Coastal Flooding: areas nos. 1, 4 and 5.

Flood walls where adverse impacts to the adjacent areas are minimized are encouraged.

Riverine flooding: areas nos. 2, 6, 7,

Area no.2: The road culvert on the Lower Honoapiilani Road could be upgraded to increase its flood carrying capacity. A desilting basin was installed in year 1998 above the subject area reducing the peak storm for this area.

Area no. 6. The projected 10 year Lahaina Watershed Project diverting the storm flows from above Lahaina to the unnamed gulch adjacent to Launiupoko Beach Park has started. The consultant contract for the preparation of the environmental assessment and obtaining the required permits is currently being negotiated. The engineering design for the first phase of the project which includes the outlet to Kauaula Stream is being done by the National Resource and Conservation Service fka Soil Conservation Service of the Federal Department of Agriculture. It is anticipated that construction bids for the project will be requested in the year 2002. The Lahaina Drainage System Master Plan was not considered since current funding has not been available. A repetitive loss property owner's suggestion that the upstream culvert crossings on Honoapiilani Highway be closed or modified was discussed, but determined to not be feasible due to its ramifications on the vehicular traffic on the highway.

Area no. 7. A new storm drainage system was installed during the year 2000. The system has improved the drainage of the area.

Public information: Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural beneficial functions of local floodplains. i.e. map information, outreach projects, real estate disclosures, technical assistance, library, etc.

Coastal Flooding: areas nos. 1, 4 and 5.
Riverine flooding: areas nos. 2, 6, 7,

On site flooding: areas 3, 8

All property owners would be better informed with the detail flooding affecting their respective properties and with technical bulletins and publications for elevating and flood proofing of their homes. The "Increased Cost of Compliance" and flood insurance programs should also be provided to homeowners.

9. Action Plan

a. Floodplain Regulations: The County will amend its floodplain regulations to reduce the construction permitted before full compliance with flood standards is required. The current regulations allow the cost of construction to fifty percent of the existing value of the structure before compliance is required. The proposal is to change the threshold to ten percent over a five year period. The ordinance will be drafted for agencies' review by October 1, 2001. The ordinance should be transmitted to the County Council for adoption by December 1, 2001.

b. Flood Maintenance: Maintenance of the area drainage systems by the County or respective property owners will be done. The County will record its maintenance activities. The property owners with private systems will be inspected on an annual basis prior to the hurricane season (June to November).

c. Property protection: Repetitive loss property owners will be informed on the benefits of flood insurance, floodproofing and elevating nonconforming structures. The County will transmit copies of respective FEMA publications to the repetitive loss property owners.

d. Emergency services: To improve the effectiveness of the 50 sirens for tsunami warnings (coastal flooding) , the County is converting to 800mhz sirens. Since flash flooding for specific areas are difficult to predict, up-to-date information of storm activities is essential for the public's protection. Information will be disbursed on the National Oceanic Atmospheric Administration (NOAA) radio and auto alert (costing less than $80) to inform owners of pending flooding for the area. Also, the property owners will be informed of the National Weather Bureau online informational services for flood watches and warnings. Owners will be informed annually on the above before the hurricane season (June to November).

e. Structural projects: Property owners subject to coastal flooding should consider floodwalls as a structural means of protection provided the impacts of floodwall are minimized or mitigated. In area no. 2, the proposed road widening project for Lower Honoapiilani Road will consider enlarging the culvert crossing. The desilting basin recently constructed directly above the Honoapiilani Highway will be maintained to insure its effectiveness on water quality and its secondary impact of reducing the

storm peak flow. In area no. 6, the County has initiated the projected ten year Lahaina Watershed Project to divert mauka storm flows to the unnamed gulch adjacent to Launiupoko Beach Park. Construction on its first phase will be initiated in the year 2002. A major new storm drain system was constructed in area no. 7 in year 2000 and has improved the drainage for the area.

f. Public information: Flood information will be disbursed to the individual property owners and copies of various FEMA publications relative to floodproofing, insurance, etc will also be included. Extra copies will be available to owners of properties subject to flooding.

10. Implementation

This Floodplain Management Plan will be under the responsibility of the Planning Director or representative. The Director will be responsible for the implementation of the plan and for presenting an annual update to County Council. The update will provide an overview of the plan and the progress over the previous 12 months toward the implementation of the action items listed in Section 9.

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REPETITIVE LOSS PROPERTY LOCATION MAPS

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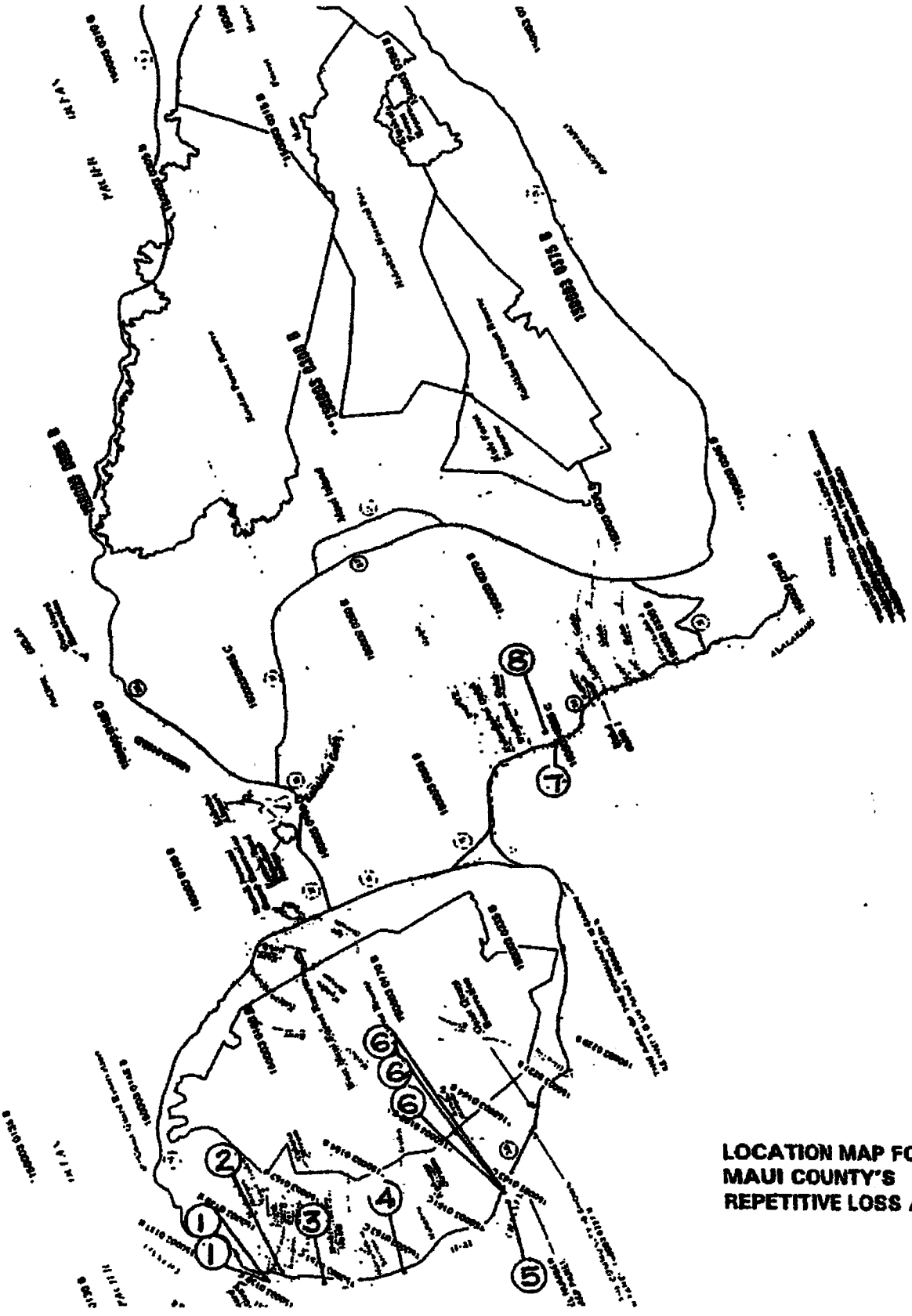
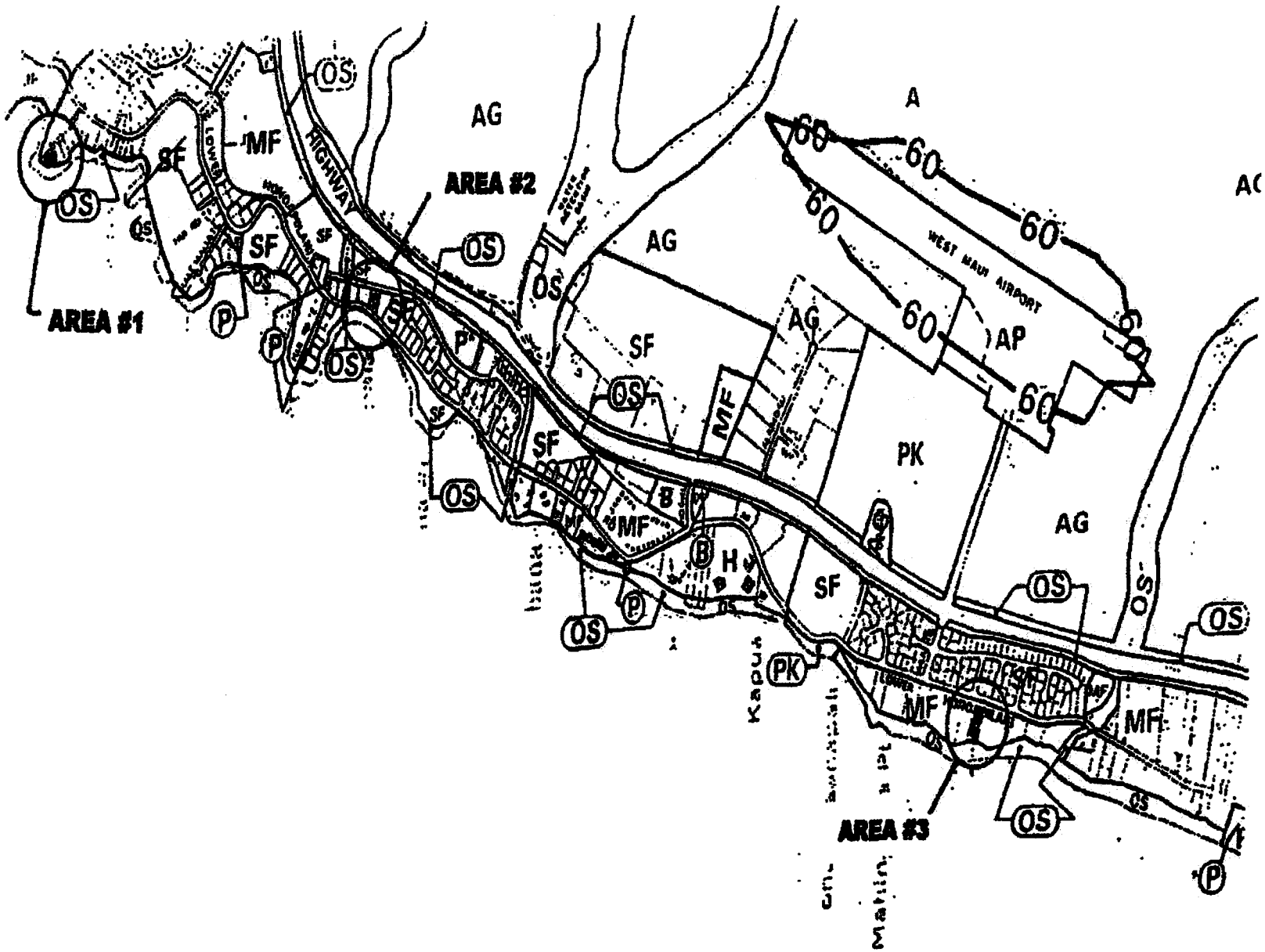


LOCATION MAP FOR MAUI COUNTY'S REPETITIVE LOSS AREAS


AREA #1
AREA #2
AREA #3
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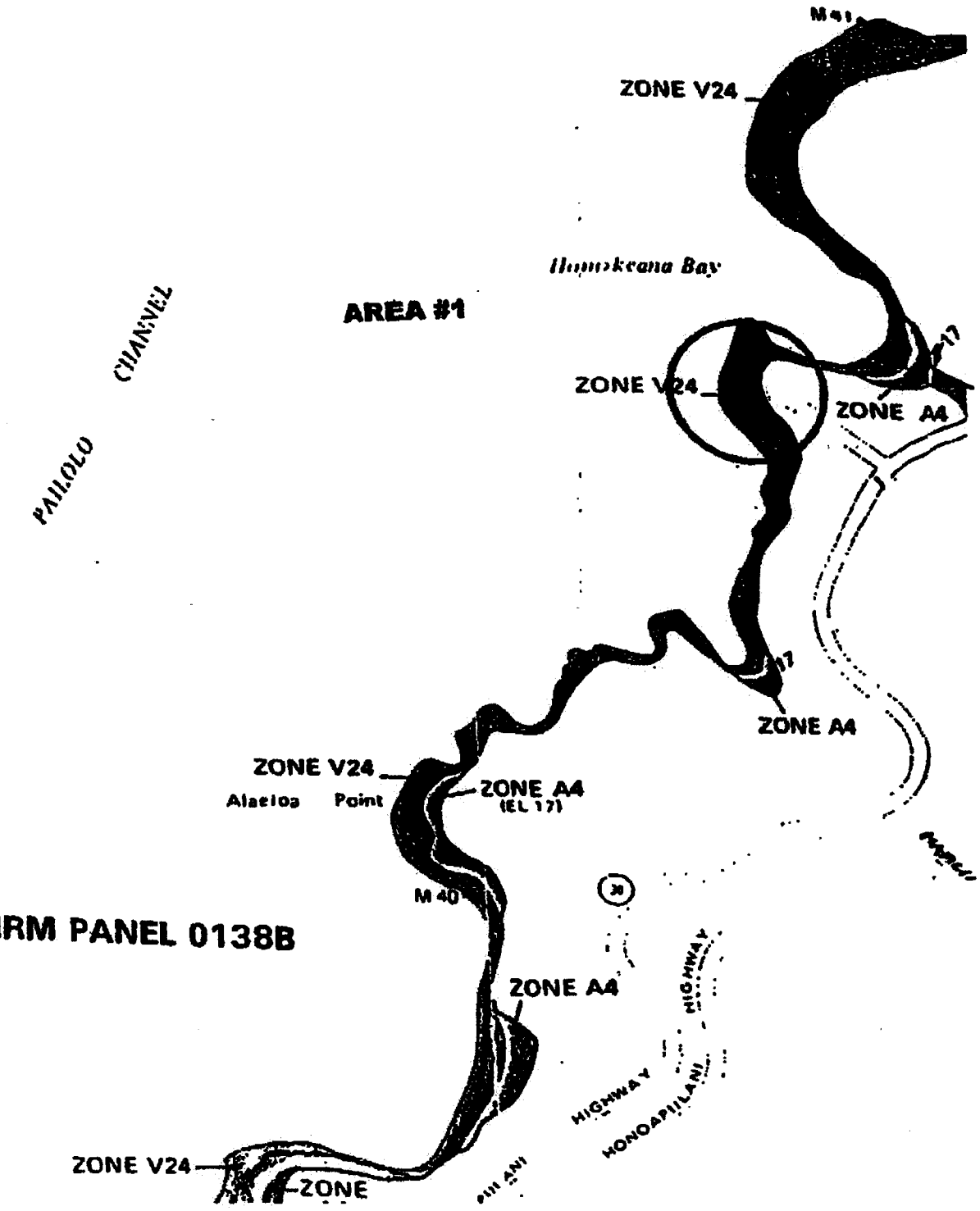
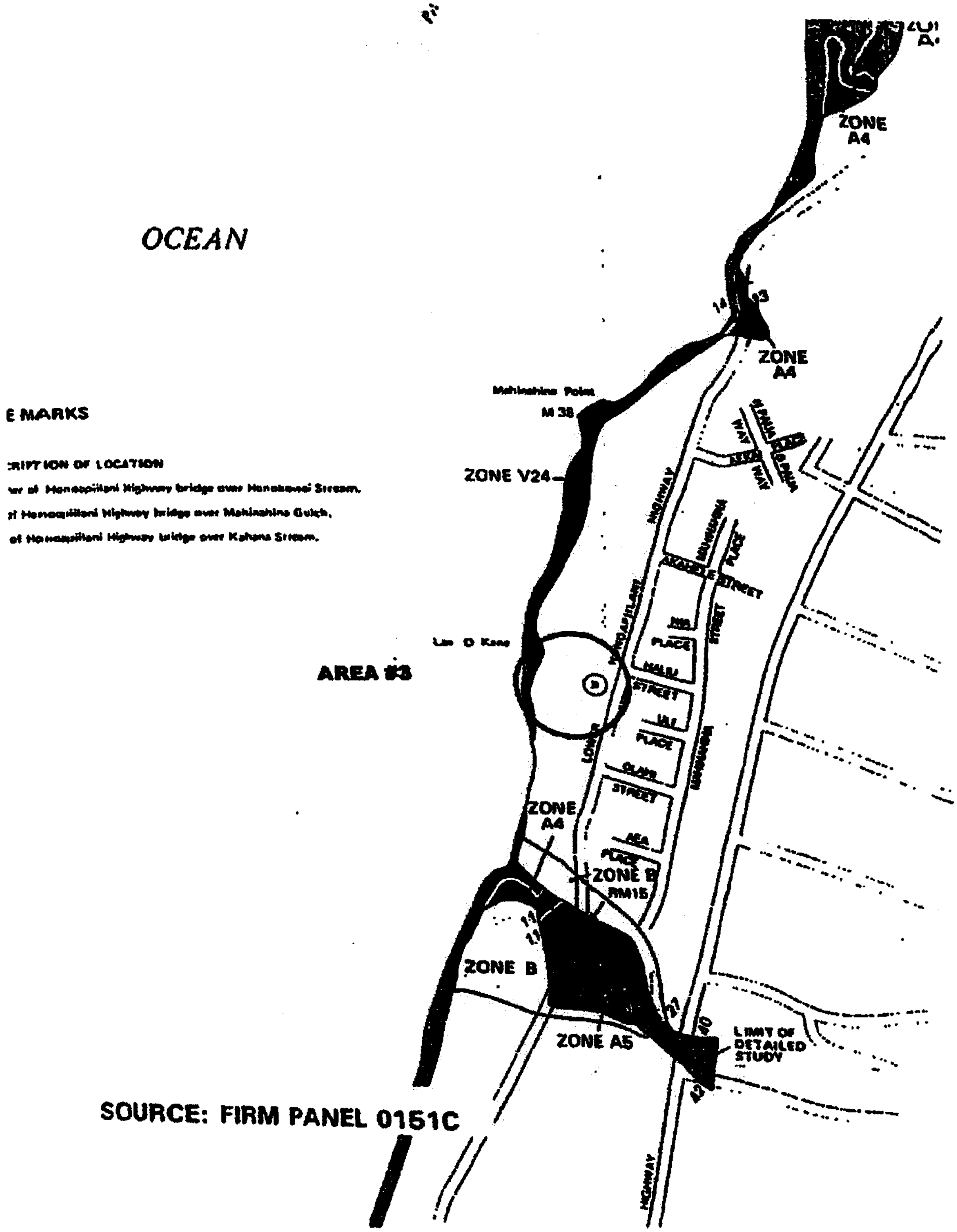
WEST MAUI AIRPORT
HIGHWAY
Kapua
Makila



SOURCE: FIRM PANEL 0138B

SOURCE: FIRM PANEL 0151C
ZONE V24
ZONE A2
LIMIT OF DETAILED STUDY
AREA #2
Kala Point
ZONE V24
HALE MAKAI PLACE
MAUI ROAD
RM 16
Kaa Point
M 39
ZONE A3
LIMIT OF DETAILED STUDY
ZONE A6
ACCESS ROAD
KEPOLA PLACE
ZONE A4



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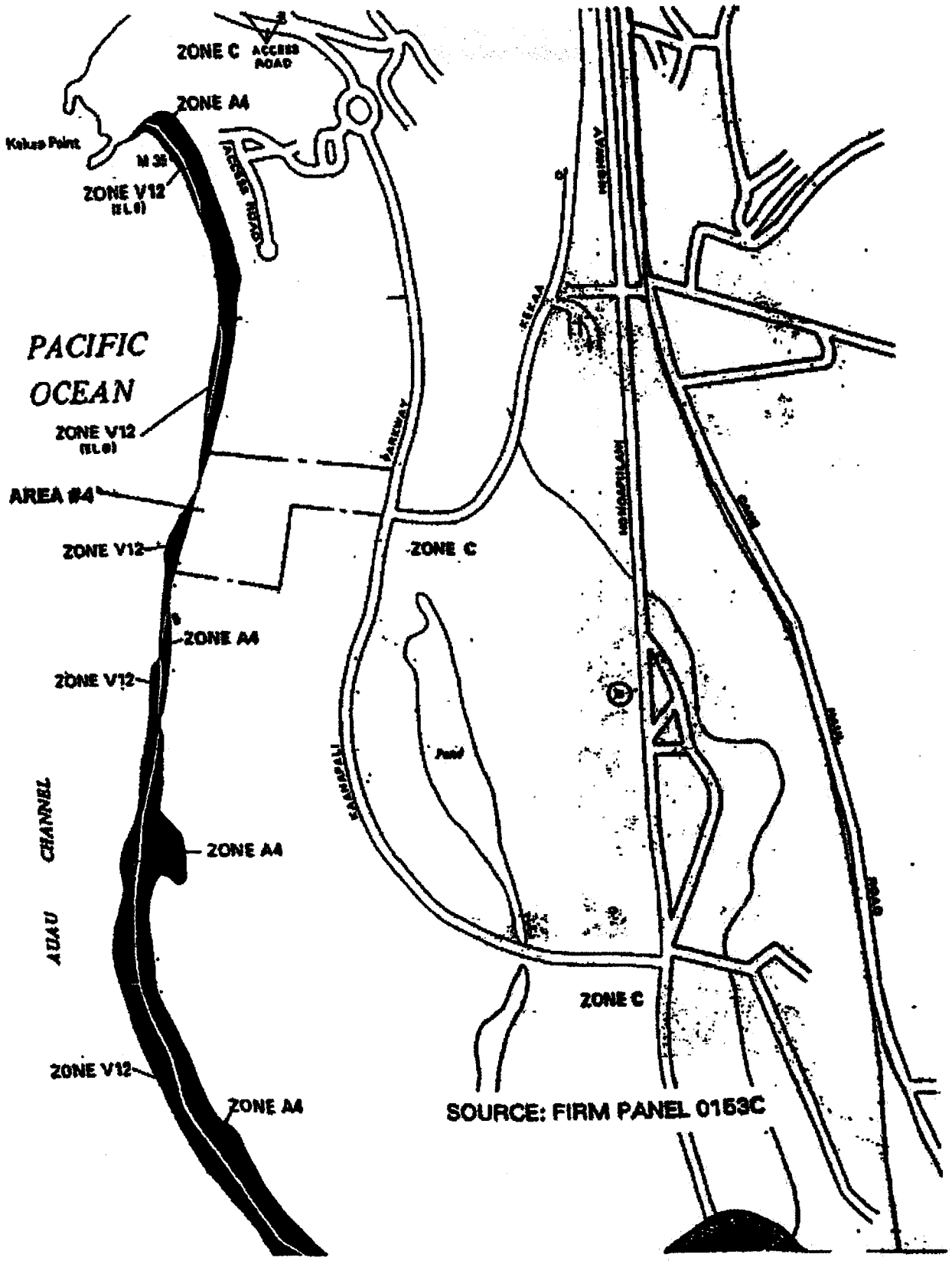
ZONE C
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PACIFIC
OCEAN
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(EL 8)
AREA #4
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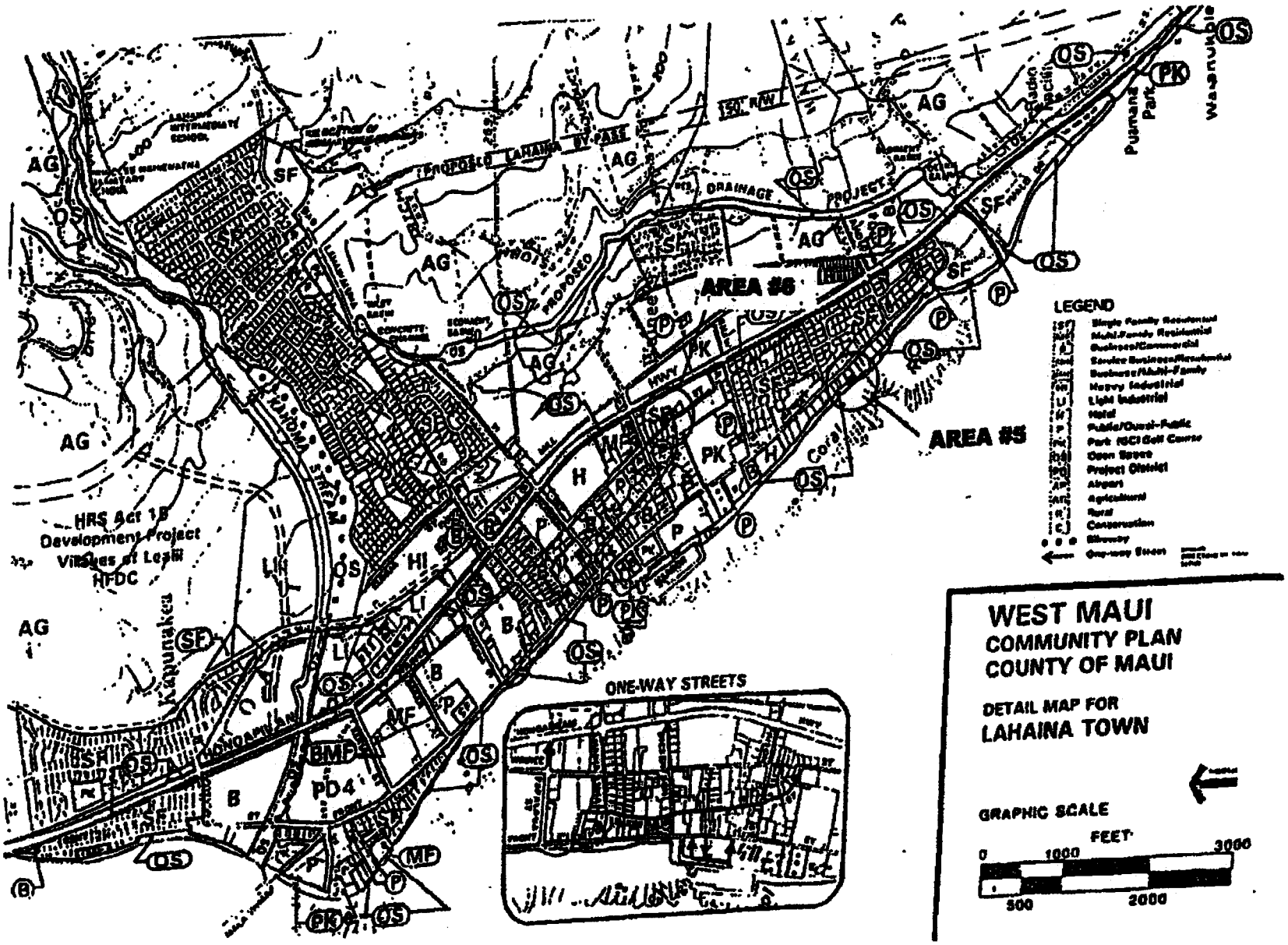
ZONE C
SOURCE: FIRM PANEL 0153C


AREA #6
AREA #5
LEGEND
HRS Act 15
Development Project
Villages of Leilii
HFDC
ONE-WAY STREETS
WEST MAUI
COMMUNITY PLAN
COUNTY OF MAUI
DETAIL MAP FOR
LAHAINA TOWN
GRAPHIC SCALE
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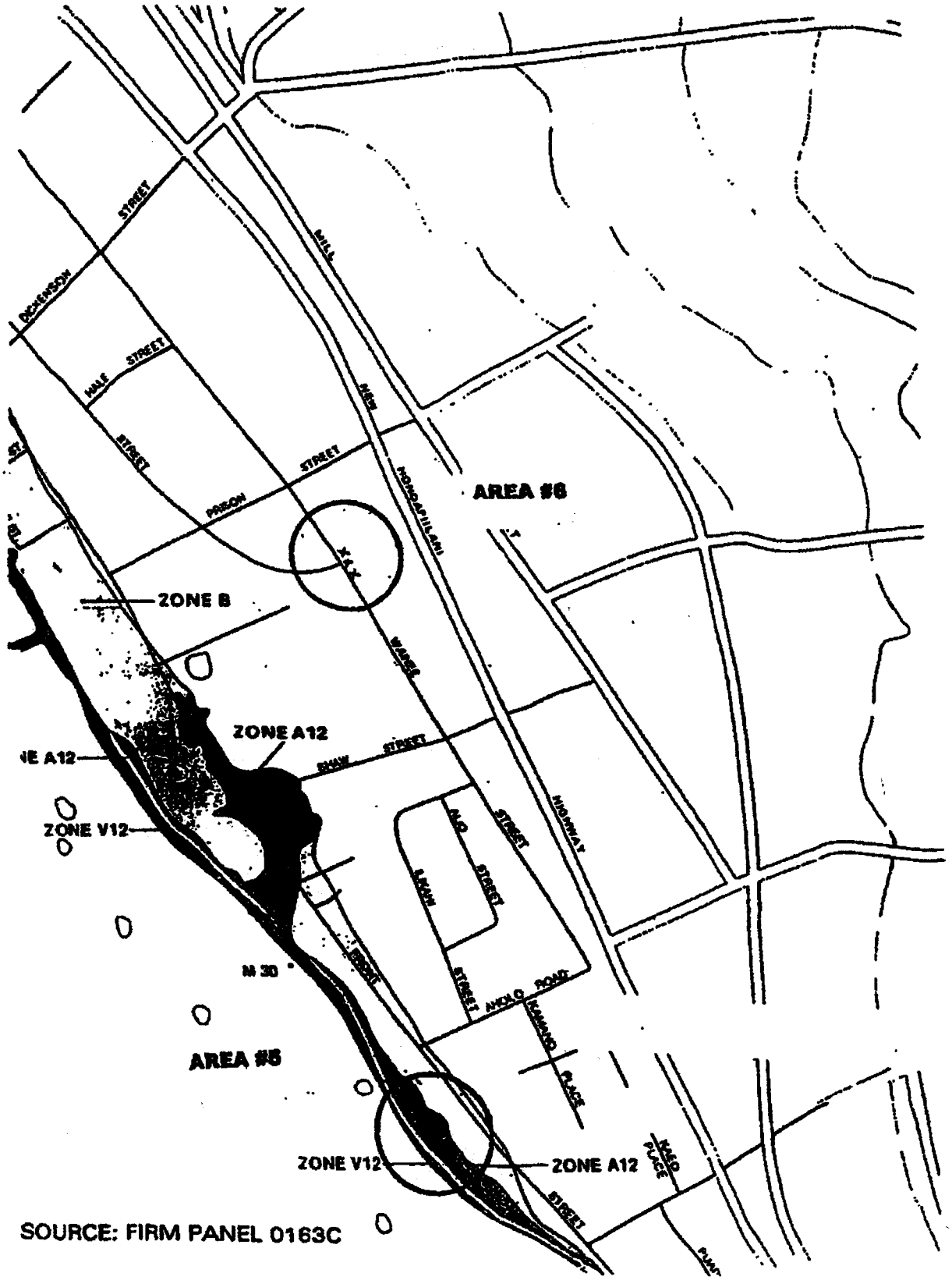

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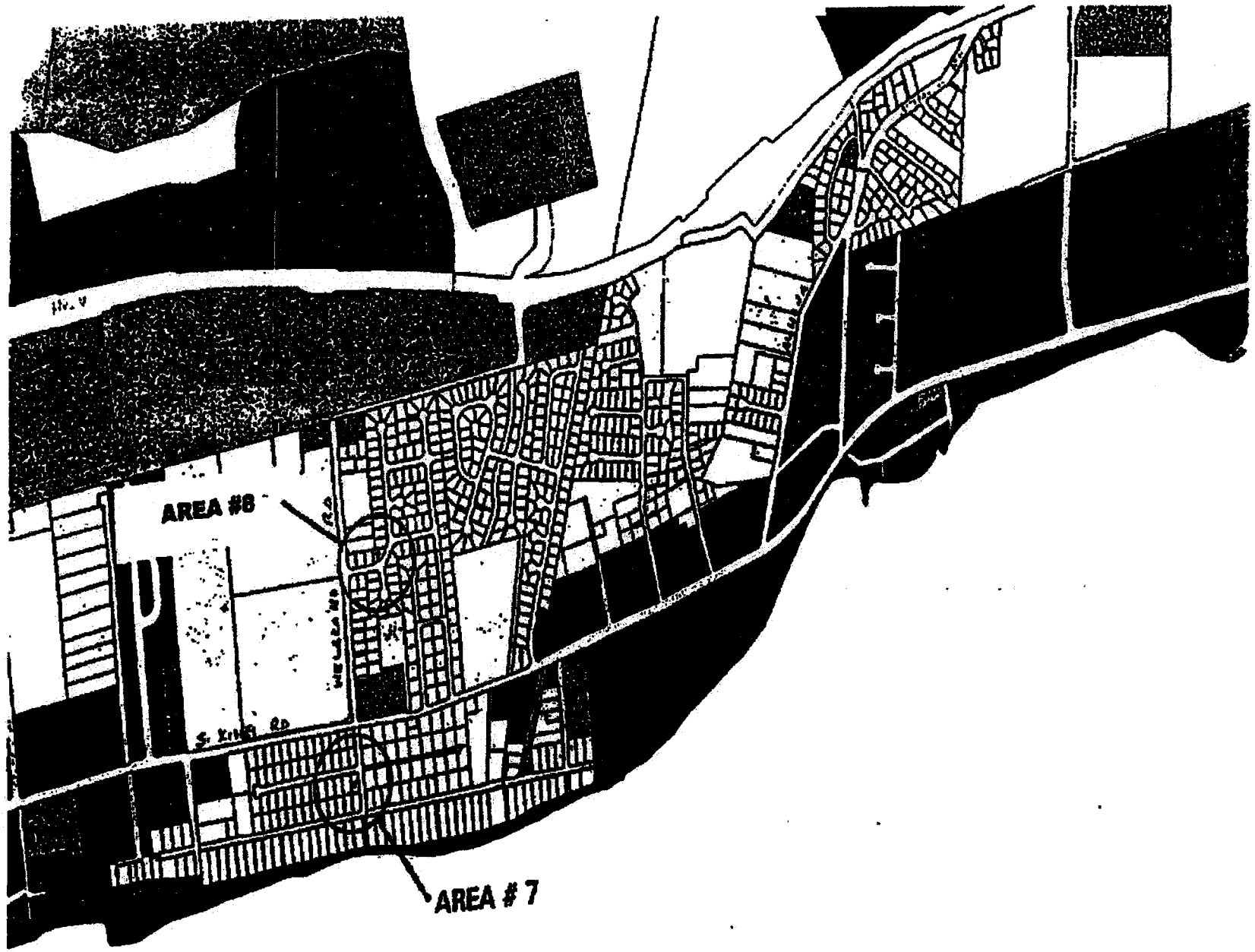
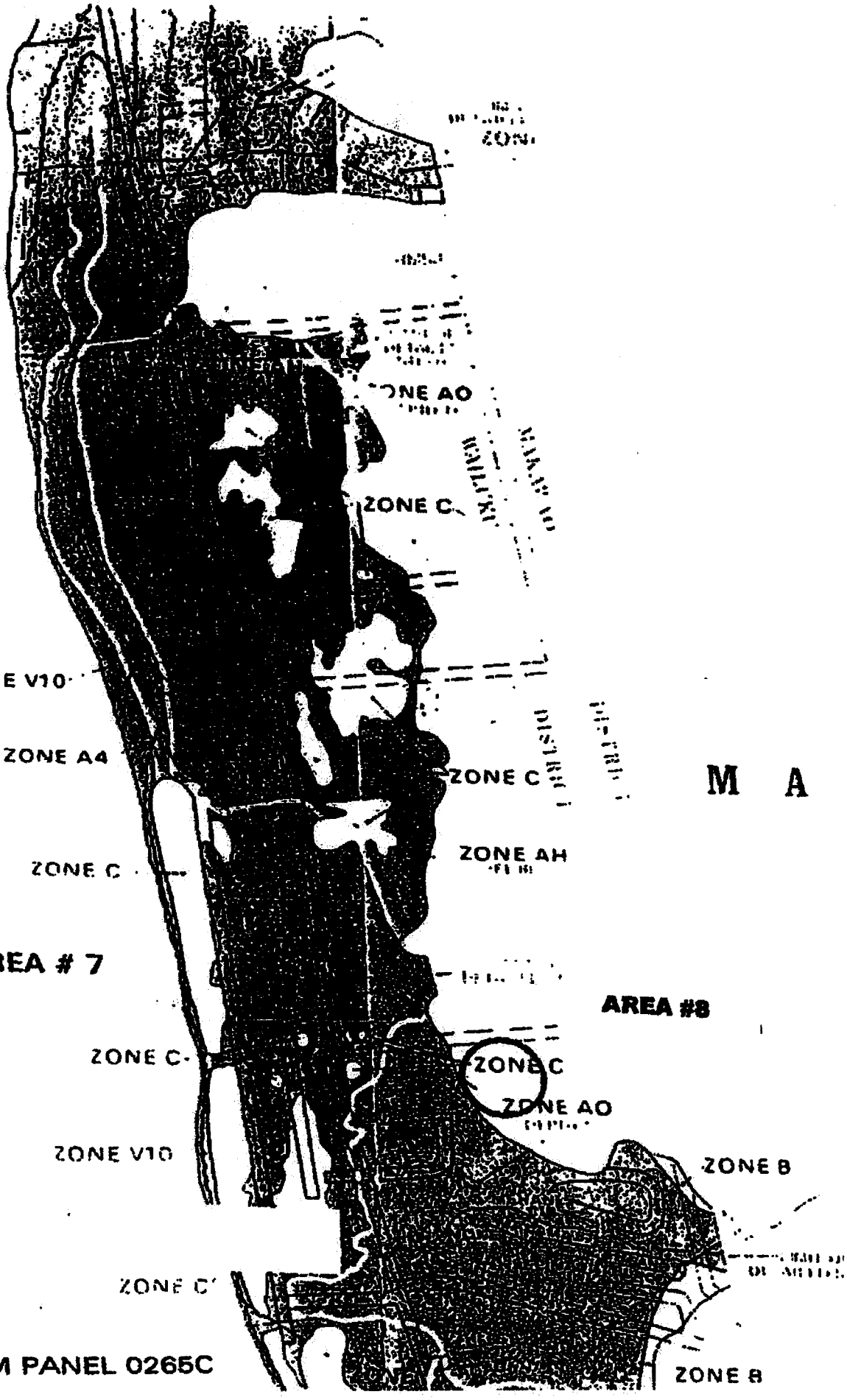

AREA #8
AREA # 7



SOURCE: FIRM PANEL 0265C

COUNCIL OF THE COUNTY OF MAUI
WAILUKU, HAWAII 96793

CERTIFICATION OF ADOPTION

It is HEREBY CERTIFIED that RESOLUTION NO. 01-141 was adopted by the Council of the County of Maui, State of Hawaii, on the 7th day of September, 2001, by the following vote:

MEMBERS	Patrick S. KAWANO Chair	Dain P. KANE Vice-Chair	Alan M. ARAKAWA	Robert CARROLL	G. Riki HOKAMA	Jo Anne JOHNSON	Michael J. MOLINA	Wayne K. NISHIKI	Charmaine TAVARES
ROLL CALL	Aye	Aye	Aye	Aye	Aye	Aye	Aye	Aye	Excused

COUNTY CLERK

COUNTY OF MAUI
REPETITIVE LOSS PROPERTIES
FLOODPLAIN MANAGEMENT PLAN -UPDATED 2016

1. Introduction

Maui County has been identified by the Federal Emergency Management Agency (FEMA) as a Category C Repetitive Loss Community. A Category C Repetitive Loss Community has ten or more repetitive loss properties. A repetitive loss property is one for which two or more claims of $1,000 or more have been paid by the National Flood Insurance Program (NFIP) within any given ten year period since 1978. The County has 35 repetitive loss properties (since 2013).

The County has participated in the NFIP since 1981. In 1996, the County enrolled in the NFIP's Community Rating System (CRS) where flood insurance premiums are reduced when communities implement more than the minimum regulatory requirements. The County has a Class 8 rating with a current annual flood insurance premium savings of approximately $512,000[1]. When a community has ten or more repetitive loss properties, the County is required to adopt a floodplain management plan to more effectively manage the community's floodplain areas.

2. Background

The County of Maui consists of the islands of Maui, Lanai, Molokai and Kaho'olawe and includes a land area of approximately 1,100 square miles and coastline of approximately 250 miles. The Island of Maui has over 140 miles of tidal coastline.

The eleven original repetitive loss properties (RLP) in 2001 were on the south and west shores of the Island of Maui. Two additional RLP were added in 2005, one in central Maui and another property in south Maui.[2] Three additional RLP were added in 2006, two in south and one in west Maui[3]. South Maui received two additional RLP in 2008.[4] The 2013 update added fifteen properties in south Maui, one in central and one in west Maui.[5] The County has a total of thirty-five repetitive loss properties.[6]

3. Hazard Assessment

The repetitive loss properties are subject to either riverine or coastal influenced flooding. Riverine flooding is the result of the storm runoff generated inland and flowing into floodplain lands. Coastal flooding may be the result of an earthquake or high surf and storm surges from large-scale weather systems. Coastal flooding has most recently been related to hurricanes and kona storms. FEMA's flood insurance rate maps (FIRM) designate the 100 year flood inundation limits along the major streams and coastal areas.

4. Problem Assessment

There are eleven repetitive loss properties on the west coast of Lahaina, twenty-two repetitive loss properties on the south coast of Kihei through Maalaea, one in Kahului and one in Wailuku. The Lahaina properties have both riverine and coastal influenced flooding, while the Kihei properties have only riverine

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[1]2009 update showing increase in insurance savings from $300,000

[2]2006 update added two properties to the Repetitive Loss List.

[3]2007 update added three properties to the Repetitive Loss List.

[4]2008 update added two properties to the Repetitive Loss List.

[5]2013 update added seventeen properties to the Repetitive Loss List.

[6]2012 update-no properties were added to the Repetitive Loss List between 2009-2011.

or inland flooding. Coastal flooding on the western coast of Maui ranges from 7 to 17 feet above mean sea level. The Kahului property is the bottom of a natural sump area. Repetitive loss properties that are in the same vicinity were grouped into one of the following repetitive loss areas. The areas are identified on maps starting on page 12.

Area #1- Panel 0262F, Papaua Place, Napili

Two properties located on a rocky point on the Napili coast are partially within the Special Flood Hazard Areas V24, an area of coastal flooding with velocity. The dwellings on the properties are pre-FIRM (1980) structures subject to coastal flooding up to a base flood elevation of 17' mean sea level (msl). Both dwellings are of two story construction with the bottom floors partially or wholly below the base flood elevation.

Area #2 - Panel 0264F, L. Honoapiilani Road, Kahana

The subject property is located within the Kaopala Gulch floodway and subject to flooding from 21' to 30' msl, with a flow velocity of approximately 5.7 feet per second. The existing pre-FIRM structures are located at approximately 19' msl. Other structures in the vicinity are located within the Kaopala Gulch floodway and subject to flooding.

Area #3 - Panel 0263F, L. Honoapiilani Road, Napili

The flooding of two apartment units at The Kuleana apartment complex were caused by a grated drain inlet blocked by debris. The entrances to the two units are located in a depressed side yard with an 8" drain.

When the parking lot's drain inlet, located near the top of the concrete walkway leading to the units became blocked with debris, the runoff water flowed into these two units. The 8" area drain was not sufficient to handle the additional flow. A new grate inlet was installed in 2001 to improve the inlet's efficiency. In addition, the apartment manager stated that the drains are regularly maintained to prevent clogging. This project is within the Special Flood Hazard Area C, an area of minimal flooding.

Area #4- Panel 0353F, Kaanapali Beach, Maui

The subject property is located within the Kaanapali Resort area whose coastline is approximately 2.6 miles long. The Kaanapali Resort area is subject to coastal flooding with runup elevations up to 8' msl. This condominium on Kaanapali Beach consists of Pre-FIRM 1974 structures located on a lot of approximately 6.6 acres. All of the structures are located within the Special Flood Hazard Area zone C, an area of minimal flooding. The current staff has no recollection of the flood damages occurring in the years of 1980, 1992 and 1993. Portions of two of the main structures are located adjacent to the limits of the coastal flood plain and may be subject to coastal flooding. In addition, parking and operational offices are located in a basement level below the base flood elevation which maybe flooded in the event flooding exceeds the 100 year coastal base flood elevation.

Area # 5 - Panel 0362F, Front Street, Lahaina

The entire property is within the Special Flood Hazard Area A4. The Pre-FIRM structure on the property is located approximately 30 feet from the shoreline and subject to coastal flooding up to elevation 8' mean sea level. The structure appears to be below the base flood elevation.

Area #6 - Panel 0362F; Wainee Street, Lahaina

Area #6 includes three adjacent repetitive loss properties that are located within the Special Flood Hazard Area C, an area of minimal flooding. The properties are located upstream and adjacent to an existing rock lined ditch connected to an 18" culvert. These three properties include existing slab-on-grade structures that were all constructed below the pavement grade of Wainee Street. Flooding of the properties occurs when the offsite storm runoff exceeds the capacity of the storm drainage system and backs up into the properties. The majority of the offsite runoff is from agricultural lands above the subject properties.

Area #7 - Panel 0586F, West Welakahao Road, Kihei

The subject property is located within the Kihei flood plain which is approximately 4 miles long and 3/4 miles wide. Keokea Stream drains into the Kihei flood plain. Flooding is attributed to the limited capacity of the stream outlet channel and to sand dunes blocking the surface drainage to the ocean at various beach accesses. The subject dwelling's first floor elevation appears to be slightly above the road shoulder grade. The first floor of the existing Pre-FIRM two story dwelling floods until the sand dune at the beach access is manually or naturally breached. The owner indicated that approximately 4" of flood waters has inundated the dwelling. This property is within the Special Flood Hazard Area AH with a base flood elevation of 7'msl. A new storm drain system (3'x8' box culvert) for the area was installed in 2000 with a grate inlet approximately 50' from the subject property. Similar to other drain outlets, the sand berm at the outlet structure needs to be cleared before the drain becomes operational.

Area #8 - Panel 0588F, Akai Street, Kihei

Flooding of property located at Akai Street is confined to the subject property. The flooding was caused by inadequate drainage for a carport that was converted into a habitable room. A large existing concrete covered patio adjacent to the enclosed carport contributed to the flooding of the new living area. The owner has installed three drywells to assist in the drainage of storm runoff. The owner stated that they have not experienced any flooding since the installation of the drywells over three years ago.

Area #9 - Panel 586F, Waipuilani Road, Kihei

The subject properties are located within the Kihei flood plain which is approximately 4 miles long and 3/4 miles wide. Waipuilani Stream is one of several streams that drain into the Kihei flood plain. Flooding is attributed to a localized low area and the limited capacity of the stream outlet channels due to sand dunes blocking the surface drainage to the ocean. The subject dwellings are at or lower than the road shoulder grade. The existing 1973 pre-FIRM one story dwellings flood until the flood waters percolates into the sandy soil. One of the owners indicated that approximately 20 years ago, the flood depth in the dwelling was nearly one foot. This property is within the Special Flood Hazard Area AH with a base flood elevation of 6 feet mean sea level. One of the owners is considering the installation of flood gates and floodproofing the walls with flood resistant materials. (2006)

Area #10 - Panel 0392E, Aleo Place, Kahului

Aleo Place is a dead end road with no natural drainage. Several large injection well drain inlets were installed for storm runoff. The county installed two permanent drainage force mains for the pumping of the storm runoff during flood occurrences. The previously flood damaged dwelling for the subject property was demolished and replaced with two new dwellings. The finish floors for the dwellings were placed more than five feet above the road pavement. With the drainage force mains installed for flood occurrences, this flood zone C property should have minimal flooding. (2006)

Area #11 - Panel 0263F/0264F, Kohulike Way, Kahana

Kohulike Way is located below the apartment complex of Kahana Gateway. The storm runoff for the Kahana Gateway flows into several drain inlets and finally into a 12" diameter storm culvert located on its northern end of the parcel. The storm system ponds at the 12" culvert headwall before entering the drain system. The ponded runoff has overflowed and flooded three adjacent dwellings on Kohulike Way. Sandbags have been installed by Kahana Gateway that appears to be an interim measure. The sands bags are torn and offer minimal protection for the subject property. The Kohulike Way property owners on Kohulike Way have 4" floor drains to drain their respective roof runoff but their systems are not adequate to handle offsite drainage. (2007)

Area #12 - Panel 0677E, Lanihou Place, Maui Meadows, Kihei

Lanihou Place is a triangular lot that includes a dry gulch on both the northern and southern boundaries. The two gulches merge at a multiple culvert crossing at Lanihou Place. The lands above the lot are open land used for pasturing. The 1983 dwelling is situated on a natural ridge between the two gulches. It appears that much of the ridge was graded to provide for the building pad. The building pad appears lower than the bottom of the gulch for portion of the northern boundary. Sheet flow also

enters the property from the pasture lands. A short rock wall to contain the gulch runoff and offsite sheet runoff has not performed well for the new owner. (2007)

Area #13 - Panel 0559F, S. Kihei Road, Kihei

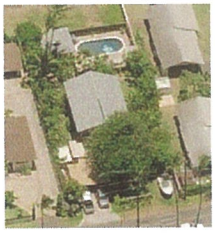
This condominium was built in 1974. The approximately 400 square feet lobby was designed approximately 18 inches below the existing grade with portions of the beach yard draining toward the lobby. The lobby floods when the french drains for the lobby's patio cannot handle the rainfall from the patio and adjacent yard area. Flooding also occurs during high storm surf conditions where the surf breaks through the low sand dune and flows into the lobby area. Additional flooding occurs to the units fronting South Kihei Road when adjacent rock lined Waiakoa Stream overflows its banks into the condominium. (2008)

Area #14 - Panel 0588F, Uilani Street, Kihei

The dwelling at Uilani Street was built in 1970. During 1976, an enclosed patio/office/addition was constructed on grade or 4 inches below the finish floor of the dwelling. A concrete masonry block (CMU) and rock wall surrounds most of the property. The property is subject to one foot shallow flooding from Keokea Gulch located on the southern boundary of the property. According to the owner, flooding occurred when ponded flood waters behind the southern boundary wall migrated under her wall and quickly flooded her yard and enclosed patio and additions. (2008)

Area #15 – Panel 0586F, S. Kihei Rd., Kihei

Area 15 includes four adjacent repetitive loss properties. The dwellings at these addresses are post and pier construction and, according to the owner, although flood waters did not enter into the structures, a lot of mud and debris were deposited on the footings and under the houses. The flooding occurred when Waipuilani Gulch overflowed at the culvert intersecting S. Kihei Road. The water was then diverted onto the road and mud and debris entered from the north side of the property as well as from S. Kihei Road. As a result the owners put a rock wall along their northern property boundary and a berm on their driveway at the entrance to S. Kihei Road.



Area #16 – Panel 0586F, Uluniu Rd., Kihei

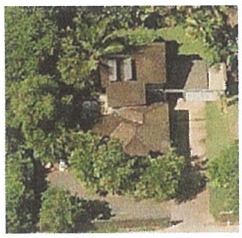
According to real property tax records, the house at this address was constructed in 1964. In 2011 this property suffered a substantial flooding event. Flood waters infiltrated the first floor up to approximately 3 feet. Due to the extensive nature of the damage, the owner's repairs were considered a substantial improvement which required that the house be raised to conform to the current flood regulations. The owner raised the house approximately 4 feet above existing grade.

Area #17 – Panel 0586F, S. Kihei Rd., Kihei

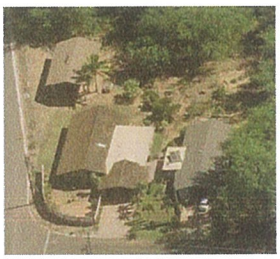
The subject properties are located within the Kihei flood plain which is approximately 4 miles long and 3/4 miles wide. These properties lie between the Waipuilani and Keokea streams which drain into the Kihei flood plain. Flooding is attributed to a localized wetlands area which is directly adjacent and across the street from the properties.

Area #18 – Panel 0588F, S. Kihei Rd., Kihei

Although located on separate FEMA panels, Area #18 lies in close proximity to Area #17 and is affected by the same flooding sources. The house at this address was constructed in 1961. According to the owner, flood waters from S. Kihei Road entered the property from the driveway and traveled through the carport and into the living area on the first story.



Area #19 – Panel 0588F, Alaloa Road, Kihei



This property is located within flood zone X, an area of minimal flooding, but it is adjacent to a drainage way. The structures were built in 1979 and 1988. Flood waters travel west from Piilani Hwy down toward the ocean.

Area #20 – Panel 0588F, Peke Place, Kihei

This dwelling was constructed in 1974. The property lies in both flood zone X, an area of minimal flooding as well as in AO with a flood depth of 1'. Kihei Gulch borders the property on the south.

Area #21 – Panel 0588F, Keala Place, Kihei

Dwellings on this property were constructed in 1966 and 1970 and are pre-FIRM structures. This property lies in the AE flood zone with a base flood elevation of 8' lmsl. Kihei Gulch runs to the south of the property.

Area #22 – Panel 0559F, S. Kihei Rd., Kihei

Maalaea Surf condominiums were built in 1973. Along the south border of this property there is a cemented drainage channel, which crosses under the road and brings riverine flood waters down from the mountain to the ocean. This property is within the Special Flood Hazard Area Zone VE with a base flood elevation of 12' msl but is influenced not only from coastal flooding but from riverine as well.

Area #23 – Panel 0558F, Hauoli Street, Wailuku

This condominium was built in 1975 and is located within flood zone X, an area of minimal flooding. Along the northern border runs Waihee Ditch and along its eastern border is the ocean. This property has the potential for both coastal and riverine flooding. In this flood event, water was not contained within the box culvert and the over flow jumped onto the road and came onto the property, flooding the parking lot and a ground floor unit. According to the resident manager, the County came out to fix the road above the culvert to create a concave channel so that if flood waters over topped the culvert, the waters would be channeled back into the ditch at the other end.

Area #24 – Panel 0263F, L. Honoapiilani Rd., Lahaina

These condominiums were built in 1976 and are located within the Special Flood Hazard Area zone VE with a base flood elevation of 14' msl. The southern end of the property is adjacent to a drainage culvert which empties onto a beach which is experiencing erosion of the shoreline.

5. Public Involvement

All of the owners of repetitive loss properties or their representatives were contacted by phone. The County conducted onsite interviews of the six owners/representatives for input on their flooding and flood proofing measures. Phone interviews were also done with one owner. The other property owners did not return our phone inquiries. In addition, a public meeting was held on June 22, 2001 to solicit comments on the draft floodplain management plan. No one spoke at the public meeting. Finally, copies of the plan were sent to each property owner for review and comment. One property owner responded in writing and another by phone.

6. Coordination

A meeting was held with members of the Department of Public Works and Waste Management, Maui County Civil Defense and Planning Department to determine the goals, possible activities and action plan. The draft plan was sent to the State floodplain coordinator and Insurance Service Offices, Inc., for their review and comments.

7. Goals

a. Protect the homes and buildings in the repetitive loss areas;
b. Develop a flood warning system for flash flooding.

8. Review of Possible Activities

This section is to evaluate possible measures to address the flood problems affecting the repetitive loss properties. In summary we have thirty-five repetitive loss properties located within twenty-four repetitive loss areas on Maui as described above. The twenty-four areas can be further categorized into following:

Coastal flooding: areas nos. 1, 4, 5, 13[7], 22[13] and 24[13]
Riverine flooding: areas nos. 2, 6, 7, 9[8], 10[9], 12[10], 14[11], 15-21[13], 23[13]
On site flooding: areas 3, 8, 11[12], 13

For each of the categories, proposed activities such as preventive, property protection, emergency services, structural projects, and public information were evaluated and summarized as follows:

PREVENTITIVE: Preventive activities keep flood problems from getting worse. The use and development of flood prone areas is limited through planning, land acquisition, or regulation. They are administered by rules and regulations governing land use, open space preservation, floodplain regulations, storm water management, drainage system maintenance and dune/beach management.

Coastal flooding: areas nos. 1, 4, 5, 13, 22 and 24

All the structures in these areas were constructed before the current floodplain regulations were in effect, and are considered as existing nonconforming structures. The current floodplain regulation allows construction, i.e. additions, renovations and alterations to the current structures without any compliance to the floodplain regulation provided the cost of construction is not more than fifty percent of the value of the existing structure. If the construction costs exceed the fifty percent criteria, the entire structure will be required to comply with the current standards. The proposed preventive action will be to reduce the construction threshold of fifty percent to ten percent over a five year period before compliance to the current floodplain standards for new construction is required.

Riverine flooding: areas nos. 2, 6, 7, 9, 10, 12, 14, 15-21 and 23

Preventive activities included maintenance of the respective drainage systems at a minimum interval of one year. In addition, the County's standard operating procedure (SOP) to address potential flooding. The SOP included cleaning or opening of all critical storm drain/channel outlets and to have staff

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[7]2008 update
[8]2006 update
[9]2006 update
[10]2007 update
[11]2008 update
[12]2007 update
[13]2013 update

on alert for possible drainage problems when general flooding conditions occur. The drainage ways on Area 12 are privately owned and maintained.

On site flooding: areas nos. 3, 8, 11 and 13

Preventive activities included maintenance by the owners of the respective drainage systems at a minimum interval of one year. Area no. 11 will need the cooperation of the adjacent owner to maintain their system so no ponded runoff overflows into area no. 11.

PROPERTY PROTECTION: Property protection activities are usually undertaken by property owners on a building-by-building or parcel-by-parcel basis such as relocation, acquisition, building elevation, flood proofing, sewer backup protection and flood insurance.

Coastal flooding: areas nos. 1, 4, 5, 13, 22 and 24
Riverine flooding: areas nos. 2, 6, 7, 9, 10, 12, 14, 15-21 and 23
On site flooding: areas nos. 3, 8, 11 and 13

Relocation and acquisition were discussed but deemed too costly. Elevation and flood proofing activities were favored as being more practical. More than half of the properties do not have flood insurance and would not be covered for future flood damages. The property owners should be encouraged to obtain flood insurance. Repetitive loss property owners can also benefit from NFIP's Increased Cost of Compliance program. The property in area #16 elevated his house using ICC funds when his repairs were deemed a substantial improvement.

EMERGENCY SERVICES: Emergency service activities are taken before and during a flood to minimize its impact. These measures are the responsibility of the County's Civil Defense Agency.

Coastal flooding: areas nos. 1, 4, 5, 13, 22 and 24
Riverine flooding: areas nos. 2, 6, 7, 9, 10, 12, 14, 15-21 and 23
On site flooding: areas nos. 3, 8, 11 and 13

For tsunami warnings (coastal flooding), over 50 sirens are utilized as part of the warning system. The siren system is activated using Police radio frequencies. In the near future, the system will be converting from the Police VHF to the Police 800MHz radio system. Since flash flooding for specific areas are difficult to predict, up to date information of storm activities is essential for the public protection. Weather information can be obtained through National Oceanic Atmospheric Administration (NOAA) radio, the internet, radio and television stations. The more sophisticated NOAA weather radios incorporate a weather alert feature which provides an alert sound notification for severe weather situations. Also, the property owners will need to be aware of local flooding conditions and to remain alert and vigilant during heavy rains and possible flash flooding situations.

STRUCTURAL PROJECTS: Structural projects keep flood waters away from an area with a levee, reservoir, or other flood control measures, i.e., flood walls, diversions, channel modifications, beach nourishments, storm sewers, etc.

Coastal flooding: areas nos. 1, 4, 5, 13, 22 and 24

Flood walls where adverse impacts to the adjacent areas are minimized are encouraged.

Riverine flooding: areas nos. 2, 6, 7, 9, 10, 12, 14, 15-21 and 23

Area no. 2: The road culvert on the Lower Honoapiilani Road could be upgraded to increase its flood carrying capacity. A desilting basin was installed in year 1998 above the subject area reducing the peak storm for this area.

Area no. 6: The projected 10 year Lahaina Watershed Project diverting the storm flows from above Lahaina to the unnamed gulch adjacent to Launiupoko Beach Park has started. The consultant contract for the preparation of the environmental assessment and obtaining the required permits is currently being

negotiated. The engineering design for the first phase of the project which includes the outlet to Kauaula Stream is being done by the National Resource and Conservation Service fka Soil Conservation Service of the Federal Department of Agriculture. It is anticipated that construction bids for the project will be requested in the year 2002. The Lahaina Drainage System Master Plan was not considered since current funding has not been available. A repetitive loss property owner's suggestion that the upstream culvert crossings on Honoapiilani Highway be closed or modified was discussed, but determined to not be feasible due to its ramifications on the vehicular traffic on the highway. (2001)

Area no. 7: A new storm drainage system was installed during the year 2000. The system has improved the drainage of the area.

Area no. 9: Flooding occurs on high rainfall storms because of the lack of a storm drainage system in the area. The low lying area generally drains when the flood waters breaches the sand dunes on the coast with the remaining flood waters draining by percolation. A low flood wall and flood gate could be utilized on the perimeter of the property to prevent flood waters from entering the property during flood occurrences. Another option is to floodproof the dwelling's walls and door openings. (2006)

Area no. 10: The cul-de-sac for Aleo Place was improved in 2006 with two large intake injection wells and two force main stands to pump excessive flood flows from the cul-de-sac. During times of heavy rainfall, large capacity pumps are brought in and directly connected to the pump stands. The pumps stands are connected permanently with a force main to a drainage inlet on the adjacent street outside of the Aleo Place drainage basin. (2006)

Area no. 12: The existing gulch on the northern boundary has been altered and is not able to contain storm flows. The gulch should be restored to its original condition or designed and reconstructed to minimize its impacts on the subject, adjacent and downstream properties. (2007)

Area no. 14: Flooding of the dwelling can be reduced by redirecting the flood waters away from the dwelling's rear entries by berms or grading to the side yards. The runoff can be disposed by drainage catch basins or re-grading the side yard to drain to the street frontage.

Area no. 15: The property owners have put a rock wall along their northern boundary and a berm across their driveway to prevent flood waters from entering into their property.

Area no. 16: Following a substantial flood event, the owners of this property used ICC funds to elevate their pre-FRIM structure approximately 4 additional feet to comply with current flood regulations. The repairs were so extensive; they were deemed a substantial improvement.

Area nos. 17-20: Flooding is attributed to a localized low area and the limited capacity of the stream outlet channels due to sand dunes blocking the surface drainage to the ocean. The existing pre-FIRM dwellings flood until the flood waters percolate into the sandy soil and/or the sand dunes are breached. Flood walls and driveway berms can be utilized to redirect the flood waters away from the dwellings.

Area no. 21 and 24: This property could possibly benefit from a driveway berm to prevent flood waters from entering the property from the road and collecting in the parking lot. A pump could be installed to pump flood waters from the parking out into the drainage channel adjacent to the property.

Area no. 23: The box culvert at the road crossing could be increased in size. The property's resident manager stated that the County came out to fix the road above the culvert to create a concave channel so that the flood waters that were not contained within the gulch would be somewhat contained within the channel and be deposited into the gulch at the other end of the road.

On site flooding: areas nos. 3, 8, 11 and 13

Drainage improvements installed by the owners of areas 3 and 8 have resolved the flooding for the respective properties provided the drainage systems are properly maintained.

Area no. 11: A flood wall between Kahana Gateway and the Kohulike Way dwellings could provide additional flood protection. According to the design calculations on file with Dept of Public Works, the existing drainage system for the Kahana Gateway was designed to handle the runoff generated by the Kahana Gateway. The design capacity can be reduced if the system is not properly maintained, i.e. plugged with debris. (2007)

Area no. 13: A flood wall and gate on the top of the existing retaining wall of the lobby patio would provide protection from rainfall runoff off the yard and the occasional high storm surf. A permanent or temporary pump should be installed in the lobby patio to drain the storm runoff generated from the patio area. (2008)

PUBLIC INFORMATION: Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural beneficial functions of local floodplains. i.e. map information, outreach projects, real estate disclosures, technical assistance, library, etc.

Coastal flooding: areas nos. 1, 4, 5, 13, 22 and 24
Riverine flooding: areas nos. 2, 6, 7, 9, 10, 12, 14, 15-21 and 23
On site flooding: areas nos. 3, 8, 11 and 13

All property owners would be better informed with the detail flooding affecting their respective properties and with technical bulletins and publications for elevating and flood proofing of their homes. The "Increased Cost of Compliance" and flood insurance programs should also be provided to homeowners.

9. Action Plan

a. Floodplain Regulations: The County will amend its floodplain regulations to reduce the construction permitted before full compliance with flood standards is required. The current regulations allow the cost of construction to fifty percent of the existing value of the structure before compliance is required. The proposal is to change the threshold to ten percent over a five year period. Our current flood ordinance was recently reviewed by FEMA and proposed changes were recommended. We will be drafting an ordinance incorporating the recommended FEMA changes and the threshold amendment for the Planning Commission review by the third quarter of fiscal year 2009. The ordinance should be transmitted to the County Council for adoption by fourth quarter of fiscal year 2009.

b. Flood Maintenance: Maintenance of the area drainage systems by the County or respective property owners will be done. The County will record its maintenance activities. The property owners with private systems will be inspected on an annual basis prior to the hurricane season (June to November).

c. Property protection: Repetitive loss property owners will be informed on the benefits of flood insurance, floodproofing and elevating nonconforming structures. The County will transmit copies of respective FEMA publications to the repetitive loss property owners.

d. Emergency services: To improve the effectiveness of the 50 sirens for tsunami warnings (coastal flooding), the County is converting to 800mhz sirens. Since flash flooding for specific areas are difficult to predict, up-to-date information of storm activities is essential for the public's protection. Information will be disbursed on the National Oceanic Atmospheric Administration (NOAA) radio and auto alert (costing less than $80) to inform owners of pending flooding for the area. Also, the property owners will be informed of the National Weather Bureau online informational services for flood watches and warnings. Owners will be informed annually on the above before the hurricane season (June to November).

e. Structural projects: Property owners subject to coastal flooding should consider floodwalls as a structural means of protection provided the impacts of floodwalls are minimized or mitigated. In area no. 2, the proposed road widening project for Lower Honoapiilani Road will consider enlarging the culvert

crossing. The desilting basin recently constructed directly above the Honoapiilani Highway will be maintained to insure its effectiveness on water quality and its secondary impact of reducing the storm peak flow. In area no. 6, the County has initiated the projected ten year Lahaina Watershed Project to divert mauka storm flows to the unnamed gulch adjacent to Launiupoko Beach Park. Construction on its first phase will be initiated in the year 2002. A major new storm drain system was constructed in area no. 7 in year 2000 and has improved the drainage for the area. (2001) Area no. 11 could reduce it exposure to flooding if a floodwall was constructed to contain the offsite runoff. The flooding of area no. 12 can be eliminated by restoring or reconstructing the gulch to contain the storm flows.(2007). Flood walls and gates would mitigate most of the flooding to the ground floor units for area nos. 13, 22, 23 and 24. Onsite drainage catch basins and berms can redirect the flood water away from the dwelling thereby reducing the flooding to the dwelling located at area nos. 14, 17-21. (2008) Area no. 15 has constructed a wall along the northern boundary of their property with driveway berms to prevent flood waters from entering their property. Area no. 16 has elevated the house approximately four feet to prevent infiltration of flood waters into the home.

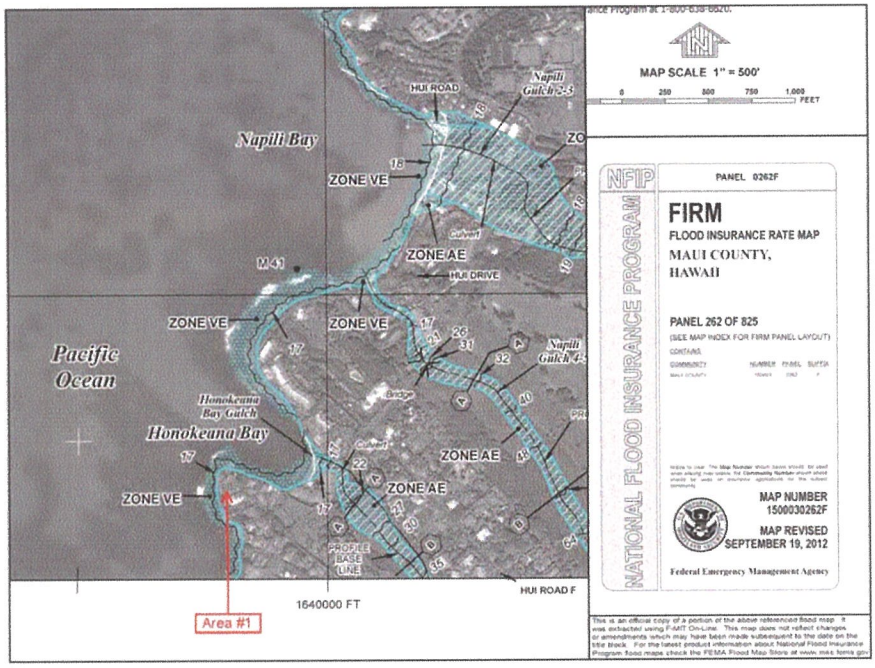
f. Public information: Flood information will be disbursed to the individual property owners and copies of various FEMA publications relative to floodproofing, insurance, etc will also be included. Extra copies will be available to owners of properties subject to flooding. An annual outreach letter is sent to repetitive loss properties informing the owners on the potential flooding of their properties, flood insurance and flood proofing measures available.

10. Implementation

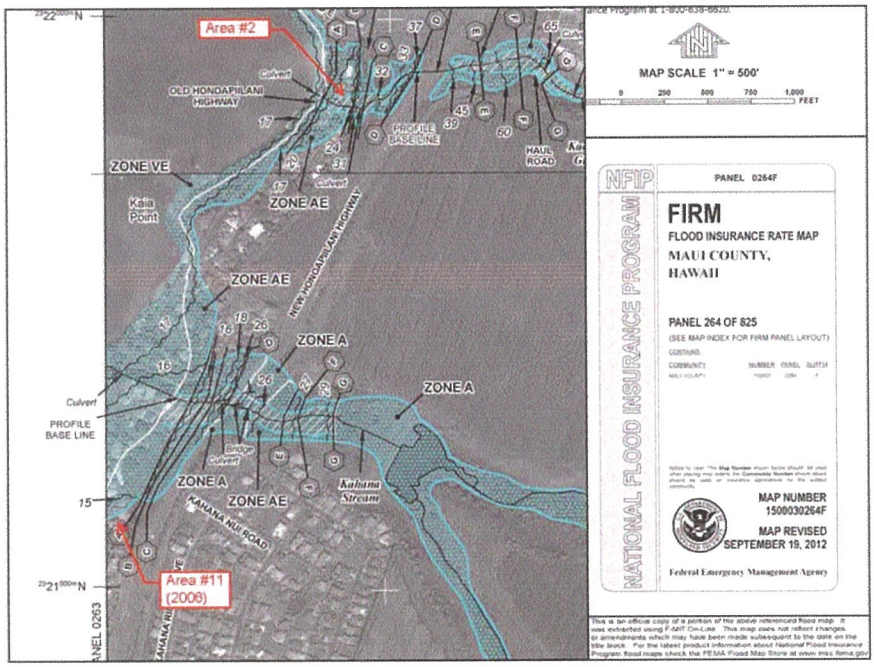
This Floodplain Management Plan will be under the responsibility of the Planning Director or representative. The Director will be responsible for the implementation of the plan and for presenting an annual update to County Council. The update will provide an overview of the plan and the progress over the previous 12 months toward the implementation of the action items listed in Section 9.

LOCATION MAPS FOR REPETITIVE LOSS PROPERTIES

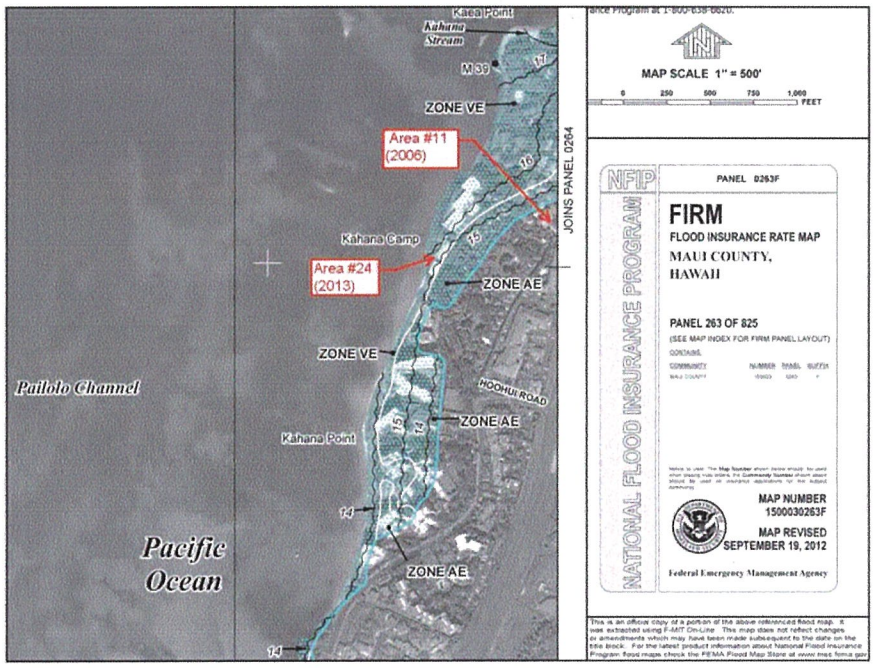
#1 Papaua Pl, Napili



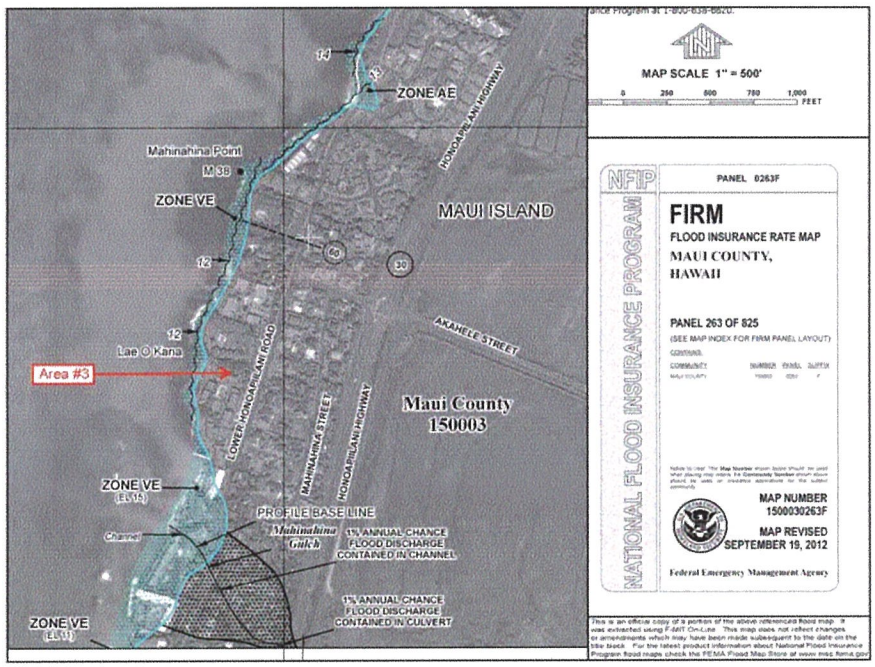
#2 Lower Honoapiilani Rd, Kahana
#11 Kohulike Way, Kahana (straddles panels 0264F/0263F)



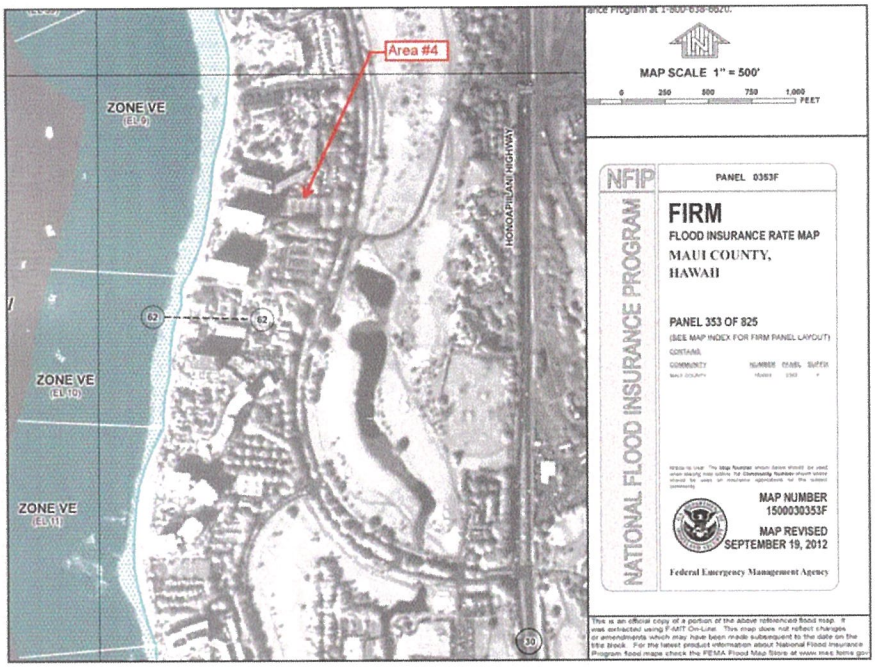
#11 Kohulike Way, Kahana (straddles panels 0264F/0263F)
#24 Lower Honoapiilani Rd, Lahaina



#3 Lower Honoapiilani Rd, Napili

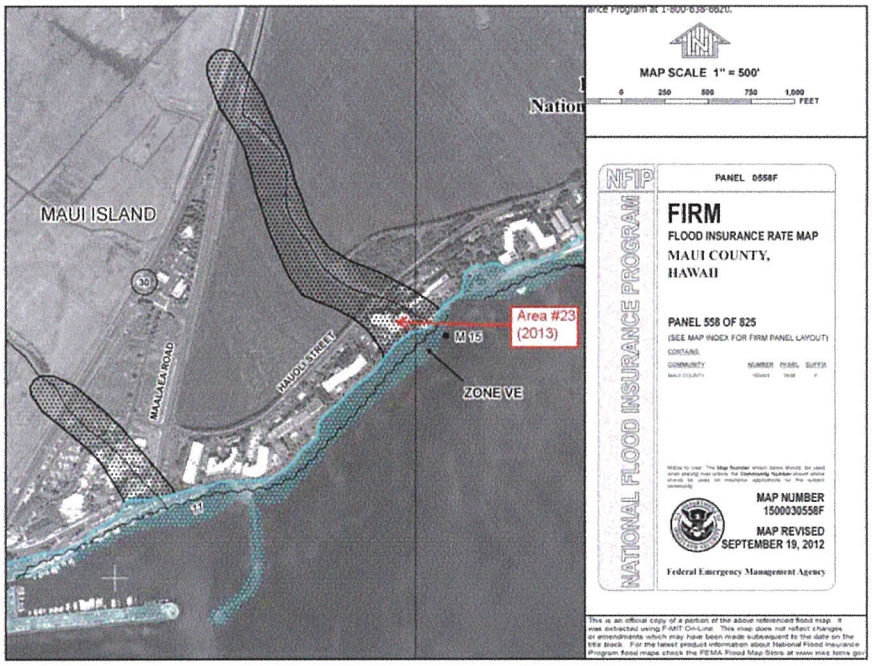


#4 Kaanapali Beach, Lahaina

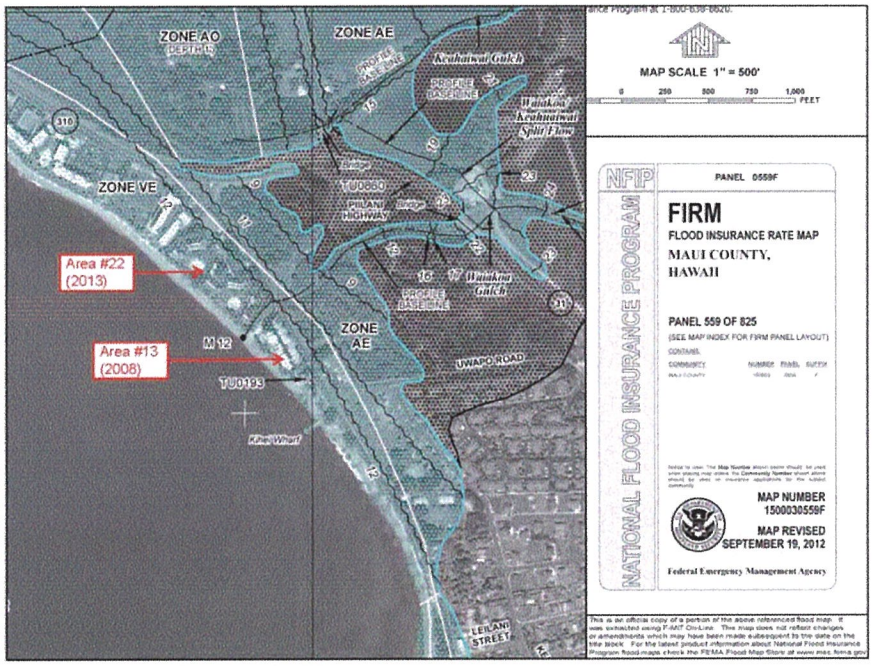


#5 Front St, Lahaina
#6 Wainee St, Lahaina

#23 Hauoli St, Wailuku

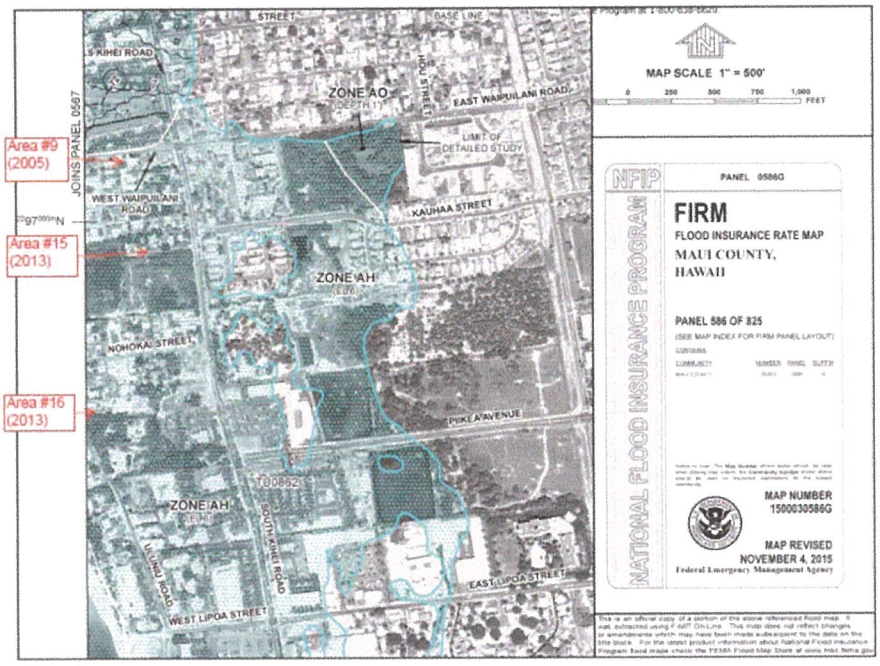


#13 South Kihei Rd, Kihei
#22 South Kihei Rd, Kihei

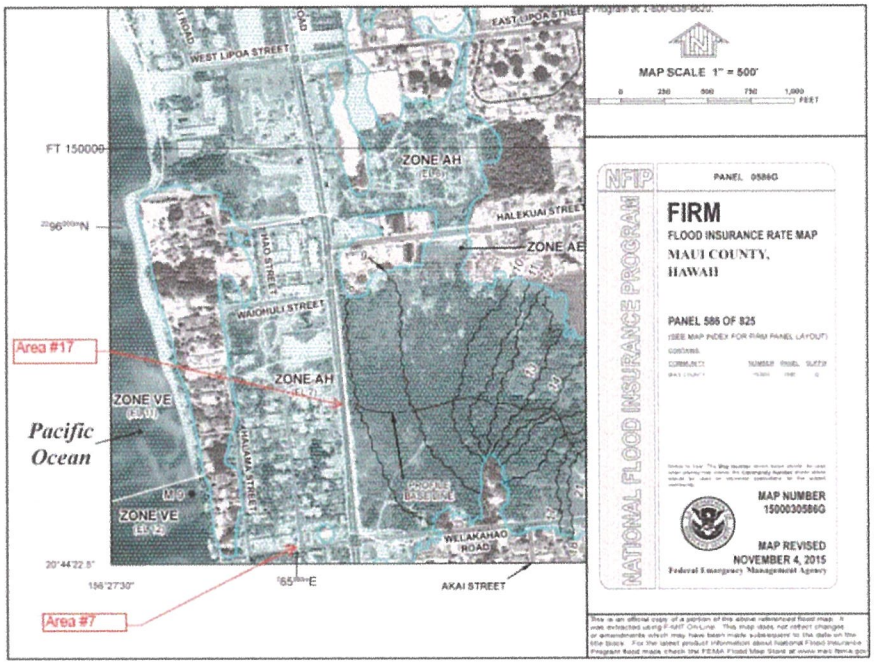


#12 Lanihou Pl, Kihei panel 0677E not printed (zone X)

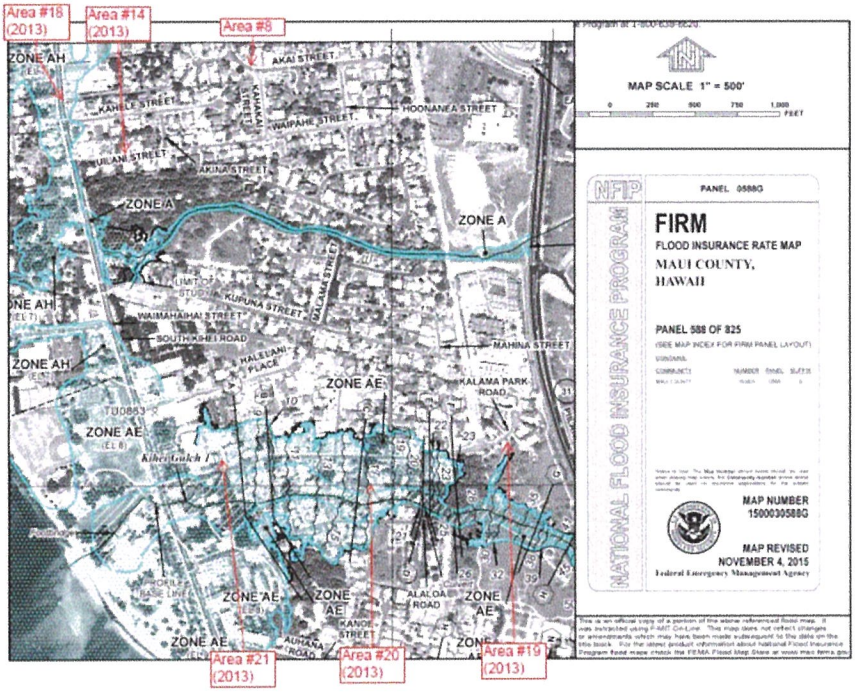
#9 Waipuilani Rd, Kihei
#15 South Kihei Rd, Kihei
#16 Uluniu Rd, Kihei



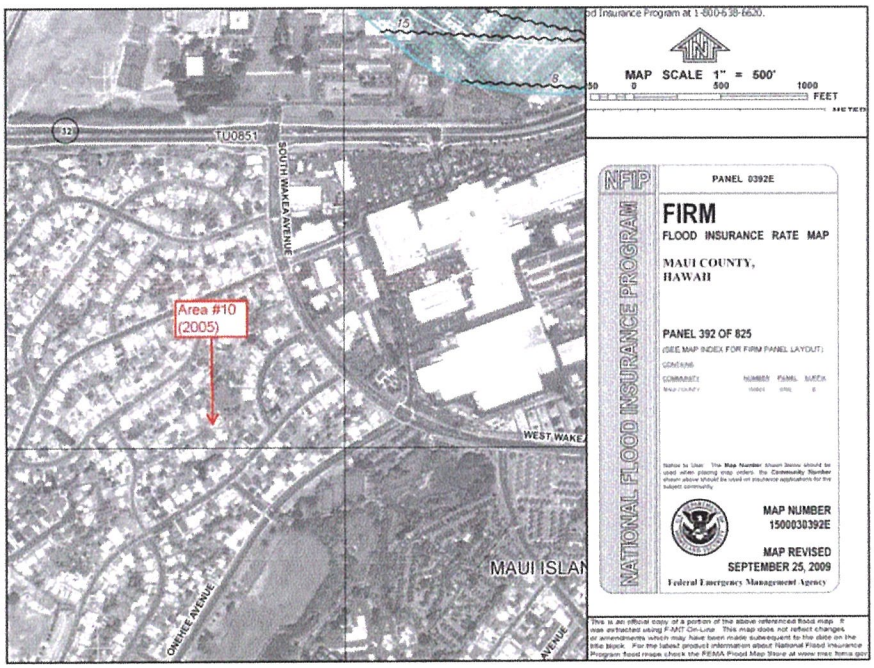
#7 West Welakahao St, Kihei
#17 South Kihei Rd, Kihei



#8 Akai St, Kihei
#14 Uilani St, Kihei
#18 South Kihei Rd, Kihei
#19 Alaloa Rd, Kihei
#20 Peke Pl, Kihei
#21 Keala Pl, Kihei



#10 Aleo Pl, Kahului



COUNTY OF MAUI
REPETITIVE LOSS PROPERTIES FLOODPLAIN MANAGEMENT PLAN
ANNUAL EVALUATION REPORT
SEPTEMBER 2016

INTRODUCTION:

On September 7, 2001 the Council of the County of Maui ("Council") adopted the County of Maui Repetitive Loss Properties Floodplain Management Plan ("Floodplain Management Plan") by Resolution No. 01-141 as a requirement to participate in the National Flood Insurance Program's Community Rating System. Resolution No. 01-141 requires that annual status reports be provided to the County Council on the implementation of the Floodplain Management Plan. The Floodplain Management Plan's Section 9 titled Action Plan provides six objectives to prevent the repetitive flooding problem from getting worse and assist property owners in protecting their residences and/or structures. The following evaluation of each objective will include the original objective, if the objective was accomplished, and if not, why the objective was not reached or why implementation has not taken place. The evaluation will also include recommendations for new projects or revised objectives.

STATUS ON ACTION PLAN:

1. "Floodplain Regulations: The County will amend its floodplain regulations to reduce the construction permitted before full compliance with flood standards is required. The current regulations allow the cost of construction to fifty percent of the existing value of the structure before compliance is required. The proposal is to change the threshold to ten percent over a five year period. The ordinance will be drafted for agencies' review by October 1, 2001. The ordinance should be transmitted to the County Council for adoption by December 1, 2001."

STATUS: The Federal Emergency Management Agency (FEMA) developed digital flood insurance rate maps (DFIRMs) for the County that became effective on September 25, 2009. Additionally on September 19, 2012 the County's DFIRMs were revised to include the statewide hurricane study. Also in 2009, Maui County Code Chapter 19.62, Flood Hazard Areas was updated by ordinance no. 3687 to meet FEMA requirements. The revised code limits existing nonconforming structures from improvements that would exceed fifty percent of the market value over any ten year period.

2. "Flood Maintenance: Maintenance of the area drainage systems by the County or respective property owners will be done. The County will record its maintenance activities. The property owners with private systems will be inspected on an annual basis prior to the hurricane season (June to November)."

STATUS: The County's drainage systems in the vicinity of the repetitive loss areas are regularly maintained. The property owners with individual drainage systems are inspected as part of our annual outreach program.

3. "Property protection: Repetitive loss property owners will be informed on the benefits of flood insurance, floodproofing and elevating nonconforming structures. The County will transmit copies of respective FEMA publications to the repetitive loss property owners."

STATUS: An annual outreach project notified each of the repetitive loss properties on issues on property protection. FEMA publications FEMA-312, Homeowner's Guide to Retrofitting, 1998 and FEMA-347, *Above the Flood: Elevating Your Floodprone House*, 2000 were previously sent to the affected property owners. The current FEMA P-312, Third Edition/June 30, 2014 and the *Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures*, FEMA P-259, Third Edition /January 1, 2012 are now available for download at http://www.fema.gov

4. "Emergency services: To improve the effectiveness of the 50 sirens for tsunami warnings (coastal flooding), the County is converting to 800mhz sirens. Since flash flooding for specific areas are difficult to predict, up-to-date information of storm activities is essential for the public's protection. Information will be disbursed on the National Oceanic Atmospheric Administration (NOAA) radio and auto alert (costing less than $80) to inform owners of pending flooding for the area. Also, the property owners will be informed of the National Weather Bureau (NWB) online informational services for flood watches and warnings. Owners will be informed annually on the above before the hurricane season (June to November)."

STATUS: The 800 MHZ siren conversion project has been completed. The annual outreach project informed the repetitive loss properties of the usage of the NOAA and NWB services.

5. "Structural projects: Property owners subject to coastal flooding should consider floodwalls as a structural means of protection provided the impacts of the floodwall are minimized or mitigated. In area no. 2, the proposed road widening project for Lower Honoapiilani Road will consider enlarging the culvert crossing. The desilting basin recently constructed directly above Honoapiilani Highway will be maintained to improve water quality and reduce the storm peak flow. In area no. 6, the County has initiated the projected ten year Lahaina Watershed Project to divert mauka storm flows to the unnamed gulch adjacent to Launiupoko Beach Park. Construction on its first phase will be initiated in the year 2002. A new storm drain system was constructed in area no. 7 in year 2000 and has improved the drainage for the area."

STATUS: The design of Phase 4 of the Lower Honoapiilani Road Improvements project in the vicinity of area no. 2 has been completed. The culvert crossing on Kaopala Gulch in the vicinity of area no. 2 (Napili) will be increased in size. Phase 4 has been delayed due to land acquisition and public opposition issues. Relative to area no. 6 (Lahaina Town), the construction of Phase II-B of the Lahaina Watershed project has been completed. Phase III-A of the Lahaina Watershed Project was completed in 2015. The remainder of the project which proceeds from Hokiokio Rd through Kauaula Stream toward Lahainaluna Road is on hold pending funding availability. Construction plans for Phase III-B, which extends the project to Kauaula Stream, are currently being finalized. Area no. 6 (Lahaina Town) will benefit from the Lahaina Watershed project after completion of Phase IV. Phase 4 of the Lower Honoapiilani Road Improvements continues to be on hold due to land acquisition and public opposition issues. For area #23 Hauoli St., we recently installed a new culvert crossing at Hauoli Street and a sediment settling basin mauka of Hauoli Street. In 2017, we plan to complete the installation of a new culvert crossing on South Kihei Road at Waiakoa Gulch. This is in areas #22 and #13. New injection drainage wells and a six and ten inch diameter drainage force main pump stands were installed in 2006 to area no. 10 (Kahului Sixth Increment) to mitigate the flooding at the end of Aleo Place.

6. "Public information: Flood information will be disbursed to the individual property owners and copies of various FEMA publications relative to floodproofing, insurance, etc. will also be included. Extra copies will be available to owners of properties subject to flooding."

STATUS: The above public information has been dispersed in our annual outreach project to the repetitive loss property owners since FY 2002. Our annual outreach this year included flood information on the individual properties and the importance of maintaining flood insurance.

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